As filed with the Securities and Exchange Commission on May 26, 2021

No. 333-255118

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Amendment No. 1 to
FORM S-4
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.*

(Exact name of registrant as specified in its charter)

Cayman Islands*	6770	98-1523768
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification No.)

1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Tel: (952) 456-5304
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Scott Leonard
1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Tel: (952) 456-5304
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies of all communications, including communications sent to agent for service, should be sent to:

Julian J. Seiguer, P.C. **Bryan D. Flannery** **Kirkland & Ellis LLP** **609 Main Street** **Houston, TX 77002** **Tel: (713) 836-3600**	**Warren M. Katz** **Karine Bilodeau** **Stikeman Elliott LLP** **1155 René-Lévesque Blvd. West,** **41st Floor** **Montréal, Quebec H3B 3V2** **Tel: (514) 397-3000**	**Michael L. Fantozzi. Esq.** **Jeffrey P. Schultz, Esq.** **Mintz, Levin, Cohn, Ferris,** **Glovsky and Popeo, P.C.** **One Financial Center** **Boston, Massachusetts 02111** **Tel: (617) 542-6000**

Approximate date of commencement of proposed sale to the public: As soon as practicable after this registration statement becomes effective and upon completion of the business combination.

If the securities being registered on this Form are being offered in connection with the formation of a holding company and there is compliance with General Instruction G, check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. ☐

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

If applicable, place an X in the box to designate the appropriate rule provision relied upon in conducting this transaction:

Exchange Act Rule 13e-4(i) (Cross-Border Issuer Tender Offer) ☐

Exchange Act Rule 14d-l(d) (Cross-Border Third-Party Tender Offer) ☐

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered[4]	Proposed Maximum Offering Price Per Unit	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee
TMC Common Shares[1]	37,500,000	$ 9.95[5]	$ 373,125,000	$ 40,707.94[9]
TMC Common Shares issuable upon exercise of warrants[2]	24,500,000	$ 11.50[6]	$ 281,750,000	$ 30,738.93[9]
Warrants to purchase TMC Common Shares[3]	24,500,000	$ 0.905[7]	$ 22,172,500	—[10]
Total				$ 71,446.87[11]

(1) The number of common shares of TMC (as defined below) being registered represents (i) 30,000,000 Class A ordinary shares (the "public shares") that were registered pursuant to the Registration Statement on Form S-1 (SEC File No. 333-237245) (the "IPO registration statement") and offered by SOAC (as defined below) in its initial public offering, (ii) 7,500,000 Class B ordinary shares (the "Class B Shares" and, together with the public shares, the "Ordinary Shares"). The identifying name for the Ordinary Shares will be changed to common shares of TMC (the "TMC Common Shares") as a result of the Continuance (as defined below).

(2) Represents TMC Common Shares to be issued upon the exercise of (i) 15,000,000 redeemable warrants (the "Public Warrants") to purchase Class A ordinary shares of SOAC that were registered pursuant to the IPO registration statement and offered by SOAC in its initial public offering and (ii) 9,500,000 warrants to purchase Class A ordinary shares of SOAC that were issued in a private placement concurrently with the initial public offering (the "Private Placement Warrants" and, together with the Public Warrants, the "Warrants"). The Warrants will automatically be converted by operation of law into warrants to acquire TMC Common Shares as a result of the Continuance.

(3) The number of warrants to acquire TMC Common Shares being registered represents (i) 15,000,000 Public Warrants and (ii) 9,500,000 Private Placement Warrants.

(4) Pursuant to Rule 416(a) of the Securities Act of 1933, as amended (the "Securities Act"), there are also being registered an indeterminable number of additional securities as may be issued to prevent dilution resulting from share splits, share dividends or similar transactions.

(5) Estimated solely for the purpose of calculating the registration fee, based on the average of the high and low prices of the Class A ordinary shares of SOAC (the entity to which TMC will succeed following the Continuance) on the New York Stock Exchange (the "NYSE") on April 6, 2021 ($9.95 per Class A ordinary share). April 6, 2021 was a recent date for which the reported high and low prices of the Class A ordinary shares of SOAC were available prior to the initial filing of this registration statement (such date being within five business days of the date that this registration statement was first filed with the Securities and Exchange Commission (the "SEC")). This calculation is in accordance with Rule 457(f)(1) of the Securities Act.

(6) Represents the exercise price of the Warrants.

(7) Estimated solely for the purpose of calculating the registration fee, based on the average of the high and low prices of the Public Warrants of SOAC (the entity to which TMC will succeed following the Continuance) on the NYSE on April 6, 2021 ($0.905 per Public Warrant). April 6, 2021 was a recent date for which the reported high and low prices of the Public Warrants of SOAC were available prior to the initial filing of this registration statement (such date being within five business days of the date that this registration statement was first filed with the SEC). This calculation is in accordance with Rule 457(f)(1) of the Securities Act.

(9) Calculated by multiplying the proposed maximum aggregate offering price of securities to be registered by 0.0001091.

(10) No registration fee is required pursuant to Rule 457(g) under the Securities Act.

(11) Previously paid.

* Immediately prior to the consummation of the Business Combination, Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company limited by shares ("SOAC"), intends to migrate to and be continued as a company existing under the laws of British Columbia, Canada (the "Continuance"). All securities being registered will be issued by the continuing entity following the Continuance, which will be renamed "TMC the metals company Inc.," as a result of the Continuance. As used herein, "TMC" refers to SOAC after giving effect to the Continuance. The SOAC securities to be issued to securityholders of DeepGreen Metals Inc. upon the consummation of the Business Combination will be issued pursuant to the exemption from registration provided by Section 3(a)(10) under the Securities Act.

The registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act or until this Registration Statement shall become effective on such date as the SEC, acting pursuant to said Section 8(a), may determine.

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The information in this preliminary proxy statement/prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is declared effective. This preliminary proxy statement/prospectus is not an offer to sell these securities nor a solicitation of an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

PRELIMINARY — SUBJECT TO COMPLETION, DATED MAY 26, 2021

PROXY STATEMENT FOR EXTRAORDINARY GENERAL MEETING OF SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
PROSPECTUS FOR
62,000,000 COMMON SHARES AND 24,500,000 WARRANTS OF SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
WHICH WILL BE RENAMED "TMC THE METALS COMPANY INC." AS A RESULT, AND UPON THE CONSUMMATION, OF THE CONTINUANCE AS A COMPANY EXISTING UNDER THE LAWS OF BRITISH COLUMBIA AS DESCRIBED HEREIN

The board of directors of Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company limited by shares ("SOAC"), has unanimously approved the transactions (collectively, the "Business Combination") contemplated by that certain Business Combination Agreement, dated March 4, 2021 (as may be amended, supplemented or otherwise modified from time to time, the "Business Combination Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub"), and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada ("DeepGreen"), a copy of which is attached to this proxy statement/prospectus as Annex A. As described in this proxy statement/prospectus, SOAC's shareholders are being asked to consider and vote upon the Continuance (as defined below), the Business Combination and other items. As used in this proxy statement/prospectus, "TMC" refers to SOAC after giving effect to the consummation of the Continuance.

Prior to the Effective Time (as defined below), SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company existing under the laws of British Columbia, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Part 9, Division 8 of the *Business Corporations Act* (British Columbia) (the "BCBCA") (such continuance, the "Continuance"). As a result and upon the consummation of the Continuance, (i) the identifying name of the Class A ordinary shares of SOAC, par value $0.0001 per share (the "Class A ordinary shares"), and Class B ordinary shares of SOAC, par value $0.0001 per share (the "Class B ordinary shares"), will be changed to common shares of TMC (the "TMC Common Shares") and the Class A ordinary shares and Class B ordinary shares will be changed from shares with par value to shares without par value; (ii) the rights and restrictions attached to the renamed Class A ordinary shares and Class B ordinary shares of SOAC will be deleted and the shares will have the rights and restrictions attached to the TMC Common Shares, as described in the notice of articles and articles of TMC; (iii) the number of authorized TMC Common Shares will be unlimited; (iv) each issued and outstanding whole warrant to purchase one Class A ordinary share will automatically represent the right to purchase one TMC Common Share at an exercise price of $11.50 per share on the terms and conditions set forth in the SOAC warrant agreement; (v) the notice of articles and articles of TMC will become the governing documents of SOAC; and (vi) SOAC's name will change to "TMC the metals company Inc."

On the Closing Date, promptly following the Continuance, pursuant to a court-approved plan of arrangement (the "Plan of Arrangement," and the arrangement pursuant to such Plan of Arrangement, the "Arrangement") under the BCBCA, (i) SOAC will acquire all of the issued and outstanding common shares in the capital of DeepGreen (the "DeepGreen Common Shares"); (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and options to purchase DeepGreen Common Shares, as applicable, an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the Effective Time (as defined below) of approximately $2.3 billion, (b) 5,000,000 Class A Special Shares, (c) 10,000,000 Class B Special Shares, (d) 10,000,000 Class C Special Shares, (e) 20,000,000 Class D Special Shares, (f) 20,000,000 Class E Special Shares, (g) 20,000,000 Class F Special Shares, (h) 25,000,000 Class G Special Shares, and (i) 25,000,000 Class H Special Shares, in each case, in the capital of TMC, each of which is automatically convertible into TMC Common Shares on a one for one basis (unless adjusted as described herein) if certain TMC Common Share price thresholds are met as described in this proxy statement/prospectus (collectively, the "DeepGreen Earnout Shares"), or, as applicable, options to purchase such TMC Common Shares and DeepGreen Earnout Shares upon the exercise of such options; (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, Canada. In addition, the Allseas Warrant (as defined herein) shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms. The time that the Arrangement becomes effective is referred to as the "Effective Time."

Immediately prior to the Effective Time, Sustainable Opportunities Holdings LLC, a Delaware limited liability company (the "Sponsor"), will exchange 741,000 TMC Common Shares for 500,000 Class I Special Shares (the "Class I Special Shares") and 741,000 Class J Special Shares, each of which is automatically convertible into TMC Common Shares on a one-for-one basis (unless adjusted as described herein), if certain TMC Common Share price thresholds are met as described in this proxy statement/prospectus (the "Class J Special Shares" and, together with the Class I Special Shares, the "Sponsor Earnout Shares" and, collectively with the DeepGreen Earnout Shares, the "TMC Special Shares").

In connection with the foregoing and concurrently with the execution of the Business Combination Agreement, SOAC entered into Subscription Agreements (the "Subscription Agreements") with certain investors (the "PIPE Investors"), pursuant to which the PIPE Investors have agreed to subscribe for and purchase, and SOAC has agreed to issue and sell to the PIPE Investors, an aggregate of 33,030,000 TMC Common Shares at a price of $10.00 per share, for aggregate gross proceeds of $330,300,000 (the "PIPE Financing"). The TMC Common Shares to be issued pursuant to the Subscription Agreements will not be registered under the Securities Act of 1933, as amended (the "Securities Act"), in reliance upon the exemption provided in Section 4(a)(2) of the Securities Act. SOAC will grant the PIPE Investors certain registration rights in connection with the PIPE Financing. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination.

It is anticipated that, upon completion of the Business Combination, (i) the holders of DeepGreen Common Shares (the "Existing DeepGreen Shareholders") and the holders of options to purchase DeepGreen Common Shares (assuming the exercise of such options) immediately prior to the Effective Time will own, collectively, approximately 76.7% of the outstanding TMC Common Shares and (ii) SOAC's initial shareholders will own approximately 2.3% of the outstanding TMC Common Shares, in each case, assuming that none of SOAC's outstanding public shares are redeemed in connection with the Business Combination, or approximately 85.3% and 2.5%, respectively, assuming that all of SOAC's outstanding public shares are redeemed in connection with the Business Combination. These percentages (i) assume that 230,600,000 TMC Common Shares are issued to Existing DeepGreen Shareholders and holders of options to purchase DeepGreen Common Shares, which would be the number of TMC Common Shares issued to these holders if the Adjusted Equity Value was approximately $2.3 billion as of immediately prior to the Effective Time; (ii) are based on 33,030,000 TMC Common Shares to be issued in the PIPE Financing; (iii) do not take into account any exercise of public warrants or private placement warrants to purchase TMC Common Shares that will be outstanding immediately following the Closing; (iv) do not take into account any TMC Common Shares underlying the Allseas Warrant (as defined herein), upon consummation of the Business Combination; and (v) do not take into account the conversion of any TMC Special Shares. "Adjusted Equity Value" under the Business Combination Agreement means the sum of (a) the Equity Value of $2.25 billion plus (b) the Aggregate Company Option Exercise Price (the aggregate exercise price that would be paid to DeepGreen in respect of all DeepGreen Options (whether vested or unvested) if such DeepGreen Options were exercised in full immediately prior to the Effective Time), plus (c) Net Group Company Cash (as defined in the Business Combination Agreement) immediately prior to the closing of the Business Combination. We have assumed $10 million of Net Group Company Cash at closing of the Business Combination, which would result in an approximately $2.306 billion Adjusted Equity Value and the issuance of 230,600,000 TMC Common Shares to Existing DeepGreen Shareholders and holders of DeepGreen Options. If the actual facts are different than these assumptions, the ownership percentages in TMC will be different.

This prospectus covers 62,000,000 TMC Common Shares (including 24,500,000 TMC Common Shares issuable upon exercise of the warrants) and 24,500,000 warrants to acquire TMC Common Shares to be issued as a result and upon the consummation of the Continuance.

SOAC's units, public shares and public warrants are currently listed on New York Stock Exchange (the "NYSE") under the symbols "SOAC.U," "SOAC" and "SOAC WS," respectively. SOAC will apply for listing, to be effective at the Effective Time, of TMC Common Shares and warrants on the Nasdaq Global Select Market ("NASDAQ") under the proposed symbols "TMC" and "TMC WS," respectively. SOAC will not have any units traded following closing of the Business Combination.

The accompanying proxy statement/prospectus provides shareholders of SOAC with detailed information about the Business Combination and other matters to be considered at the extraordinary general meeting of SOAC. We encourage you to read the entire accompanying proxy statement/prospectus, including the Annexes and other documents referred to therein, carefully and in their entirety. You should also carefully consider the risk factors described in "*Risk Factors*" beginning on page 47 of the accompanying proxy statement/prospectus.

We are not licensed to conduct investment business in the Cayman Islands by the Cayman Islands Monetary Authority and this proxy statement/prospectus does not constitute an offer to members of the public of our issued share capital, whether by way of sale or subscription, in the Cayman Islands. Our issued share capital have not been offered or sold, will not be offered or sold and no invitation to subscribe for our common shares will be made, directly or indirectly, to members of the public in the Cayman Islands.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES REGULATORY AGENCY HAS APPROVED OR DISAPPROVED THE TRANSACTIONS DESCRIBED

IN THE ACCOMPANYING PROXY STATEMENT/PROSPECTUS, PASSED UPON THE MERITS OR FAIRNESS OF THE BUSINESS COMBINATION OR RELATED TRANSACTIONS OR PASSED UPON THE ADEQUACY OR ACCURACY OF THE DISCLOSURE IN THE ACCOMPANYING PROXY STATEMENT/PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY CONSTITUTES A CRIMINAL OFFENSE.

The accompanying proxy statement/prospectus is dated , 2021, and is first being mailed to SOAC's shareholders on or about , 2021.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Tel: (952) 456-5304

Dear Shareholder:

You are cordially invited to attend the extraordinary general meeting (the "extraordinary general meeting") of Sustainable Opportunities Acquisitions Corp., a Cayman Islands exempted company limited by shares ("SOAC"), at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP located at 609 Main Street, Houston, TX 77002, and via a virtual meeting or at such other time, on such other date and at such other place to which the meeting may be adjourned.

As all shareholders will no doubt be aware, due to the current novel coronavirus ("COVID-19") global pandemic, there are restrictions in place in many jurisdictions relating to the ability to conduct in-person meetings. As part of our precautions regarding COVID-19, we are planning for the possibility that the meeting may be held virtually over the Internet, but the physical location of the meeting will remain at the location specified above for the purposes of our amended and restated memorandum and articles of association. If we take this step, we will announce the decision to do so via a press release and will post details on our website that will also be filed with the Securities Exchange Commission as proxy material.

As a registered shareholder, you received a Proxy Card from Continental Stock Transfer. The proxy statement contains instructions on how to attend the virtual extraordinary general meeting including the URL address, along with your control number. You will need your control number for access. If you do not have your control number, contact Continental Stock Transfer at the phone number or e-mail address below. Continental Stock Transfer contact information is as follows: 917-262-2373, or email *proxy@continentalstock.com*.

If we conduct the meeting virtually over the internet, you will be able to pre-register to attend the virtual meeting starting , 2021 at a.m. Eastern Time. Enter the URL address into your browser *https://www.cstproxy.com/soac/sm2021*, enter your control number, name and email address. Once you pre-register you will be able to vote or enter questions in the chat box. At the start of the meeting you will need to re-log in using your control number and will also be prompted to enter your control number if you vote during the meeting.

Beneficial investors, who own their investments through a bank or broker, will need to contact Continental Stock Transfer to receive a control number. If you plan to vote at the meeting you will need to have a legal proxy from your bank or broker or if you would like to join and not vote Continental will issue you a guest control number with proof of ownership. Either way you must contact Continental for specific instructions on how to receive the control number. We can be contacted at the number or email address above. Please allow up to 72 hours prior to the meeting for processing your control number.

If you do not have internet capabilities, you will be able to listen only to the meeting by dialing +1 877-770-3647 (toll-free), or outside the United States +1 312-780-0854 (standard rates apply). When prompted enter the pin number 40175015#. This is listen-only and you will not be able to vote or enter questions during the meeting.

At the extraordinary general meeting, SOAC shareholders will be asked to consider and vote upon a proposal, which is referred to herein as the "Business Combination Proposal" to approve and adopt the Business Combination Agreement (and the transactions contemplated thereby (such transactions collectively, the "Business Combination")), dated as of March 4, 2021 (as may be further amended, supplemented or otherwise modified from time to time, the "Business Combination Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub") and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada ("DeepGreen"), a copy of which is attached to this proxy statement/prospectus as Annex A.

As further described in the accompanying proxy statement/prospectus, subject to the terms and conditions of the Business Combination Agreement, the following transactions will occur:

(a) Prior to the Effective Time (as defined below), SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company existing under the laws of British Columbia, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and

Division 8 of Part 9 of the *Business Corporations Act* (British Columbia) (the "BCBCA") (such continuance, the "Continuance"). As a result and upon the consummation of the Continuance, (i) the identifying name of the Class A ordinary shares of SOAC, par value $0.0001 per share (the "Class A ordinary shares") and Class B ordinary shares of SOAC, par value $0.0001 per share (the "Class B ordinary shares") will be changed to common shares of TMC (the "TMC Common Shares") and the Class A ordinary shares and Class B ordinary shares will be changed from shares with par value to shares without par value; (ii) the rights and restrictions attaching to the renamed Class A ordinary shares and Class B ordinary shares of SOAC will be deleted and the shares will have the rights and restrictions attached to the TMC Common Shares, as described in the notice of articles and articles of TMC; (iii) the number of authorized TMC Common Shares will be unlimited; (iv) each issued and outstanding whole warrant to purchase one Class A ordinary share will automatically represent the right to purchase one TMC Common Share at an exercise price of $11.50 per share on the terms and conditions set forth in the SOAC warrant agreement; (v) the notice of articles and articles of TMC will become the governing documents of SOAC; and (vi) SOAC's name will change to "TMC the metals company Inc."

(b) On the Closing Date, promptly following the Continuance, pursuant to a court-approved plan of arrangement (the "Plan of Arrangement," and the arrangement pursuant to such Plan of Arrangement, the "Arrangement") under the BCBCA, (i) SOAC will acquire all of the issued and outstanding common shares in the capital of DeepGreen (the "DeepGreen Common Shares"); (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and options to purchase DeepGreen Common Shares (the "DeepGreen Options"), as applicable, the following shares or options to purchase the following shares: an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the Effective Time (as defined below) of approximately $2.3 billion; (b) 5,000,000 Class A Special Shares; (c) 10,000,000 Class B Special Shares; (d) 10,000,000 Class C Special Shares; (e) 20,000,000 Class D Special Shares; (f) 20,000,000 Class E Special Shares; (g) 20,000,000 Class F Special Shares; (h) 25,000,000 Class G Special Shares; and (i) 25,000,000 Class H Special Shares, in each case, in the capital of TMC, each of which is automatically convertible into TMC Common Shares on a one for one basis (unless adjusted as described herein) if certain TMC Common Share price thresholds are met as described in this proxy statement/prospectus (collectively, the "DeepGreen Earnout Shares"); (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, Canada. In addition, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms. The time that the Arrangement becomes effective is referred to as the "Effective Time."

In connection with the foregoing and concurrently with the execution of the Business Combination Agreement, SOAC entered into Subscription Agreements (the "Subscription Agreements") with certain investors (the "PIPE Investors"), pursuant to which the PIPE Investors have agreed to subscribe for and purchase, and SOAC has agreed to issue and sell to the PIPE Investors, an aggregate of 33,030,000 common shares, without par value, of TMC Common Shares at a price of $10.00 per share, for aggregate gross proceeds of $330,300,000 (the "PIPE Financing"). The TMC Common Shares to be issued pursuant to the Subscription Agreements will not be registered under the Securities Act of 1933, as amended (the "Securities Act"), in reliance upon the exemption provided in Section 4(a)(2) of the Securities Act. SOAC will grant the PIPE Investors certain registration rights in connection with the PIPE Financing. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination.

You will also be asked to consider and vote upon (a) a proposal to approve the adoption of the Continuance (the "Continuance Proposal"), (b) a proposal to approve and adopt the notice of articles and articles of TMC upon the Continuance (the "Charter Proposal"), (c) a proposal to approve, on a non-binding advisory basis, certain material differences between SOAC's existing amended and restated memorandum and articles of association (the "Existing Governing Documents") and the notice of articles and articles of TMC (the "Organizational Documents Proposals"); (d) a proposal to approve, for purposes of complying with New York Stock Exchange (the "NYSE") Listing Rule 312.03, the issuance of TMC Common Shares and securities convertible into or exchangeable for TMC Common Shares in connection with the Business Combination and the PIPE Financing, which is referred to herein as the "NYSE Proposal," (e) a proposal to approve and adopt the TMC Incentive Equity Plan, a copy of which is

attached to the accompanying proxy statement/prospectus as Annex D, which is referred to herein as the "Incentive Award Plan Proposal" and (f) a proposal to adjourn the extraordinary general meeting to a later date or dates to the extent necessary, which is referred to herein as the "Adjournment Proposal."

The Business Combination will be consummated only if the Continuance Proposal, the Business Combination Proposal, the Charter Proposal and the NYSE Proposal (collectively, the "Condition Precedent Proposals") are approved at the extraordinary general meeting. The Organizational Documents Proposal and the Adjournment Proposal are not conditioned upon the approval of any other proposal. Each of these proposals is more fully described in the accompanying proxy statement/prospectus, which each shareholder is encouraged to read carefully and in its entirety.

The Adjournment Proposal provides for a vote to adjourn the extraordinary general meeting to a later date or dates (a) to the extent necessary to ensure that any required supplement or amendment to the accompanying proxy statement/prospectus is provided to SOAC shareholders or, if as of the time for which the extraordinary general meeting is scheduled, there are insufficient SOAC ordinary shares represented (either in person or by proxy) to constitute a quorum necessary to conduct business at the extraordinary general meeting or (b) in order to solicit additional proxies from SOAC shareholders in favor of one or more of the proposals at the extraordinary general meeting.

In connection with the Business Combination, certain related agreements have been, or will be entered into on or prior to the closing of the Business Combination, including the Transaction Support Agreements, the Amended and Restated Registration Rights Agreement, and the Sponsor Letter Agreement (each as defined in the accompanying proxy statement/prospectus). See "*Business Combination Proposal — Related Agreements*" in the accompanying proxy statement/prospectus for more information.

Pursuant to the Existing Governing Documents, a holder of SOAC's public shares (a "public shareholder") may request that SOAC redeem all or a portion of such public shares for cash if the Business Combination is consummated. Holders of units must elect to separate the units into the underlying public shares and warrants prior to exercising redemption rights with respect to the public shares. If holders hold their units in an account at a brokerage firm or bank, holders must notify their broker or bank that they elect to separate the units into the underlying public shares and warrants, or if a holder holds units registered in its own name, the holder must contact Continental Stock Transfer & Trust Company ("Continental"), SOAC's transfer agent, directly and instruct it to do so. The redemption rights include the requirement that a holder must identify itself in writing as a beneficial holder and provide its legal name, phone number and address to Continental in order to validly redeem its shares. **Public shareholders are not required to affirmatively vote for or against the Business Combination Proposal or any of the other proposals set forth in the accompanying proxy statement/prospectus in order to redeem their public shares for cash. This means that public shareholders (other than those who have agreed not to do so by executing the Sponsor Letter Agreement) who hold public shares on or before , 2021 (two (2) business days before the extraordinary general meeting) may elect to redeem their public shares whether or not they are holders as of the record date, and whether or not they vote "FOR" the Business Combination Proposal or any of the other proposals set forth in the accompanying proxy statement/prospectus.** If the Business Combination is not consummated, the public shares will be returned to the respective holder, broker or bank. If the Business Combination is consummated, and if a public shareholder properly exercises its right to redeem all or a portion of the public shares that it holds and timely delivers its shares to Continental, TMC will redeem such public shares for a per-share price, payable in cash, equal to the pro rata portion of the trust account established at the consummation of SOAC's initial public offering, calculated as of two business days prior to the consummation of the Business Combination. For illustrative purposes, as of , 2021, this would have amounted to approximately $ per issued and outstanding public share. If a public shareholder exercises its redemption rights in full, then it will be electing to exchange its public shares for cash and will no longer own public shares. The redemption will take place following the Continuance and, accordingly, it is TMC Common Shares that will be redeemed immediately after consummation of the Business Combination. See "*Extraordinary General Meeting of SOAC — Redemption Rights*" in the accompanying proxy statement/prospectus for a detailed description of the procedures to be followed if you wish to redeem your public shares for cash.

Notwithstanding the foregoing, a public shareholder, together with any affiliate of such public shareholder or any other person with whom such public shareholder is acting in concert or as a "group" (as defined in Section 13(d)(3) of the Securities Exchange Act of 1934, as amended (such act, the "Exchange Act")), will be

restricted from redeeming its public shares with respect to more than an aggregate of 15% of the public shares. Accordingly, if a public shareholder, alone or acting in concert or as a group, seeks to redeem more than 15% of the public shares, then any such shares in excess of that 15% limit would not be redeemed for cash.

Sponsor and each of Rick Gaenzle, Isaac Barchas and Justin Kelly (collectively, the "initial shareholders") have, pursuant to the Sponsor Letter Agreement, agreed to, among other things, vote all of their ordinary shares in favor of the proposals being presented at the extraordinary general meeting and waive their anti-dilution rights with respect to their Class B ordinary shares in connection with the consummation of the Business Combination. Such shares will be excluded from the pro rata calculation used to determine the per-share redemption price. As of the date of the accompanying proxy statement/prospectus, the initial shareholders own approximately 20% of the issued and outstanding ordinary shares. See "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*" in the accompanying proxy statement/prospectus for more information related to the Sponsor Letter Agreement.

The Business Combination Agreement is subject to the satisfaction or waiver of certain other closing conditions as described in the accompanying proxy statement/prospectus. There can be no assurance that the parties to the Business Combination Agreement would waive any such provision of the Business Combination Agreement. In addition, in no event will SOAC redeem public shares in an amount that would cause TMC's net tangible assets (as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act) to be less than $5,000,001 after giving effect to the transactions contemplated by the Business Combination Agreement and the PIPE Financing.

SOAC is providing the accompanying proxy statement/prospectus and proxy card to SOAC's shareholders in connection with the solicitation of proxies to be voted at the extraordinary general meeting and at any adjournments of the extraordinary general meeting. Information about the extraordinary general meeting, the Business Combination and other related business to be considered by SOAC's shareholders at the extraordinary general meeting is included in the accompanying proxy statement/prospectus. **Whether or not you plan to attend the extraordinary general meeting, all of SOAC's shareholders are urged to read the accompanying proxy statement/prospectus, including the Annexes and other documents referred to therein, carefully and in their entirety. You should also carefully consider the risk factors described in "*Risk Factors*" beginning on page 47 of the accompanying proxy statement/prospectus**.

After careful consideration, the board of directors of SOAC has unanimously approved the Business Combination Agreement and the transactions contemplated thereby, and unanimously recommends that shareholders vote "FOR" the adoption of the Business Combination Agreement and approval of the transactions contemplated thereby, and "FOR" all other proposals presented to SOAC's shareholders in the accompanying proxy statement/prospectus. When you consider the recommendation of these proposals by the board of directors of SOAC, you should keep in mind that SOAC's directors and officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" in the accompanying proxy statement/prospectus for a further discussion of these considerations.

The approval of each of the Continuance Proposal and the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. The approval of each of the Business Combination Proposal, the NYSE Proposal and the Incentive Award Plan Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. The Organizational Documents Proposals are voted on a non-binding advisory basis.

Your vote is very important. **Whether or not you plan to attend the extraordinary general meeting, please vote as soon as possible by following the instructions in the accompanying proxy statement/prospectus to make sure that your shares are represented at the extraordinary general meeting. If you hold your shares in "street name" through a bank, broker or other nominee, you will need to follow the instructions provided to you by your bank, broker or other nominee to ensure that your shares are represented and voted at the extraordinary general meeting. The Business Combination will be consummated only if the Condition**

Precedent Proposals are approved at the extraordinary general meeting. Each of the Condition Precedent Proposals is cross-conditioned on the approval of each other. The Adjournment Proposal is not conditioned on the approval of any other proposal set forth in the accompanying proxy statement/prospectus.

If you sign, date and return your proxy card without indicating how you wish to vote, your proxy will be voted "FOR" each of the proposals presented at the extraordinary general meeting. If you fail to return your proxy card or fail to instruct your bank, broker or other nominee how to vote, and do not attend the extraordinary general meeting in person, the effect will be, among other things, that your shares will not be counted for purposes of determining whether a quorum is present at the extraordinary general meeting. If you are a shareholder of record and you attend the extraordinary general meeting and wish to vote in person, you may withdraw your proxy and vote in person.

TO EXERCISE YOUR REDEMPTION RIGHTS, YOU MUST DEMAND IN WRITING THAT YOUR PUBLIC SHARES ARE REDEEMED FOR A PRO RATA PORTION OF THE FUNDS HELD IN THE TRUST ACCOUNT AND TENDER YOUR SHARES TO SOAC'S TRANSFER AGENT AT LEAST TWO BUSINESS DAYS PRIOR TO THE VOTE AT THE EXTRAORDINARY GENERAL MEETING. IN ORDER TO EXERCISE YOUR REDEMPTION RIGHT, YOU NEED TO IDENTIFY YOURSELF AS A BENEFICIAL HOLDER AND PROVIDE YOUR LEGAL NAME, PHONE NUMBER AND ADDRESS IN YOUR WRITTEN DEMAND. YOU MAY TENDER YOUR SHARES BY EITHER DELIVERING YOUR SHARE CERTIFICATE TO THE TRANSFER AGENT OR BY DELIVERING YOUR SHARES ELECTRONICALLY USING THE DEPOSITORY TRUST COMPANY'S DWAC (DEPOSIT WITHDRAWAL AT CUSTODIAN) SYSTEM. IF THE BUSINESS COMBINATION IS NOT COMPLETED, THEN THESE SHARES WILL BE RETURNED TO YOU OR YOUR ACCOUNT. IF YOU HOLD THE SHARES IN STREET NAME, YOU WILL NEED TO INSTRUCT THE ACCOUNT EXECUTIVE AT YOUR BANK OR BROKER TO WITHDRAW THE SHARES FROM YOUR ACCOUNT IN ORDER TO EXERCISE YOUR REDEMPTION RIGHTS.

On behalf of the SOAC Board, I would like to thank you for your support and look forward to the successful completion of the Business Combination.

Sincerely,

Scott Honour
Chairman of the Board of Directors

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES REGULATORY AGENCY HAS APPROVED OR DISAPPROVED THE TRANSACTIONS DESCRIBED IN THE ACCOMPANYING PROXY STATEMENT/PROSPECTUS, PASSED UPON THE MERITS OR FAIRNESS OF THE BUSINESS COMBINATION OR RELATED TRANSACTIONS OR PASSED UPON THE ADEQUACY OR ACCURACY OF THE DISCLOSURE IN THE ACCOMPANYING PROXY STATEMENT/PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY CONSTITUTES A CRIMINAL OFFENSE.

The accompanying proxy statement/prospectus is dated , 2021 and is first being mailed to shareholders on or about , 2021.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Tel: (952) 456-5304

NOTICE OF EXTRAORDINARY GENERAL MEETING
TO BE HELD ON , 2021

TO THE SHAREHOLDERS OF SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.:

NOTICE IS HEREBY GIVEN that an extraordinary general meeting of the shareholders (the "extraordinary general meeting") of Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company limited by shares ("SOAC"), will be held at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP located at 609 Main Street, Houston, Texas 77002, and via a virtual meeting or at such other date and at such other place to which the meeting may be adjourned.

As all shareholders will no doubt be aware, due to the current novel coronavirus ("COVID-19") global pandemic, there are restrictions in place in many jurisdictions relating to the ability to conduct in-person meetings. As part of our precautions regarding COVID-19, we are planning for the possibility that the meeting may be held virtually over the Internet, but the physical location of the meeting will remain at the location specified above for the purposes of our amended and restated memorandum and articles of association. If we take this step, we will announce the decision to do so via a press release and will post details on our website that will also be filed with the Securities Exchange Commission as proxy material. You are cordially invited to attend the extraordinary general meeting, which will be held for the following purposes:

- **Proposal No. 1 — The Continuance Proposal** — **RESOLVED**, as a special resolution, that in connection with the transactions (such transactions, collectively, the "Business Combination") contemplated by that certain Business Combination Agreement, dated March 4, 2021 (as may be amended, supplemented or otherwise modified from time to time, the "Business Combination Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub") and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada ("DeepGreen"), a copy of which is attached to this proxy statement/prospectus as Annex A, SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company existing under the laws of British Columbia, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Part 9, Division 8 of the *Business Corporations Act* (British Columbia) (the "BCBCA") (such continuance, the "Continuance"). The form of notice and articles of TMC (the "TMC Notice and Articles") are attached to this proxy statement/prospectus as Annex B and Annex C, respectively.

- **Proposal No. 2 — The Business Combination Proposal** — **RESOLVED**, as an ordinary resolution, that SOAC's entry into the Business Combination Agreement, pursuant to which, among other things, on the Closing Date, promptly following the Continuance, (A) pursuant to a court-approved plan of arrangement (the "Plan of Arrangement," and the arrangement pursuant to such Plan of Arrangement, the "Arrangement") under the BCBCA, (i) SOAC will acquire all of the issued and outstanding common shares in the capital of DeepGreen (the "DeepGreen Common Shares"); (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and options to purchase DeepGreen Common Shares (the "DeepGreen Options"), as applicable, the following shares or options to purchase the shares: an aggregate of (a) 230,600,000 common shares in the capital of TMC ("TMC Common Shares"), assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the effective time of approximately $2.3 billion; (b) 5,000,000 Class A Special Shares; (c) 10,000,000 Class B Special Shares; (d) 10,000,000 Class C Special Shares; (e) 20,000,000 Class D Special Shares; (f) 20,000,000 Class E Special Shares; (g) 20,000,000 Class F Special Shares; (h) 25,000,000 Class G Special Shares; and (i) 25,000,000 Class H Special Shares, in each case, in the capital of TMC, each of which is automatically convertible into TMC Common Shares on a one for one basis (unless adjusted as described herein) if certain TMC Common Share price thresholds are met as described in this proxy statement/prospectus (collectively, the

"DeepGreen Earnout Shares"), (iii) DeepGreen will become a wholly-owned subsidiary of TMC, and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, Canada, and (B) the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement and certain related agreements (including the Subscription Agreements, the Transaction Support Agreements, the Sponsor Letter Agreement and the Amended and Restated Registration Rights Agreement, each in the form attached to the proxy statement/prospectus as Annex E, Annex F, Annex G and Annex H, respectively), and the transactions contemplated thereby, be approved, ratified and confirmed in all respects.

- **Proposal No. 3 — The Charter Proposal** — **RESOLVED,** as a result of and upon the consummation of the Continuance, as a special resolution, that the TMC Notice and Articles become, in replacement of the Existing Governing Documents (as defined below), the governing documents of TMC, including the change in authorized share capital and change of name of Sustainable Opportunities Acquisition Corp. to TMC the metals company Inc., each as reflected in the TMC Notice and Articles.

- **Proposal No. 4 — The Organizational Documents Proposals** — to consider and vote upon, on a non-binding basis, certain governance provisions in the TMC Notice and Articles, to approve the following material differences between the current amended and restated memorandum and articles of association of SOAC (the "Existing Governing Documents") and the TMC Notice and Articles:

  - **Organizational Documents Proposal 4A —** the establishment of the authorized capital of TMC to consist of (i) an unlimited number of common shares, (ii) an unlimited number of preferred shares, issuable in series, and (iii) the TMC Special Shares, in each case, without par value (this proposal is referred to herein as "Organizational Documents Proposal 4A").

  - **Organizational Documents Proposal 4B —** the declassification of the board of directors with the result being that each director will be elected on an annual basis (this proposal is referred to herein as "Organizational Documents Proposal 4B").

  - **Organizational Documents Proposal 4C —** the reduction of the requisite quorum for a meeting of shareholders from a majority to at least two shareholders representing no less than one-third ($33^{1/3}$%) of the shares entitled to vote at such meeting (this proposal is referred to herein as "Organizational Documents Proposal 4C").

  - **Organizational Documents Proposal 4D —** the inclusion of an advance notice provision that requires a shareholder to provide notice to TMC in advance of a meeting of shareholders should such shareholder wish to nominate a person for election to the board of directors (this proposal is referred to herein as "Organizational Documents Proposal 4D").

  - **Organizational Documents Proposal 4E —** the inclusion of a forum selection provision whereby, subject to limited exceptions, or unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada, and the appellate courts therefrom, will be the sole and exclusive forum for certain shareholder litigation matters (this proposal is referred to herein as "Organizational Documents Proposal 4E").

  - **Organizational Documents Proposal 4F —** certain other changes, including the changes in the rights and restrictions attached to the Class B ordinary shares, and the deletion of the provisions relating to the initial public offering, the Sponsors, the initial business combination and other related matters (this proposal is referred to herein as "Organizational Documents Proposal 4F").

- **Proposal No. 5 — The NYSE Proposal** — **RESOLVED**, as an ordinary resolution, that for the purposes of complying with the applicable provisions of New York Stock Exchange ("NYSE") Listing Rule 312.03, the issuance of TMC Common Shares and securities convertible into or exchangeable for TMC Common Shares in connection with the Business Combination and the PIPE Financing be approved.

- **Proposal No. 6 — The Incentive Award Plan Proposal** — **RESOLVED**, as an ordinary resolution, that the TMC Incentive Equity Plan, a copy of which is attached to the accompanying proxy statement/prospectus as Annex D, be adopted and approved.

- **Proposal No. 7 — The Adjournment Proposal** — **RESOLVED**, as an ordinary resolution, that the adjournment of the extraordinary general meeting to a later date or dates (A) to the extent necessary to ensure that any required supplement or amendment to the proxy statement/prospectus is provided to SOAC shareholders or, if as of the time for which the extraordinary general meeting is scheduled, there are insufficient SOAC ordinary shares represented (either in person or by proxy) to constitute a quorum necessary to conduct business at the extraordinary general meeting or (B) in order to solicit additional proxies from SOAC shareholders in favor of one or more of the proposals at the extraordinary general meeting be approved.

These items of business are described in this proxy statement/prospectus, which we encourage you to read carefully and in its entirety before voting.

Only holders of record of ordinary shares at the close of business on , 2021 are entitled to notice of and to vote and have their votes counted at the extraordinary general meeting and any adjournment of the extraordinary general meeting.

This proxy statement/prospectus and accompanying proxy card is being provided to SOAC's shareholders in connection with the solicitation of proxies to be voted at the extraordinary general meeting and at any adjournment of the extraordinary general meeting. **Whether or not you plan to attend the extraordinary general meeting, all of SOAC's shareholders are urged to read this proxy statement/prospectus, including the Annexes and the documents referred to herein carefully and in their entirety. You should also carefully consider the risk factors described in "*Risk Factors*" beginning on page 47 of this proxy statement/prospectus.**

After careful consideration, the board of directors of SOAC has unanimously approved the Business Combination Agreement and the transactions contemplated thereby, and unanimously recommends that shareholders vote "FOR" the adoption of the Business Combination Agreement and approval of the transactions contemplated thereby, and "FOR" all other proposals presented to SOAC's shareholders in the accompanying proxy statement/prospectus. When you consider the recommendation of these proposals by the board of directors of SOAC, you should keep in mind that SOAC's directors and officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" in the accompanying proxy statement/prospectus for a further discussion of these considerations.

Pursuant to the Existing Governing Documents, a public shareholder may request of SOAC that TMC redeem all or a portion of their public shares for cash if the Business Combination is consummated. As a holder of public shares, you will be entitled to receive cash for any public shares to be redeemed only if you:

(i) (a) hold public shares, or (b) if you hold public shares through units, you elect to separate your units into the underlying public shares and warrants prior to exercising your redemption rights with respect to the public shares;

(ii) submit a written request to Continental Stock Transfer & Trust Company ("Continental"), SOAC's transfer agent, in which you (a) request that SOAC redeem all or a portion of your public shares for cash and (b) identify yourself as the beneficial holder of the public shares and provide your legal name, phone number and address; and

(iii) deliver your public shares to Continental, SOAC's transfer agent, physically or electronically through The Depository Trust Company.

Holders must complete the procedures for electing to redeem their public shares in the manner described above prior to 5:00 p.m., Eastern Time, on , 2021 (two business days before the extraordinary general meeting) in order for their shares to be redeemed.

Holders of units must elect to separate the units into the underlying public shares and warrants prior to exercising redemption rights with respect to the public shares. If holders hold their units in an account at a brokerage firm or bank, holders must notify their broker or bank that they elect to separate the units into the underlying public shares and warrants, or if a holder holds units registered in its own name, the holder must contact Continental, SOAC's transfer agent, directly and instruct them to do so. The redemption rights include the requirement that a holder must identify itself in writing as a beneficial holder and provide its legal name, phone number and address to Continental in order to validly redeem its shares. **Public shareholders are not required to affirmatively vote for or against the Business Combination Proposal or any of the other proposals set forth in the accompanying proxy statement/prospectus in order to redeem their public shares for cash. This means that public shareholders (other than those who have agreed not to do so by executing the Sponsor Letter Agreement) who hold public shares on or before , 2021 (two (2) business days before the extraordinary general meeting) may elect to redeem their public shares whether or not they are holders as of the record date, and whether or not they vote "FOR" the Business Combination Proposal or any of the other proposals set forth in the accompanying proxy statement/prospectus.** If the Business Combination is consummated, and if a public shareholder properly exercises its right to redeem all or a portion of the public shares that it holds and timely delivers its shares to Continental, SOAC's transfer agent, TMC will redeem such public shares for a per-share price, payable in cash, equal to the pro rata portion of the trust account established at the consummation of SOAC's initial public offering (such account, the "trust account"), calculated as of two business days prior to the consummation of the Business Combination. For illustrative purposes, as of , 2021, this would have amounted to approximately $ per issued and outstanding public share. If a public shareholder exercises its redemption rights in full, then it will be electing to exchange its public shares for cash and will no longer own public shares. The redemption will take place following the Continuance and, accordingly, it is shares of TMC that will be redeemed immediately after consummation of the Business Combination. See "*Extraordinary General Meeting of SOAC*" in this proxy statement/prospectus for a detailed description of the procedures to be followed if you wish to redeem your public shares for cash.

Notwithstanding the foregoing, a public shareholder, together with any affiliate of such public shareholder or any other person with whom such public shareholder is acting in concert or as a "group" (as defined in Section 13(d)(3) of the Securities Exchange Act of 1934, as amended ("Exchange Act")), will be restricted from redeeming its public shares with respect to more than an aggregate of 15% of the public shares. Accordingly, if a public shareholder, alone or acting in concert or as a group, seeks to redeem more than 15% of the public shares, then any such shares in excess of that 15% limit would not be redeemed for cash.

The initial shareholders have, pursuant to the Sponsor Letter Agreement, agreed to, among other things, vote all of their ordinary shares in favor of the proposals being presented at the extraordinary general meeting and waive their anti-dilution rights with respect to their Class B ordinary shares in connection with the consummation of the Business Combination. Such shares will be excluded from the pro rata calculation used to determine the per-share redemption price. As of the date of this proxy statement/prospectus, the initial shareholders own approximately 20% of the issued and outstanding ordinary shares. See "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*" in the accompanying proxy statement/prospectus for more information related to the Sponsor Letter Agreement.

The Business Combination Agreement is subject to the satisfaction or waiver of certain other closing conditions as described in the accompanying proxy statement/prospectus. There can be no assurance that the parties to the Business Combination Agreement would waive any such provision of the Business Combination Agreement. In addition, in no event will SOAC redeem public shares in an amount that would cause TMC's net tangible assets (as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act) to be less than $5,000,001 after giving effect to the transactions contemplated by the Business Combination Agreement and the PIPE Financing.

The approval of each of the Continuance Proposal and the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. The approval of each of the Business Combination Proposal, the NYSE Proposal and the Incentive Award Plan Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. The Organizational Documents Proposals are voted on a non-binding advisory basis.

Your vote is very important. **Whether or not you plan to attend the extraordinary general meeting, please vote as soon as possible by following the instructions in the accompanying proxy statement/prospectus to make sure that your shares are represented at the extraordinary general meeting. If you hold your shares in "street name" through a bank, broker or other nominee, you will need to follow the instructions provided to you by your bank, broker or other nominee to ensure that your shares are represented and voted at the extraordinary general meeting. The Business Combination will be consummated only if the Condition Precedent Proposals are approved at the extraordinary general meeting. Each of the Condition Precedent Proposals is cross-conditioned on the approval of each other. The Adjournment Proposal is not conditioned on the approval of any other proposal set forth in the accompanying proxy statement/prospectus.**

If you sign, date and return your proxy card without indicating how you wish to vote, your proxy will be voted "FOR" each of the proposals presented at the extraordinary general meeting. If you fail to return your proxy card or fail to instruct your bank, broker or other nominee how to vote, and do not attend the extraordinary general meeting in person, the effect will be, among other things, that your shares will not be counted for purposes of determining whether a quorum is present at the extraordinary general meeting. If you are a shareholder of record and you attend the extraordinary general meeting and wish to vote in person, you may withdraw your proxy and vote in person.

Your attention is directed to the remainder of the proxy statement/prospectus following this notice (including the Annexes and other documents referred to herein) for a more complete description of the proposed Business Combination and related transactions and each of the proposals. You are encouraged to read this proxy statement/prospectus carefully and in its entirety, including the Annexes and other documents referred to herein. If you have any questions or need assistance voting your ordinary shares, please contact Morrow Sodali LLC, our proxy solicitor, by calling (800) 662-5200, or banks and brokers can call collect at (203) 658-9400, or by emailing SOAC.info@investor.morrowsodali.com.

Thank you for your participation. We look forward to your continued support.

By Order of the Board of Directors of Sustainable Opportunities Acquisition Corp.,

Sincerely,

Scott Honour
Chairman of the Board of Directors

TO EXERCISE YOUR REDEMPTION RIGHTS, YOU MUST DEMAND IN WRITING THAT YOUR PUBLIC SHARES ARE REDEEMED FOR A PRO RATA PORTION OF THE FUNDS HELD IN THE TRUST ACCOUNT AND TENDER YOUR SHARES TO SOAC'S TRANSFER AGENT AT LEAST TWO BUSINESS DAYS PRIOR TO THE VOTE AT THE EXTRAORDINARY GENERAL MEETING. IN ORDER TO EXERCISE YOUR REDEMPTION RIGHT, YOU NEED TO IDENTIFY YOURSELF AS A BENEFICIAL HOLDER AND PROVIDE YOUR LEGAL NAME, PHONE NUMBER AND ADDRESS IN YOUR WRITTEN DEMAND. YOU MAY TENDER YOUR SHARES BY EITHER DELIVERING YOUR SHARE CERTIFICATE TO THE TRANSFER AGENT OR BY DELIVERING YOUR SHARES ELECTRONICALLY USING THE DEPOSITORY TRUST COMPANY'S DWAC (DEPOSIT WITHDRAWAL AT CUSTODIAN) SYSTEM. IF THE BUSINESS COMBINATION IS NOT COMPLETED, THEN THESE SHARES WILL BE RETURNED TO YOU OR YOUR ACCOUNT. IF YOU HOLD THE SHARES IN STREET NAME, YOU WILL NEED TO INSTRUCT THE ACCOUNT EXECUTIVE AT YOUR BANK OR BROKER TO WITHDRAW THE SHARES FROM YOUR ACCOUNT IN ORDER TO EXERCISE YOUR REDEMPTION RIGHTS.

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ADDITIONAL INFORMATION

You may request copies of this proxy statement/prospectus and any other publicly available information concerning SOAC, without charge, by written request to Sustainable Opportunities Acquisition Corp. 1601 Bryan Street, Suite 4141, Dallas, Texas 75201, or by telephone request at (952) 456-5304; or Morrow Sodali LLC, our proxy solicitor, by calling (800) 622-5200, or banks and brokers can call collect at (203) 658-9400, or by emailing *SOAC.info@investor.morrowsdali.com* or from the SEC through the SEC website at *http://www.sec.gov.*

In order for SOAC's shareholders to receive timely delivery of the documents in advance of the extraordinary general meeting of SOAC to be held on , 2021, you must request the information no later than five business days prior to the date of the extraordinary general meeting, by , 2021.

TRADEMARKS

This document contains references to trademarks, trade names and service marks belonging to other entities. Solely for convenience, trademarks, trade names and service marks referred to in this proxy statement/prospectus may appear without the ® or TM symbols, but such references are not intended to indicate, in any way, that the applicable licensor will not assert, to the fullest extent under applicable law, its rights to these trademarks and trade names. We do not intend our use or display of other companies' trade names, trademarks or service marks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

SELECTED DEFINITIONS

Unless otherwise stated in this proxy statement/prospectus or the context otherwise requires, references to:

- "***Aggregate Transaction Proceeds***" are to the aggregate cash proceeds to be received by SOAC from the trust account in connection with the Business Combination, together with the aggregate gross proceeds from the PIPE Financing.
- "***Aggregate Transaction Proceeds Condition***" are to the condition in the Business Combination Agreement that the Aggregate Transaction Proceeds must be an amount equal to no less than $250,000,000 after deducting SOAC's unpaid expenses, liabilities, and any amounts paid to SOAC shareholders that exercise their redemption rights in connection with the Business Combination.
- ***"Allseas"*** are to Allseas Group S.A.
- ***"Allseas Warrant"*** are to the warrant issued by DeepGreen to Allseas to purchase DeepGreen Common Shares, which shall vest upon certain milestones into such number of shares that is based on the formula described therein, and which shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms;
- "***Arrangement***" are to an arrangement under Part 9, Division 5 of the BCBCA on the terms and subject to the conditions set forth in the Plan of Arrangement;
- "***Articles of Association***" are to the amended and restated articles of association of SOAC;
- "***BCBCA***" are to the *Business Corporations Act* (British Columbia);
- "***Business Combination***" are to the transactions contemplated by the Business Combination Agreement, collectively, including the PIPE Financing;
- "***Business Combination Agreement***" are to that certain Business Combination Agreement, dated as of March 4, 2021, by and among SOAC, NewCo Sub and DeepGreen, as may be amended, supplemented or otherwise modified from time to time;
- "***Cayman Islands Companies Law***" are to the Companies Act (as Revised) of the Cayman Islands as the same may be amended from time to time;
- "***Class A ordinary shares***" are to the Class A ordinary fully paid shares, par value $0.0001 per share, of SOAC, which will automatically be redesignated as TMC Common Shares as a result and upon the consummation of the Continuance;
- "***Class B ordinary shares***" or "***Founder Shares***" are to the Class B fully paid ordinary shares, par value $0.0001 per share, of SOAC outstanding as of the date of this proxy statement/prospectus that were initially issued to our Sponsor in a private placement prior to our initial public offering, and of which 90,000 were transferred to Messrs. Gaenzle, Barchas and Kelly in March 2020, which will automatically be redesignated as TMC Common Shares as a result and upon the consummation of the Continuance;
- "***Closing***" are to the closing of the Business Combination;
- "***Closing Date***" are to that date that is in no event later than the third (3rd) business day, following the satisfaction (or, to the extent permitted by applicable law, waiver) of the conditions described under the section entitled "*Business Combination Proposal — The Business Combination Agreement — Conditions to Closing of the Business Combination*," (other than those conditions that by their nature are to be satisfied at the Closing, but subject to satisfaction or waiver of such conditions) or at such other date as SOAC and DeepGreen may agree in writing;
- "***Condition Precedent Proposals***" are to the Continuance Proposal, the Business Combination Proposal, the Charter Proposal and the NYSE Proposal, collectively;
- "***Continental***" are to Continental Stock Transfer & Trust Company;

- "***Continuance***" are to SOAC's migration and continuance from the Cayman Islands to British Columbia, Canada and domestication as a company existing under the laws of British Columbia, Canada, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Part 9, Division 8 of the BCBCA;
- "***Court***" are to the Supreme Court of British Columbia;
- "***DeepGreen***" are to DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada, prior to the consummation of the Arrangement and the Business Combination;
- "***DeepGreen Arrangement Resolution***" are to the special resolution of the holders of DeepGreen Common Shares, DeepGreen Preferred Shares and DeepGreen Options in respect of the Arrangement to be considered at the DeepGreen Securityholders meeting;
- "***DeepGreen Common Shares***" are to common shares in the capital of DeepGreen;
- "***DeepGreen Earnout Shares***" are to the (a) 5,000,000 Class A Special Shares, (b) 10,000,000 Class B Special Shares, (c) 10,000,000 Class C Special Shares, (d) 20,000,000 Class D Special Shares, (e) 20,000,000 Class E Special Shares, (f) 20,000,000 Class F Special Shares, (g) 25,000,000 Class G Special Shares, and (h) 25,000,000 Class H Special Shares, in each case in the capital of TMC, each of which is automatically convertible into TMC Common Shares on a one for one basis (unless adjusted as described herein) if certain price per TMC Common Share thresholds are met as described in "*Description of TMC Securities — TMC Special Shares*;"
- "***DeepGreen Options***" are to options to purchase DeepGreen Common Shares granted under the Option Plan;
- **"*DeepGreen Preferred Shares*"** are to the Class B Preferred Shares of DeepGreen which are automatically converted into DeepGreen Common Shares immediately prior to the Effective Time;
- "***DeepGreen Shareholders***" are to the holders of DeepGreen Common Shares and the holders of DeepGreen Preferred Shares;
- "***Effective Time***" are to the time at which the Arrangement becomes effective;
- "***Exchange Act***" are to the Securities Exchange Act of 1934, as amended;
- "***Existing DeepGreen Securityholders***" are to the holders of DeepGreen Common Shares, DeepGreen Preferred Shares, and DeepGreen Options immediately prior to the Effective Time;
- "***Existing DeepGreen Shareholders***" are to the holders of DeepGreen Common Shares immediately prior to the Effective Time;
- "***Existing Governing Documents***" are to the Memorandum of Association and the Articles of Association;
- "***extraordinary general meeting***" are to the extraordinary general meeting of SOAC at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP located at 609 Main Street, Houston, Texas 77002, and via a virtual meeting, or at such other time, on such other date and at such other place to which the meeting may be adjourned;
- "***Final Order***" are to the final order of the Court pursuant to Section 291 of the BCBCA, in a form acceptable to DeepGreen and SOAC, each acting reasonably, approving the Arrangement, as such order may be amended by the Court, or with the consent of both DeepGreen and SOAC, such consent to not be unreasonably withheld, conditioned or delayed at any time prior to the Effective Time or, if appealed, then, unless such appeal is withdrawn or denied, as affirmed or as amended, on appeal; provided that any such amendment is acceptable to each of both DeepGreen and SOAC, each acting reasonably;
- "***initial public offering***" are to SOAC's initial public offering that was consummated on May 8, 2020;
- "***initial shareholders***" are to Sponsor and each of Messrs. Gaenzle, Barchas and Kelly;
- "***Memorandum of Association***" are to the amended and restated memorandum of association of SOAC;

- "***NewCo Sub***" are to 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada;
- "***NYSE***" are to the New York Stock Exchange;
- "***Option Plan***" are to the DeepGreen Metals Inc. Stock Option Plan adopted by the DeepGreen Board on September 17, 2013, as amended;
- "***ordinary shares***" are to our Class A ordinary shares and our Class B ordinary shares;
- "***PIPE Financing***" are to the transactions contemplated by the Subscription Agreements, pursuant to which the PIPE Investors have collectively committed to subscribe for an aggregate of 33,030,000 TMC Common Shares for an aggregate purchase price of $330,300,000 to be consummated in connection with Closing;
- "***PIPE Investors***" are to the investors that have committed to participate in the PIPE Financing, collectively;
- "***Plan of Arrangement***" are to the court-approved plan of arrangement under the BCBCA, substantially in the form attached to this proxy statement/prospectus as Annex J, with such changes as may be mutually agreed to by SOAC and DeepGreen in accordance with the Business Combination Agreement;
- "***private placement warrants***" are to the 9,500,000 private placement warrants outstanding as of the date of this proxy statement/prospectus that were issued to Sponsor as part of a private placement in connection with the initial public offering, which are substantially identical to the public warrants sold as part of the units in the initial public offering, subject to certain limited exceptions;
- "***pro forma***" are to giving pro forma effect to the Business Combination, including the Continuance, the Share Exchange and Amalgamation and the PIPE Financing;
- "***public shareholders***" are to holders of public shares, whether acquired in SOAC's initial public offering or acquired in the secondary market;
- "***public shares***" are to the currently outstanding 30,000,000 Class A ordinary shares of SOAC, whether acquired in SOAC's initial public offering or acquired in the secondary market;
- "***public warrants***" are to the currently outstanding 15,000,000 redeemable warrants to purchase Class A ordinary shares of SOAC that were issued by SOAC in its initial public offering;
- "***redemption***" are to each redemption of public shares for cash pursuant to the Existing Governing Documents;
- "***SEC***" are to the Securities and Exchange Commission;
- "***Securities Act***" are to the Securities Act of 1933, as amended;
- "***Share Exchange and Amalgamation***" are to the acquisition by SOAC, pursuant to the Arrangement, of all of the issued and outstanding shares in the capital of DeepGreen in exchange for TMC Common Shares and DeepGreen Earnout Shares and the amalgamation of DeepGreen and NewCo Sub;
- "***SOAC***," "***we***," "***us***" or "***our***" are to Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company limited by shares, prior to the consummation of the Business Combination;
- "***SOAC Board***" are to SOAC's board of directors;
- "***SOAC securities***" are to public shares and public warrants;
- "***Sponsor***" are to Sustainable Opportunities Holdings LLC, a Delaware limited liability company;

- "***Sponsor Earnout Shares***" are to the 500,000 Class I Special Shares and 741,000 Class J Special Shares in the capital of TMC, each of which is automatically convertible into TMC Common Shares on a one for one basis (unless adjusted as described herein) if certain TMC Common Share price thresholds are met as described in "*Description of TMC Securities — TMC Special Shares*;"
- "***Subscription Agreements***" are to the subscription agreements, entered into by SOAC and each of the PIPE Investors in connection with the PIPE Financing;
- "***TMC***" are to SOAC after giving effect to the consummation of the Continuance and the Business Combination;
- "***TMC Board***" are to TMC's board of directors;
- "***TMC Common Shares***" are to the common shares in the capital of TMC upon the Continuance;
- "***TMC Incentive Equity Plan***" are to the TMC Incentive Equity Plan to be considered for adoption and approval by the shareholders pursuant to the Incentive Award Plan Proposal;
- "***TMC Notice and Articles***" are to the notice of articles and articles of TMC upon the Continuance;
- "***TMC securities***" are to TMC Common Shares and TMC warrants;
- "***TMC Special Shares***" are to the DeepGreen Earnout Shares and the Sponsor Earnout Shares;
- "***transfer agent***" are to Continental, SOAC's transfer agent;
- "***trust account***" are to the trust account established at the consummation of SOAC's initial public offering that holds the proceeds of the initial public offering and is maintained by Continental, acting as trustee;
- "***units***" are to the units of SOAC, each unit representing one Class A ordinary share and one-half of one warrant to acquire one Class A ordinary share, that were offered and sold by SOAC in its initial public offering and in its concurrent private placement; and
- "***warrants***" are to the public warrants and the private placement warrants.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements in this proxy statement/prospectus may constitute "forward-looking statements" within the meaning of the "safe harbor" provisions of the United States Private Securities Litigation Reform Act of 1995. SOAC's and DeepGreen's actual results may differ from their expectations, estimates and projections and, consequently, you should not rely on these forward-looking statements as predictions of future events. Words such as "expect," "estimate," "project," "budget," "forecast," "anticipate," "intend," "plan," "may," "will," "could," "should," "believes," "predicts," "potential," "continue," and similar expressions (or the negative versions of such words or expressions) are intended to identify such forward-looking statements. These forward-looking statements include, without limitation, SOAC and DeepGreen's expectations with respect to future performance, development of its estimated resources of battery metals, potential regulatory approvals and anticipated financial impacts and other effects of the proposed Business Combination, the satisfaction of the closing conditions to the proposed Business Combination, the timing of the completion of the proposed Business Combination and the size and potential growth of current or future markets for the combined company's supply of battery metals. These forward-looking statements involve significant risks and uncertainties that could cause the actual results to differ materially from those discussed in the forward-looking statements. Most of these factors are outside SOAC's and DeepGreen's control and are difficult to predict. Factors that may cause such differences include, but are not limited to:

- the occurrence of any event, change or other circumstances that could give rise to the termination of the Business Combination Agreement;
- the outcome of any legal proceedings that may be instituted against SOAC and DeepGreen following the announcement of the Business Combination Agreement and the transactions contemplated therein;
- the inability to complete the proposed Business Combination, including due to failure to obtain approval of the shareholders of SOAC and DeepGreen, certain regulatory approvals or satisfy other conditions to closing in the Business Combination Agreement;
- the occurrence of any event, change or other circumstance that could give rise to the termination of the Business Combination Agreement or could otherwise cause the transaction to fail to close;
- the impact of COVID-19 on DeepGreen's business and/or the ability of the parties to complete the proposed Business Combination;
- the inability to obtain or maintain the listing of the combined company's shares on NYSE during the pendency of the Business Combination or NASDAQ following the proposed Business Combination;
- the risk that the proposed Business Combination disrupts current plans and operations as a result of the announcement and consummation of the proposed Business Combination;
- the ability to recognize the anticipated benefits of the proposed Business Combination, which may be affected by, among other things, the commercial and technical feasibility of seafloor polymetallic nodule collection and processing;
- the supply and demand for battery metals and manganese alloys; the future prices of battery metal and manganese alloys; the timing and content of International Seabed Authority's exploitation regulations that will create the legal and technical framework for exploitation of polymetallic nodules in the Clarion Clipperton Zone of the Pacific Ocean;
- government regulation of deep seabed mining operations and changes in mining laws and regulations;
- the risks of developing and deploying equipment for operations to collect polymetallic nodules at sea and to process such nodules on land;
- environmental risks;
- the timing and amount of estimated future production, costs of production, capital expenditures and requirements for additional capital;
- cash flow provided by operating activities; unanticipated reclamation expenses; claims and limitations on insurance coverage; the uncertainty in mineral resource estimates;

- financial risks posed by DeepGreen's material weakness in its internal control over financial reporting;
- the uncertainty in geological, hydrological, metallurgical and geotechnical studies and opinions; infrastructure risks;
- dependence on key management personnel and executive officers; and
- other risks and uncertainties indicated from time to time in the final prospectus of SOAC for its initial public offering and the proxy statement/prospectus relating to the proposed Business Combination, including those under "Risk Factors" therein, and in SOAC's other filings with the SEC. SOAC and DeepGreen caution that the foregoing list of factors is not exclusive.

SOAC and DeepGreen caution readers not to place undue reliance upon any forward-looking statements, which speak only as of the date when made. SOAC and DeepGreen do not undertake or accept any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements to reflect any change in its expectations or any change in events, conditions or circumstances on which any such statement is based.

QUESTIONS AND ANSWERS

The questions and answers below highlight only selected information from this document and only briefly address some commonly asked questions about the proposals to be presented at the extraordinary general meeting, including with respect to the proposed Business Combination. The following questions and answers do not include all the information that is important to SOAC's shareholders. We urge shareholders to read this proxy statement/prospectus, including the Annexes and the other documents referred to herein, carefully and in their entirety to fully understand the proposed Business Combination and the voting procedures for the extraordinary general meeting, which will be held at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP located at 609 Main Street, Houston, Texas 77002, and via a virtual meeting.

Q: WHY AM I RECEIVING THIS PROXY STATEMENT/PROSPECTUS?

A: SOAC shareholders are being asked to consider and vote upon, among other proposals, a proposal to approve and adopt the Business Combination Agreement and approve the transactions contemplated thereby, including the Business Combination. In accordance with the terms and subject to the conditions of the Business Combination Agreement, among other things, prior to the Effective Time, SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company in British Columbia, Canada, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Division 8 of Part 9 of the BCBCA, resulting in (i) the identifying name of the Class A ordinary shares and Class B ordinary shares being changed to TMC Common Shares and the Class A ordinary shares and Class B ordinary shares being changed from shares with par value to shares without par value; (ii) the rights and restrictions attached to the renamed Class A ordinary shares and Class B ordinary shares being deleted and the shares having the rights and restrictions attached to the TMC Common Shares, as described in the TMC Notice and Articles; (iii) the number of authorized TMC Common Shares being unlimited; (iv) each issued and outstanding whole warrant to purchase one Class A ordinary share automatically representing the right to purchase one TMC Common Share at an exercise price of $11.50 per share on the terms and conditions set forth in the SOAC warrant agreement; (v) the TMC Notice and Articles becoming the governing documents of SOAC; and (vi) SOAC's name changing to "TMC the metals company Inc." See "*Continuance Proposal.*"

On the Closing Date, promptly following the Continuance and pursuant to the Arrangement, (i) SOAC will acquire all of the issued and outstanding DeepGreen Common Shares, (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and DeepGreen Options, as applicable, the following shares or options to purchase the following shares: an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the effective time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia. In addition, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms. See "*Business Combination Proposal.*"

A copy of the Business Combination Agreement is attached to this proxy statement/prospectus as Annex A and you are encouraged to read the Business Combination Agreement in its entirety.

The approval of each of the Continuance Proposal and the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. The approval of the Business Combination Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

THE VOTE OF SHAREHOLDERS IS IMPORTANT. SHAREHOLDERS ARE ENCOURAGED TO VOTE AS SOON AS POSSIBLE AFTER CAREFULLY REVIEWING THIS PROXY STATEMENT/PROSPECTUS.

Q: WHAT PROPOSALS ARE SHAREHOLDERS OF SOAC BEING ASKED TO VOTE UPON?

A: At the extraordinary general meeting, SOAC is asking holders of its ordinary shares to consider and vote upon seven separate proposals:

1. a proposal to approve the Continuance;
2. a proposal to approve the Business Combination Agreement and the transactions contemplated therein, including the Share Exchange and Amalgamation;
3. a proposal to approve the TMC Notice and Articles;
4. a proposal to approve, on a non-binding advisory basis, certain material differences between the Existing Governing Documents and the TMC Notice and Articles;
5. a proposal to approve the issuance of TMC Common Shares and securities convertible into or exchangeable for TMC Common Shares in connection with the Business Combination and the PIPE Financing in compliance with the rules of the NYSE;
6. a proposal to approve and adopt the Incentive Equity Plan; and
7. a proposal to approve the adjournment of the extraordinary general meeting to a later date or dates, if necessary, to, among other things, permit further solicitation and vote of proxies in the event that there are insufficient votes for the approval of one or more proposals at the extraordinary general meeting.

If our shareholders do not approve each of the Condition Precedent Proposals, then unless certain conditions in the Business Combination Agreement are waived by the applicable parties to the Business Combination Agreement, the Business Combination Agreement could terminate and the Business Combination may not be consummated.

For more information, please see "*Proposal No. 1 — Continuance Proposal*," "*Proposal No. 2 — Business Combination Proposal*," "*Proposal No. 3 — Charter Proposal*," "*Proposal No. 4 — Organizational Documents Proposals*," "*Proposal No. 5 — NYSE Proposal*," "*Proposal No. 6 — Incentive Award Plan Proposal*" and "*Proposal No. 7 — Adjournment Proposal*."

SOAC will hold the extraordinary general meeting to consider and vote upon these proposals. This proxy statement/prospectus contains important information about the Business Combination and the other matters to be acted upon at the extraordinary general meeting. Shareholders of SOAC should read it carefully.

After careful consideration, the SOAC Board has determined that the Continuance Proposal, the Business Combination Proposal, the Charter Proposal, the Organizational Documents Proposals, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal are in the best interests of SOAC and its shareholders and unanimously recommends that you vote or give instruction to vote "FOR" each of those proposals.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote "FOR" the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

Q: WHY IS SOAC PROPOSING THE BUSINESS COMBINATION?

A: SOAC is a blank check company incorporated on December 18, 2019 as a Cayman Islands exempted company limited by shares for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses or entities. Although SOAC may pursue an acquisition opportunity in any business, industry, sector or geographical location for purposes of consummating an initial business combination, SOAC has focused on investment opportunities that exist within industries that benefit from strong Environmental, Social and Governance ("ESG") profiles,

particularly targets that have existing environmental sustainability practices or that may benefit, both operationally and economically, from the SOAC management team's commitment and expertise in executing such practices.

SOAC has identified several criteria and guidelines it believes are important for evaluating acquisition opportunities. SOAC has sought to acquire businesses that: benefit from environmentally sustainable business practices, have a defensible market position, have an attractive financial profile, would benefit uniquely from SOAC's capabilities, have a committed and capable management team and have the potential to grow organically or through additional acquisitions.

Based on its due diligence investigations of DeepGreen and the industry in which it operates, including the financials and other information provided by DeepGreen in the course of negotiations, the SOAC Board believes that DeepGreen meets the criteria and guidelines listed above. However, there is no assurance of this. See "*Business Combination Proposal — The SOAC Board's Reasons for the Business Combination*."

Although the SOAC Board believes that the Business Combination with DeepGreen presents a unique business combination opportunity and is in the best interests of SOAC and its shareholders, the SOAC Board did consider certain potentially material negative factors in arriving at that conclusion. These factors are discussed in greater detail in the sections entitled "*Business Combination Proposal — The SOAC Board's Reasons for the Business Combination*" and "*Risk Factors — Risks Related to SOAC's Business and to TMC's Business Following the Business Combination*."

Q: HOW WILL THE BUSINESS COMBINATION BE CONSUMMATED?

A: If our shareholders approve each of the Condition Precedent Proposals at the extraordinary general meeting, the Business Combination will be consummated in the following steps:

- Prior to the Effective Time, SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company in British Columbia, Canada, resulting in, among other things:
  - The identifying name of the Class A ordinary shares and Class B ordinary shares being changed to TMC Common Shares and the rights and restrictions attached to the renamed Class A ordinary shares and Class B ordinary shares being changed to the rights and restrictions attached to the TMC Common Shares; and
  - The issued and outstanding warrants to purchase Class A ordinary shares automatically representing the right to purchase TMC Common Shares.
- On the Closing Date, pursuant to the Arrangement,
  - SOAC will acquire all of the issued and outstanding DeepGreen Common Shares;
  - The shareholders and optionholders of DeepGreen will receive TMC Common Shares and the DeepGreen Earnout Shares (or options to purchase such TMC Common Shares and DeepGreen Earnout Shares) in exchange for their DeepGreen Common Shares or DeepGreen Options, as applicable;
  - DeepGreen will become a wholly-owned subsidiary of TMC; and
  - DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia.

Please see the section entitled "*Business Combination Proposal*."

Q: DID THE SOAC BOARD OBTAIN A THIRD-PARTY VALUATION OR FAIRNESS OPINION IN DETERMINING WHETHER OR NOT TO PROCEED WITH THE BUSINESS COMBINATION?

A: No. The SOAC Board did not obtain a third-party valuation or fairness opinion in connection with its determination to approve the Business Combination. However, SOAC's management, the members of the SOAC Board and the other representatives of SOAC have substantial experience in evaluating the operating and financial merits of companies similar to DeepGreen and have reviewed certain financial information of DeepGreen and compared it to certain publicly traded companies, selected based on the experience and the professional judgment of SOAC's management team, which enabled them to make the necessary analyses and determinations regarding the Business Combination. Accordingly, investors will be relying solely on the judgment of the SOAC Board in valuing DeepGreen's business and assuming the risk that the SOAC Board may not have properly valued such business.

Q: WHAT INTERESTS DO SOAC'S CURRENT OFFICERS AND DIRECTORS HAVE IN THE BUSINESS COMBINATION?

A: The initial shareholders, including SOAC's directors and executive officers, may have interests in the Business Combination that are different from, in addition to or in conflict with yours. These interests include:

- the fact that the initial shareholders have agreed not to redeem any Class A ordinary shares held by them in connection with a shareholder vote to approve a proposed initial business combination;
- the fact that Sponsor paid an aggregate of $25,000 for the 7,500,000 Class B ordinary shares currently owned by the initial shareholders and such securities will have a significantly higher value at the time of the Business Combination;
- the fact that 741,000 of the TMC Common Shares that will be held by Sponsor as a result of the Continuance will be exchanged for 1,241,000 Sponsor Earnout Shares at the Effective Time, and that such Sponsor Earnout Shares will be convertible to TMC Common Shares on a one for one basis if certain TMC Common Share price thresholds are met as described in "*Description of TMC Securities — TMC Special Shares*;"
- the fact that Sponsor paid $9,500,000 for its private placement warrants, and the Class A ordinary shares underlying those warrants would be worthless if a business combination is not consummated by November 8, 2021 (unless such date is extended in accordance with the Existing Governing Documents);
- the fact that the initial shareholders and SOAC's other current officers and directors have agreed to waive their rights to liquidating distributions from the trust account with respect to any ordinary shares (other than public shares) held by them if SOAC fails to complete an initial business combination by November 8, 2021;
- the fact that the Amended and Restated Registration Rights Agreement will be entered into by Sponsor and Messrs. Gaenzle, Barchas and Kelly;
- the right of Sponsor and Messrs. Gaenzle, Barchas and Kelly to hold TMC Common Shares following the Business Combination, subject to certain lock-up periods;
- the right of Sponsor to hold Sponsor Earnout Shares following the Business Combination;
- the fact that, at the option of Sponsor and with DeepGreen's consent, any amounts outstanding under any loan made by Sponsor or any of its affiliates to SOAC in an aggregate amount of up to $1,500,000 may be converted into warrants to purchase Class A ordinary shares in connection with the consummation of the Business Combination;
- the continued indemnification of SOAC's directors and officers and the continuation of SOAC's directors' and officers' liability insurance after the Business Combination (i.e., a "tail policy");
- the fact that Sponsor and SOAC's officers and directors will lose their entire investment in SOAC and will not be reimbursed for any out-of-pocket expenses if an initial business combination is not consummated by November 8, 2021;

- the fact that if the trust account is liquidated, including in the event SOAC is unable to complete an initial business combination by November 8, 2021, Sponsor has agreed to indemnify SOAC to ensure that the proceeds in the trust account are not reduced below $10.00 per public share, or such lesser per public share amount as is in the trust account on the liquidation date, by the claims of prospective target businesses with which SOAC has entered into an acquisition agreement or claims of any third party for services rendered or products sold to SOAC, but only if such a vendor or target business has not executed a waiver of any and all rights to seek access to the trust account; and
- the fact that SOAC may be entitled to distribute or pay over funds held by SOAC outside the trust account to Sponsor or any of its affiliates prior to the Closing.

Please see the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Directors in the Business Combination*" for more information.

Q: WHAT WILL THE EXISTING DEEPGREEN SECURITYHOLDERS RECEIVE IN CONNECTION WITH THE BUSINESS COMBINATION WITH SOAC?

A: Under the Arrangement, the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and DeepGreen Options, as applicable, the following shares or options to purchase the following shares: an aggregate of (i) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the effective time of approximately $2.3 billion; and (ii) the DeepGreen Earnout Shares. In addition, upon the consummation of the Business Combination, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares in accordance with its terms.

Q: HOW WILL THE COMBINED COMPANY BE MANAGED FOLLOWING THE BUSINESS COMBINATION?

A: Following the Closing, it is expected that the current management of DeepGreen will become the management of TMC, and the TMC Board will consist of nine directors. Pursuant to the Business Combination Agreement, the TMC Board will consist of (i) one (1) individual designated by Sponsor prior to the mailing of this proxy statement to SOAC shareholders, (ii) five individuals designated by DeepGreen prior to the mailing of this proxy statement to SOAC shareholders and (iii) three independent directors to be designated by DeepGreen prior to the mailing of this proxy statement to SOAC shareholders. Please see the section entitled "*Management of TMC Following the Business Combination*" for further information.

Q: WHAT EQUITY STAKE WILL CURRENT SOAC SHAREHOLDERS AND EXISTING DEEPGREEN SECURITYHOLDERS HOLD IN TMC IMMEDIATELY AFTER THE CONSUMMATION OF THE BUSINESS COMBINATION?

A: As of the date of this proxy statement/prospectus, there are (i) 30,000,000 Class A ordinary shares outstanding underlying units issued in SOAC's initial public offering and (ii) 7,500,000 Class B ordinary shares outstanding held by SOAC's initial shareholders. As of the date of this proxy statement/prospectus, there are 9,500,000 outstanding private placement warrants held by Sponsor and 15,000,000 outstanding public warrants. Each whole warrant entitles the holder thereof to purchase one Class A ordinary share and, following the Continuance, will entitle the holder thereof to purchase one TMC Common Share. Therefore, as of the date of this proxy statement/prospectus (without giving effect to the Business Combination and assuming that none of SOAC's outstanding public shares are redeemed in connection with the Business Combination), SOAC's fully-diluted share capital, giving effect to the exercise of all of the private placement warrants and public warrants, would be 62,000,000 ordinary shares.

The following table illustrates ownership levels in TMC Common Shares immediately following the consummation of the Business Combination, assuming either no redemptions of the Class A ordinary shares or that all of the Class A ordinary shares are redeemed, and the following additional assumptions: (i) 230,600,000 TMC Common Shares are issued to the holders of DeepGreen Common Shares and the holders of the DeepGreen Options (assuming exercise of such options), which would be the number of TMC Common Shares

issued to these holders if the Adjusted Equity Value immediately prior to the Effective Date was approximately $2.3 billion; (ii) 33,030,000 TMC Common Shares are issued in the PIPE Financing; (iii) no public warrants or private placement warrants to purchase TMC Common Shares that will be outstanding immediately following Closing are exercised; (iv) the Allseas Warrant exercisable for TMC Common Shares upon consummation of the Business Combination is not exercised and (vi) no TMC Special Shares are converted to TMC Common Shares. If the actual facts are different than these assumptions, the ownership percentages in TMC will be different.

	Share Ownership in TMC	
	No redemptions	Maximum redemptions[1]
	Percentage of Outstanding Shares	Percentage of Outstanding Shares
SOAC public shareholders	10.0%	0.0%
Our initial shareholders[2]	2.3%	2.5%
PIPE Investors	11.0%	12.2%
Existing DeepGreen Securityholders[3]	76.7%	85.3%

(1) Assumes that all of SOAC's outstanding public shares are redeemed in connection with the Business Combination, in which case the Aggregate Transaction Proceeds Condition and the Net Tangible Assets Condition are expected to be satisfied by the closing of the PIPE Financing.

(2) Includes 6,759,000 TMC Common Shares that will be issued to the holders of the existing Class B ordinary shares as a result and upon the consummation of the Continuance, and excludes 741,000 TMC Common Shares that are expected to be exchanged for Sponsor Earnout Shares at the Effective Time. Also excludes the TMC Common Shares that are issuable upon conversion of the Sponsor Earnout Shares.

(3) Represents 230,600,000 TMC Common Shares to be issued in connection with the Arrangement and excludes the TMC Common Shares that are issuable upon conversion of the DeepGreen Earnout Shares.

Q: WHY IS SOAC PROPOSING THE CONTINUANCE?

A: Our board of directors believes that it is in the best interest of SOAC to migrate and be continued from the Cayman Islands to British Columbia, Canada in order to adequately address the needs of SOAC and its shareholders following the consummation of the Business Combination and as the parent company to DeepGreen, a company incorporated under the BCBCA. See "*Continuance Proposal — Reasons for the Continuance*."

The approval of the Continuance Proposal is a condition to closing the Business Combination under the Business Combination Agreement. The approval of the Continuance Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the extraordinary general meeting, and otherwise will have no effect on a particular proposal.

Q: WHAT ARE THE MATERIAL CHANGES BETWEEN THE CURRENT CONSTITUTIONAL DOCUMENTS OF SOAC AND THE TMC NOTICE AND ARTICLES?

A: The consummation of the Business Combination is conditional, among other things, on the Continuance. Accordingly, in addition to voting on the Business Combination, SOAC's shareholders also are being asked to consider and vote upon a proposal to approve the Continuance, and replace SOAC's Existing Governing Documents under Cayman Islands law with the TMC Notice and Articles, which differ from the Existing Governing Documents in the following material respects:

	Existing Governing Documents	TMC Notice and Articles
Governing Statute	The Companies Act (as Revised) of the Cayman Islands.	*Business Corporations Act* (British Columbia)
Corporate Name	Sustainable Opportunities Acquisition Corp.	TMC the metals company Inc.
Authorized Capital	300,000,000 Class A ordinary shares, 30,000,000 Class B ordinary shares, and 1,000,000 preference shares, each with a par value of $0.0001 per share.	An unlimited number of common shares, an unlimited number of preferred shares, issuable in series, 5,000,000 Class A Special Shares, 10,000,000 Class B Special Shares, 10,000,000 Class C Special Shares, 20,000,000 Class D Special Shares, 20,000,000 Class E Special Shares, 20,000,000 Class F Special Shares, 25,000,000 Class G Special Shares, 25,000,000 Class H Special Shares, 500,000 Class I Special Shares, and 741,000 Class J Special Shares, each without par value. See "*Description of TMC Securities*" for a description of the rights and restrictions attached to the securities of TMC upon the Continuance.
Directors; Classes	The directors are divided into three classes: Class I; Class II; and Class III. The Class I directors stand appointed for a term expiring at SOAC's first annual general meeting, the Class II directors stand appointed for a term expiring at SOAC's second annual general meeting and the Class III directors shall stand appointed for a term expiring at SOAC's third annual general meeting. Directors appointed to succeed those directors who terms expire shall be appointed for a term of office to expire at the third succeeding annual general meeting after their appointment.	The board of directors will consist of a minimum of three directors. Following the Continuance, the board of directors of TMC will be composed of nine directors. The board of directors will not be divided into classes and each director will be elected on an annual basis.
Notice of Shareholder Meeting	At least five days' notice is given of any shareholder meeting.	The board of directors of TMC will have the power to call a meeting of shareholders. Under the BCBCA, in certain circumstances, shareholders can also requisition meetings. The time period to provide notice of the time and place of a meeting of shareholders is not less than 21 days and not more than two months before the meeting.

	Existing Governing Documents	TMC Notice and Articles
Shareholder Written Consent in Lieu of a Meeting	No special business shall be transacted at any general meeting without the consent of all Shareholders entitled to receive notice of that meeting unless notice of such special business has been given in the notice convening that meeting. A resolution signed by all shareholders shall be as valid and effective as if the resolution had been passed at a general meeting of the Company.	The shareholders may consent to all of the business that is required to be transacted at a meeting of shareholders by unanimous written resolution, as provided for under the BCBCA. An ordinary resolution of shareholders may be passed if it is consented to in writing by shareholders holding shares that carry at least two-thirds of the votes entitled to be cast on the resolution, provided that the resolution has been submitted to all shareholders holding shares that carry the right to vote at general meetings.
Quorum	The holders of a majority of the shares being individuals present in person or by proxy or if a corporation or other non-natural person by its duly authorized representative or proxy shall be a quorum.	Subject to the special rights and restrictions attached to the shares of any class or series of shares of the Company, a quorum is present at a meeting of shareholders if at least two shareholders, representing not less than one-third ($33^{1/3}$%) of the shares entitled to vote at such meeting, are present in person or represented by proxy.
Shareholder Vote; Casting Vote	In the case of an equality of votes, at either a meeting of shareholders or a meeting of directors, the chairman shall be entitled to a second or casting vote. Provisions of the amended and restated memorandum and articles of association may be amended with a shareholder vote.	In the case of an equality of votes, at either a meeting of shareholders or a meeting of directors, the chair of the meeting is not entitled to a second or casting vote. Provisions of the TMC Notice and Articles may be amended with a shareholder vote, or in certain circumstances by directors resolution, as set out in the TMC Notice and Articles, and the BCBCA.
Advance Notice; Director Nominations; Shareholder Proposals;	Members seeking to bring business before the annual general meeting or to nominate candidates for appointment as directors at the annual general meeting must deliver notice to the principal executive offices of SOAC not less than 120 calendar days before the date of SOAC's proxy statement released to members in connection with the previous year's annual general meeting or, if the Company did not hold an annual general meeting the previous year, or if the date of the current year's annual general meeting has been changed by more than 30 days from the date of the previous year's annual general meeting, then the deadline shall be set by the board of Directors with such deadline being a reasonable time before the Company begins to print and send its related proxy materials.	Nominations of persons for election to the board may be made for any annual meeting of shareholders, or for any special meeting of shareholders if one of the purposes for which the special meeting was called was the election of directors by a nominating shareholder provided that the nomination is made, in the case of an annual meeting of shareholders, not less than 30 days prior to the date of the annual meeting of shareholders; provided, however, that in the event that the annual meeting of shareholders is to be held on a date that is less than 50 days after the date (the "Notice Date") on which the first

	Existing Governing Documents	TMC Notice and Articles
		public announcement of the date of the annual meeting was made, notice by the nominating shareholder may be made not later than the close of business on the tenth (10th) day following the Notice Date; and in the case of a special meeting (which is not also an annual meeting) of shareholders called for the purpose of electing directors of the Corporation, not later than the close of business on the fifteenth (15th) day following the Notice Date. To be in proper form, the notice of nomination must include certain prescribed information about the nominating shareholder and the proposed nominee. Shareholder proposals are otherwise governed by the provisions of the BCBCA.
Forum Selection	None.	Unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada and the appellate Courts therefrom, will, to the fullest extent permitted by law, be the sole and exclusive forum for: (i) any derivative action or proceeding brought on behalf of TMC; (ii) any action or proceeding asserting breach of fiduciary duty owed by any director, officer or other employee of TMC to TMC; (iii) any action or proceeding asserting a claim arising pursuant to any provision of the BCBCA, or TMC Notice and Articles; or (iv) any action or proceeding asserting a claim otherwise related to the relationships among TMC, its affiliates and their respective shareholders, directors and/or officers, but excluding claims related to TMC's business or of such affiliates. The foregoing will not apply to any action brought to enforce a duty or liability created by the Securities Act or the Exchange Act, or the rules and regulations thereunder. Unless TMC consents in writing to the selection of an alternative forum, the federal district courts of the United States of America will be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act.
Takeovers by Interested Shareholders	None.	The TMC Notice and Articles will not include provisions with respect to takeovers of the Company.

Q: WHY IS SOAC PROPOSING THE ORGANIZATIONAL DOCUMENTS PROPOSALS?

A: SOAC is requesting that its shareholders vote upon, on a non-binding advisory basis, proposals to approve certain governance provisions contained in the TMC Notice and Articles that materially affect shareholder rights. This separate vote is not required by Cayman Islands law separate and apart from the Charter Proposal, but pursuant to SEC guidance, SOAC is required to submit these provisions to its shareholders separately for approval. However, the shareholder vote regarding this proposal is an advisory vote, and is not binding on SOAC and the SOAC Board (separate and apart from the approval of the Charter Proposal). Furthermore, the Business Combination is not conditioned on the separate approval of the Organizational Documents Proposals (separate and apart from approval of the Charter Proposal). Please see the section entitled "*Proposal No. 4 — The Organizational Documents Proposals*" for additional information.

Q: HOW WILL THE CONTINUANCE AFFECT MY ORDINARY SHARES AND WARRANTS?

A: As a result and upon the consummation of the Continuance, prior to the Effective Time, (i) the identifying name of the Class A ordinary shares and Class B ordinary shares will be changed to TMC Common Shares and the Class A ordinary shares and Class B ordinary shares will be changed from shares with par value to shares without par value; (ii) the rights and restrictions attached to the renamed Class A ordinary shares and Class B ordinary shares will be deleted and the shares will have the rights and restrictions attached to the TMC Common Shares, as described in the TMC Notice and Articles; (iii) the number of authorized TMC Common Shares will be unlimited; and (iv) each issued and outstanding whole warrant to purchase one Class A ordinary share will automatically represent the right to purchase one TMC Common Share at an exercise price of $11.50 per share on the terms and conditions set forth in the SOAC warrant agreement. See "*Continuance Proposal*."

Q: WHAT ARE THE U.S. FEDERAL INCOME TAX CONSEQUENCES OF THE CONTINUANCE?

A: As discussed more fully under "*U.S. Federal Income Tax Considerations*" and subject to the "passive foreign investment company" rules described therein, it is intended that the Continuance constitute a tax-deferred reorganization within the meaning of Section 368(a)(l)(F) of the U.S. Internal Revenue Code of 1986, as amended (the "Code").

For a more complete discussion of the U.S. federal income tax considerations of the Continuance, see "*U.S. Federal Income Tax Considerations*."

Q: DO I HAVE REDEMPTION RIGHTS?

A: If you are a holder of public shares, you have the right to request that SOAC redeem all or a portion of your public shares for cash provided that you follow the procedures and deadlines described elsewhere in this proxy statement/prospectus. **You are not required to affirmatively vote for or against the Business Combination Proposal or any of the other proposals set forth in this proxy statement/prospectus in order to redeem your public shares for cash. This means that (unless you have agreed not to do so by executing the Sponsor Letter Agreement) if you hold public shares on or before , 2021 (two (2) business days before the extraordinary general meeting), you may elect to redeem your public shares whether or not you were a holder as of the record date, and whether or not you vote "FOR" the Business Combination Proposal or any of the other proposals set forth in this proxy statement/prospectus**. If you wish to exercise your redemption rights, please see the answer to the next question: "*How do I exercise my redemption rights?*"

Notwithstanding the foregoing, a public shareholder, together with any affiliate of such public shareholder or any other person with whom such public shareholder is acting in concert or as a "group" (as defined in Section 13(d)(3) of the Exchange Act), will be restricted from redeeming its public shares with respect to more than an aggregate of 15% of the public shares. Accordingly, if a public shareholder, alone or acting in concert or as a group, seeks to redeem more than 15% of the public shares, then any such shares in excess of that 15% limit would not be redeemed for cash.

The initial shareholders have agreed to waive their redemption rights with respect to all of their ordinary shares in connection with the consummation of the Business Combination. Such shares will be excluded from the pro rata calculation used to determine the per-share redemption price.

Q: HOW DO I EXERCISE MY REDEMPTION RIGHTS?

A: In connection with the proposed Business Combination, pursuant to the Existing Governing Documents, SOAC's public shareholders (other than those who have agreed not to do so by executing a Transaction Support Agreement (as defined below)) may request that SOAC redeem all or a portion of such public shares for cash if the Business Combination is consummated. If you are a public shareholder and wish to exercise your right to redeem the public shares, you must:

(i) (a) hold public shares, or (b) if you hold public shares through units, elect to separate your units into the underlying public shares and public warrants prior to exercising your redemption rights with respect to the public shares;

(ii) submit a written request to Continental, SOAC's transfer agent, in which you (a) request that we redeem all or a portion of your public shares for cash, and (b) identify yourself as the beneficial holder of the public shares and provide your legal name, phone number and address; and

(iii) deliver your public shares to Continental, our transfer agent, physically or electronically through The Depository Trust Company ("DTC").

Holders must complete the procedures for electing to redeem their public shares in the manner described above prior to 5:00 p.m., Eastern Time, on , 2021 (two business days before the extraordinary general meeting) in order for their shares to be redeemed.

The address of Continental, SOAC's transfer agent, is listed under the question "*Who can help answer my questions?*" below.

Holders of units must elect to separate their units into the underlying public shares and public warrants prior to exercising redemption rights with respect to the public shares. If holders hold their units in an account at a brokerage firm or bank, holders must notify their broker or bank that they elect to separate the units into the underlying public shares and public warrants, or if a holder holds units registered in its own name, the holder must contact Continental, our transfer agent, directly and instruct them to do so.

Public shareholders will be entitled to request that their public shares be redeemed for a pro rata portion of the amount then on deposit in the trust account as of two business days prior to the consummation of the Business Combination including interest earned on the funds held in the trust account and not previously released to us (net of taxes payable). For illustrative purposes, as of , 2021, this would have amounted to approximately $ per issued and outstanding public share. However, the proceeds deposited in the trust account could become subject to the claims of our creditors, if any, which could have priority over the claims of our public shareholders, regardless of whether such public shareholders vote, or, if they do vote, irrespective of if they vote for or against the Business Combination Proposal. Therefore, the per share distribution from the trust account in such a situation may be less than originally expected due to such claims. Whether you vote, and if you do vote, irrespective of how you vote, on any proposal, including the Business Combination Proposal, will have no impact on the amount you will receive upon exercise of your redemption rights. It is expected that the funds to be distributed to public shareholders electing to redeem their public shares will be distributed promptly after the consummation of the Business Combination.

Any request for redemption, once made by a holder of public shares, may be withdrawn at any time up to the time the vote is taken with respect to the Business Combination Proposal at the extraordinary general meeting. If you deliver your shares for redemption to Continental, our transfer agent, and later decide prior to the extraordinary general meeting not to elect redemption, you may request that our transfer agent return the shares (physically or electronically) to you. You may make such request by contacting Continental at the phone number or address listed at the end of this section.

Any corrected or changed written exercise of redemption rights must be received by Continental prior to the vote taken on the Business Combination Proposal at the extraordinary general meeting. **No request for redemption will be honored unless the holder's public shares have been delivered (either physically or electronically) to Continental, our transfer agent, at least two business days prior to the vote at the extraordinary general meeting.**

If a holder of public shares properly makes a request for redemption and the public shares are delivered as described above, then, if the Business Combination is consummated, we will redeem the public shares for a pro rata portion of funds deposited in the trust account, calculated as of two business days prior to the consummation of the Business Combination.

If you are a holder of public shares and you exercise your redemption rights, such exercise will not result in the loss of any warrants that you may hold.

Q: IF I AM A HOLDER OF UNITS, CAN I EXERCISE REDEMPTION RIGHTS WITH RESPECT TO MY UNITS?

A: No. Holders of issued and outstanding units must elect to separate the units into the underlying public shares and public warrants prior to exercising redemption rights with respect to the public shares. If you hold your units in an account at a brokerage firm or bank, you must notify your broker or bank that you elect to separate the units into the underlying public shares and public warrants, or if you hold units registered in your own name, you must contact Continental, our transfer agent, directly and instruct them to do so. The redemption rights include the requirement that a holder must identify itself in writing as a beneficial holder and provide its legal name, phone number and address to Continental in order to validly redeem its shares. You are requested to cause your public shares to be separated and delivered to Continental, our transfer agent, by 5:00 p.m., Eastern Time, on , 2021 (two business days before the extraordinary general meeting) in order to exercise your redemption rights with respect to your public shares.

Q: WHAT ARE THE U.S. FEDERAL INCOME TAX CONSEQUENCES OF EXERCISING MY REDEMPTION RIGHTS?

A: Subject to the "passive foreign investment company" rules described below under "*U.S. Federal Income Tax Considerations*," we expect that a U.S. Holder (as defined in "*U.S. Federal Income Tax Considerations — U.S. Holders*") that exercises its redemption rights to receive cash from the trust account in exchange for its public shares will generally be treated as selling such public shares resulting in the recognition of capital gain or capital loss. There may be certain circumstances in which the redemption may be treated as a distribution for U.S. federal income tax purposes depending on the amount of public shares that such U.S. Holder owns or is deemed to own (including through the ownership of warrants and constructive ownership) prior to and following the redemption. For a more complete discussion of the U.S. federal income tax considerations of an exercise of redemption rights, see "*U.S. Federal Income Tax Considerations.*"

Q: WHAT HAPPENS TO THE FUNDS DEPOSITED IN THE TRUST ACCOUNT AFTER CONSUMMATION OF THE BUSINESS COMBINATION?

A: Following the closing of our initial public offering, an amount equal to $300,000,000 ($10.00 per unit) of the net proceeds from our initial public offering and the sale of the private placement warrants was placed in the trust account. As of March 31, 2021, funds in the trust account totaled approximately $300 million and were held in U.S. treasury securities. These funds will remain in the trust account, except for the withdrawal of interest to pay taxes, if any, until the earliest of (i) the completion of a business combination (including the closing of the Business Combination) or (ii) the redemption of all of the public shares if we are unable to complete a business combination by November 8, 2021 (unless such date is extended in accordance with the Existing Governing Documents), subject to applicable law.

If our initial business combination is paid for using equity or debt securities or if not all of the funds released from the trust account are used for payment of the consideration in connection with our initial business combination or used for redemptions or purchases of the public shares, we may apply the balance of the cash

released to us from the trust account for general corporate purposes, including for maintenance or expansion of operations of TMC, the payment of principal or interest due on indebtedness incurred in completing our Business Combination, to fund the purchase of other companies or for working capital. See "*Summary of the Proxy Statement/Prospectus — Sources and Uses of Funds for the Business Combination*."

Q: WHAT HAPPENS IF A SUBSTANTIAL NUMBER OF THE PUBLIC SHAREHOLDERS VOTE IN FAVOR OF THE BUSINESS COMBINATION PROPOSAL AND EXERCISE THEIR REDEMPTION RIGHTS?

A: Our public shareholders are not required to vote "FOR" the Business Combination in order to exercise their redemption rights. Accordingly, the Business Combination may be consummated even though the funds available from the trust account and the number of public shareholders are reduced as a result of redemptions by public shareholders.

In no event will SOAC redeem public shares in an amount that would cause our net tangible assets (as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act) to be less than $5,000,001 after giving effect to the transactions contemplated by the Business Combination Agreement and the PIPE Financing.

Additionally, as a result of redemptions, the trading market for the TMC Common Shares may be less liquid than the market for the public shares was prior to consummation of the Business Combination and we may not be able to meet the listing standards for the NYSE or another national securities exchange.

Q: WHAT CONDITIONS MUST BE SATISFIED TO COMPLETE THE BUSINESS COMBINATION?

A: The consummation of the Business Combination is conditioned upon, among other things, (i) the approval by our shareholders of the Condition Precedent Proposals being obtained; (ii) the approval by the securityholders of DeepGreen of the DeepGreen Arrangement Resolution being obtained; (iii) the obtainment of the Final Order on terms consistent with the Business Combination Agreement; (iv) the fulfillment of the Aggregate Transaction Proceeds Condition; (v) the approval by NASDAQ of our initial listing application in connection with the Business Combination; and (vi) SOAC having at least $5,000,001 of net tangible assets, as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act after giving effect to the transactions contemplated by the Business Combination Agreement (including the PIPE Financing) (the "Net Tangible Assets Condition"). The Aggregate Transaction Proceeds Condition and the Net Tangible Assets Condition are expected to be satisfied by the closing of the PIPE Financing.

For more information about conditions to the consummation of the Business Combination, see "*Business Combination Proposal — Conditions to Closing of the Business Combination*."

Q: WHEN DO YOU EXPECT THE BUSINESS COMBINATION TO BE COMPLETED?

A: It is currently expected that the Business Combination will be consummated in the second quarter of 2021. This date depends, among other things, on the approval of the proposals to be put to SOAC shareholders at the extraordinary general meeting. However, such extraordinary general meeting could be adjourned if the Adjournment Proposal is adopted by our shareholders at the extraordinary general meeting and we elect to adjourn the extraordinary general meeting to a later date or dates to consider and vote upon a proposal to approve by ordinary resolution the adjournment of the extraordinary general meeting to a later date or dates (A) to the extent necessary to ensure that any required supplement or amendment to the accompanying proxy statement/prospectus is provided to SOAC shareholders or, if as of the time for which the extraordinary general meeting is scheduled, there are insufficient SOAC ordinary shares represented (either in person or by proxy) to constitute a quorum necessary to conduct business at the extraordinary general meeting or (B) in order to solicit additional proxies from SOAC shareholders in favor of one or more of the proposals at the extraordinary general meeting. For a description of the conditions for the completion of the Business Combination, see "*Business Combination Proposal — Conditions to Closing of the Business Combination*."

Q: WHAT HAPPENS IF THE BUSINESS COMBINATION IS NOT CONSUMMATED?

A: SOAC will not complete the Continuance unless all other conditions to the consummation of the Business Combination have been satisfied or waived by the parties in accordance with the terms of the Business Combination Agreement. If SOAC is not able to consummate the Business Combination nor able to complete

another business combination by November 8, 2021, in each case, as such date may be extended pursuant to our Existing Governing Documents, we will: (i) cease all operations except for the purpose of winding up; (ii) as promptly as reasonably possible but not more than ten business days thereafter, redeem the public shares, at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the trust account, including interest (which interest shall be net of taxes payable, and less up to $100,000 of interest to pay dissolution expenses), divided by the number of then outstanding public shares, which redemption will completely extinguish public shareholders' rights as shareholders (including the right to receive further liquidating distributions, if any), subject to applicable law; and (iii) as promptly as reasonably possible following such redemption, subject to the approval of our remaining shareholders and our board of directors, liquidate and dissolve, subject in each case to our obligations under Cayman Islands law to provide for claims of creditors and the requirements of other applicable laws.

Q: DO I HAVE APPRAISAL RIGHTS IN CONNECTION WITH THE PROPOSED BUSINESS COMBINATION AND THE PROPOSED CONTINUANCE?

A: Neither our shareholders nor our warrant holders have appraisal rights in connection with the Business Combination or the Continuance under the Cayman Islands Companies Law or under the BCBCA.

Q: WHAT DO I NEED TO DO NOW?

A: We urge you to read this proxy statement/prospectus, including the Annexes and the documents referred to herein, carefully and in their entirety and to consider how the Business Combination will affect you as a shareholder and/or warrant holder. Our shareholders should then vote as soon as possible in accordance with the instructions provided in this proxy statement/prospectus and on the enclosed proxy card.

Q: HOW DO I VOTE?

A: If you hold your shares in "street name," which means your shares are held of record by a broker, bank or nominee, and were a holder of record of ordinary shares on , 2021, the record date for the extraordinary general meeting, you may vote with respect to the proposals in person or virtually at the extraordinary general meeting, or by completing, signing, dating and returning the enclosed proxy card in the postage-paid envelope provided. For the avoidance of doubt, the record date does not apply to SOAC shareholders that hold their shares in registered form and are registered as shareholders in SOAC's register of members. All holders of shares in registered form on the day of the extraordinary general meeting are entitled to vote at the extraordinary general meeting.

Q: IF MY SHARES ARE HELD IN "STREET NAME," WILL MY BROKER, BANK OR NOMINEE AUTOMATICALLY VOTE MY SHARES FOR ME?

A: No. If your shares are held in a stock brokerage account or by a bank or other nominee, you are considered the "beneficial holder" of the shares held for you in what is known as "street name." If this is the case, this proxy statement/prospectus may have been forwarded to you by your brokerage firm, bank or other nominee or its agent. As the beneficial holder, you have the right to direct your broker, bank or other nominee as to how to vote your shares. If you do not provide voting instructions to your broker on a particular proposal on which your broker does not have discretionary authority to vote, your shares will not be voted on that proposal. This is called a "broker non-vote." Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the extraordinary general meeting, and otherwise will have no effect on a particular proposal. If you decide to vote, you should provide instructions to your broker, bank or other nominee on how to vote in accordance with the information and procedures provided to you by your broker, bank or other nominee.

Q: WHEN AND WHERE WILL THE EXTRAORDINARY GENERAL MEETING BE HELD?

A: The extraordinary general meeting will be held at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP, located at 609 Main Street, Houston, Texas 77002, and via a virtual meeting, unless the extraordinary general meeting is adjourned.

Q: HOW WILL THE COVID-19 PANDEMIC IMPACT IN-PERSON VOTING AT THE GENERAL MEETING?

A: We intend to hold the extraordinary general meeting in person. However, we are sensitive to the public health and travel concerns our shareholders may have and recommendations that public health officials may issue in light of the evolving coronavirus ("COVID-19") situation. As a result, we may impose additional procedures or limitations on meeting attendees. We plan to announce any such updates in a press release filed with the SEC and posted on our proxy website at , and we encourage you to check this website prior to the meeting if you plan to attend.

Q: WHO IS ENTITLED TO VOTE AT THE EXTRAORDINARY GENERAL MEETING?

A: We have fixed , 2021 as the record date for the extraordinary general meeting. If you were a shareholder of SOAC at the close of business on the record date, you are entitled to vote on matters that come before the extraordinary general meeting. However, a shareholder may only vote his or her shares if he or she is present in person or is represented by proxy at the extraordinary general meeting.

Q: HOW MANY VOTES DO I HAVE?

A: SOAC shareholders are entitled to one (1) vote at the extraordinary general meeting for each ordinary share held of record as of the record date. As of the close of business on the record date for the extraordinary general meeting, there were 37,500,000 ordinary shares issued and outstanding, of which 30,000,000 were issued and outstanding public shares.

Q: WHAT CONSTITUTES A QUORUM?

A: A quorum of SOAC shareholders is necessary to hold a valid meeting. A quorum will be present at the extraordinary general meeting if one or more shareholders who together hold not less than a majority of the issued and outstanding ordinary shares entitled to vote at the extraordinary general meeting are represented in person or by proxy at the extraordinary general meeting. As of the record date for the extraordinary general meeting, 18,750,001 ordinary shares would be required to achieve a quorum.

Q: WHAT VOTE IS REQUIRED TO APPROVE EACH PROPOSAL AT THE EXTRAORDINARY GENERAL MEETING?

A: The following votes are required for each proposal at the extraordinary general meeting:

1. ***Continuance Proposal:*** The approval of the Continuance Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

2. ***Business Combination Proposal:*** The approval of the Business Combination Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

3. ***Charter Proposal***: The approval of the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter

4. ***Organizational Documents Proposals:*** The Organizational Documents Proposals are voted on a non-binding advisory basis.

5. ***NYSE Proposal:*** The approval of the NYSE Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

6. ***Incentive Award Plan Proposal:*** The approval of the Incentive Award Plan Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

7. ***Adjournment Proposal:*** The approval of the Adjournment Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

Assuming all holders that are entitled to vote on such matter vote all of their ordinary shares in person or by proxy, 18,750,001 shares will need to be voted in favor of each of the Business Combination Proposal, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal in order to approve each of the Business Combination Proposal, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal.

Assuming all holders that are entitled to vote on such matter vote all of their ordinary shares in person or by proxy, 25,000,000 shares will need to be voted in favor of the Continuance Proposal and the Charter Proposal in order to approve each of the Continuance Proposal and the Charter Proposal.

Q: WHAT ARE THE RECOMMENDATIONS OF THE SOAC BOARD?

A: The SOAC Board believes that the Business Combination Proposal and the other proposals to be presented at the extraordinary general meeting are in the best interest of SOAC and its shareholders and unanimously recommends that its shareholders vote "FOR" the Continuance Proposal, "FOR" the Business Combination Proposal, "FOR" the Charter Proposal, "FOR" the Organizational Documents Proposals, "FOR" the NYSE Proposal, "FOR" the Incentive Award Plan Proposal and "FOR" the Adjournment Proposal, in each case, if presented at the extraordinary general meeting.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

Q: HOW DO SPONSOR AND THE OTHER INITIAL SHAREHOLDERS INTEND TO VOTE THEIR SHARES?

A: Our initial shareholders have agreed to vote all their shares in favor of all the proposals being presented at the extraordinary general meeting in connection with the proposed Business Combination. As of the date of this proxy statement/prospectus, our initial shareholders own approximately 20% of the issued and outstanding ordinary shares.

At any time at or prior to the Business Combination, during a period when they are not then aware of any material, nonpublic information regarding us or our securities, our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates may purchase public shares from institutional and other investors who vote, or indicate an intention to vote, against any of the Condition Precedent Proposals, or execute agreements to purchase such shares from such investors in the future, or they may enter into transactions with such investors and others to provide them with incentives to acquire public shares or vote their public shares in favor of the Condition Precedent Proposals. Such a purchase may include a contractual acknowledgement that such shareholder, although still the record or beneficial holder of our shares, is no longer the beneficial owner thereof and therefore agrees not to exercise its redemption rights. In the event that our initial shareholders, TMC and/or their directors, officers, advisors or respective affiliates purchase shares in privately negotiated transactions from public shareholders who have already elected to exercise their redemption rights, such selling shareholder would be required to revoke their prior elections to redeem their

shares. The purpose of such share purchases and other transactions would be to increase the likelihood of satisfaction of the requirements that (i) the Business Combination Proposal, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal are approved by the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, and (ii) the Continuance Proposal and the Charter Proposal are approved by the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, or otherwise limit the number of public shares electing to redeem.

Entering into any such arrangements may have a depressive effect on the ordinary shares. For example, as a result of these arrangements, an investor or holder may have the ability to effectively purchase shares at a price lower than market and may therefore be more likely to sell the shares he or she owns, either at or prior to the Business Combination.

If such transactions are effected, the consequence could be to cause the Business Combination to be consummated in circumstances where such consummation could not otherwise occur. Purchases of shares by the persons described above would allow them to exert more influence over the approval of the proposals to be presented at the extraordinary general meeting and would likely increase the chances that such proposals would be approved. We will file or submit a Current Report on Form 8-K to disclose any material arrangements entered into or significant purchases made by any of the aforementioned persons that would affect the vote on the proposals to be put to the extraordinary general meeting or the redemption threshold.

Any such report will include descriptions of any arrangements entered into or significant purchases by any of the aforementioned persons.

Q: WHAT HAPPENS IF I SELL MY SOAC ORDINARY SHARES BEFORE THE EXTRAORDINARY GENERAL MEETING?

A: The record date for the extraordinary general meeting is earlier than the date of the extraordinary general meeting and earlier than the date that the Business Combination is expected to be completed. If you transfer your public shares after the applicable record date, but before the extraordinary general meeting, unless you grant a proxy to the transferee, you will retain your right to vote at such general meeting.

Q: MAY I CHANGE MY VOTE AFTER I HAVE MAILED MY SIGNED PROXY CARD?

A: Yes. Shareholders may send a later-dated, signed proxy card to our general counsel at our address set forth below so that it is received by our general counsel prior to the vote at the extraordinary general meeting (which is scheduled to take place on , 2021) or attend the extraordinary general meeting in person and vote. Shareholders also may revoke their proxy by sending a notice of revocation to our general counsel, which must be received by our general counsel prior to the vote at the extraordinary general meeting. However, if your shares are held in "street name" by your broker, bank or another nominee, you must contact your broker, bank or other nominee to change your vote.

Q: WHAT HAPPENS IF I FAIL TO TAKE ANY ACTION WITH RESPECT TO THE EXTRAORDINARY GENERAL MEETING?

A: If you fail to vote with respect to the extraordinary general meeting and the Business Combination is approved by shareholders and consummated, you will become a shareholder and/or optionholder and/or warrant holder of TMC. If you fail to vote with respect to the extraordinary general meeting and the Business Combination is not approved, you will remain a shareholder and/or warrant holder of SOAC. However, if you fail to vote with respect to the extraordinary general meeting, you will nonetheless be able to elect to redeem your public shares in connection with the Business Combination.

Q: WHAT SHOULD I DO IF I RECEIVE MORE THAN ONE SET OF VOTING MATERIALS?

A: Shareholders may receive more than one set of voting materials, including multiple copies of this proxy statement/prospectus and multiple proxy cards or voting instruction cards. For example, if you hold your shares in more than one brokerage account, you will receive a separate voting instruction card for each

brokerage account in which you hold shares. If you are a holder of record and your shares are registered in more than one name, you will receive more than one proxy card. Please complete, sign, date and return each proxy card and voting instruction card that you receive in order to cast a vote with respect to all of your ordinary shares.

Q: WHO WILL SOLICIT AND PAY THE COST OF SOLICITING PROXIES FOR THE EXTRAORDINARY GENERAL MEETING?

A: SOAC will pay the cost of soliciting proxies for the extraordinary general meeting. SOAC has engaged Morrow Sodali LLC ("Morrow") to assist in the solicitation of proxies for the extraordinary general meeting. SOAC has agreed to pay Morrow a fee of $, plus disbursements, and will reimburse Morrow for its reasonable out-of-pocket expenses and indemnify Morrow and its affiliates against certain claims, liabilities, losses, damages and expenses. SOAC will also reimburse banks, brokers and other custodians, nominees and fiduciaries representing beneficial owners of Class A ordinary shares for their expenses in forwarding soliciting materials to beneficial owners of Class A ordinary shares and in obtaining voting instructions from those owners. SOAC's directors and officers may also solicit proxies by telephone, by facsimile, by mail, on the Internet or in person. They will not be paid any additional amounts for soliciting proxies.

Q: WHERE CAN I FIND THE VOTING RESULTS OF THE EXTRAORDINARY GENERAL MEETING?

A: The preliminary voting results will be announced at the extraordinary general meeting. SOAC will publish final voting results of the extraordinary general meeting in a Current Report on Form 8-K within four business days after the extraordinary general meeting.

Q: WHO CAN HELP ANSWER MY QUESTIONS?

A: If you have questions about the Business Combination or if you need additional copies of the proxy statement/prospectus or the enclosed proxy card you should contact:

Morrow Sodali LLC
470 West Avenue
Stamford CT 06902
Individuals call toll-free (800) 662-5200
Banks and brokers call (203) 658-9400
Email: SOAC.info@investor.morrowsodali.com

You also may obtain additional information about SOAC from documents filed with the SEC by following the instructions in the section entitled *"Where You Can Find More Information; Incorporation by Reference."* If you are a holder of public shares and you intend to seek redemption of your public shares, you will need to deliver your public shares (either physically or electronically) to Continental at the address below prior to the extraordinary general meeting. **Holders must complete the procedures for electing to redeem their public shares in the manner described above prior to 5:00 p.m., Eastern Time, on (two business days before the extraordinary general meeting) in order for their shares to be redeemed.** If you have questions regarding the certification of your position or delivery of your shares, please contact:

Continental Stock Transfer & Trust Company
One State Street Plaza, 30th Floor
New York, NY 10004
Attn: Mark Zimkind
E-mail: mzimkind@continentalstock.com

SUMMARY

This summary highlights selected information from this proxy statement/prospectus and does not contain all of the information that is important to you. To better understand the proposals to be submitted for a vote at the extraordinary general meeting, including the Business Combination, you should read this proxy statement/prospectus, *including the Annexes and other documents referred to herein, carefully and in their entirety. The Business Combination Agreement is the legal document that governs the Business Combination and the other transactions that will be undertaken in connection with the Business Combination. The Business Combination Agreement is also described in detail in this proxy statement/prospectus in the section entitled "Business Combination Proposal — The Business Combination Agreement."*

Business Summary

Unless otherwise indicated or the context otherwise requires, references in this Business Summary to "we," "us," "our" and other similar terms refer to DeepGreen and its subsidiaries prior to the Business Combination and to TMC and its consolidated subsidiaries after giving effect to the Business Combination.

DeepGreen Overview

DeepGreen is a deep-sea minerals exploration company focused on the collection, processing and refining of polymetallic nodules found on the seafloor of the Clarion Clipperton Zone of the Pacific Ocean (the "CCZ"). Polymetallic nodules, which are located in significant quantities on the seafloor of the CCZ, have high concentrations of nickel, manganese, cobalt and copper in a single rock. These metals are the main raw material inputs into lithium NMC (nickel-manganese-cobalt) battery cathodes and electric wiring often used in electric vehicles ("EV") and energy storage. DeepGreen has identified the potential to recover metals from polymetallic nodules to support increasing demand from battery and electric vehicle production through the development of a process that produces metals from the polymetallic nodules with near-zero solid processing waste. DeepGreen has a dual mission: (1) to supply metals for the clean energy transition with low environmental and social impact; and (2) to accelerate the transition to a circular metal economy. The primary application of DeepGreen's mission is to solve the metals supply problem for the manufacture of EV batteries.

NORI and TOML, both subsidiaries of DeepGreen, intend to operate under the effective supervision, regulation and sponsorship of the Republic of Nauru ("Nauru") and the Kingdom of Tonga ("Tonga"), respectively, in the CCZ. DeepGreen intends to engage in processing operations through its subsidiary DeepGreen Engineering in locations that have yet to be determined. DeepGreen has chosen an asset-light approach to its operations and has focused on forming deep strategic partnerships with leading offshore companies in every aspect of its operations.

The Parties to the Business Combination

SOAC

SOAC is a blank check company incorporated on December 18, 2019 as a Cayman Islands exempted company limited by shares and formed for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses. SOAC is an emerging growth company and, as such, SOAC is subject to all of the risks associated with emerging growth companies. As of March 31, 2021, SOAC had not commenced any operations. All of SOAC's activities have related to its formation and initial public offering, and since the closing of the initial public offering, a search for a business combination candidate.

On May 8, 2020, SOAC consummated an initial public offering of 30,000,000 units at an offering price of $10.00 per unit, and a private placement with Sponsor of 9,500,000 Private Placement Warrants at an offering price of $1.00 per warrant.

Following the closing of SOAC's initial public offering, an amount equal to $300,000,000 of the net proceeds from its initial public offering and the sale of the Private Placement Warrants was placed in the trust account, and invested only in U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by SOAC meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of

the Investment Company Act, as determined by SOAC, until the earlier of: (i) the completion of a business combination and (ii) the distribution of the trust account if SOAC does not complete a business combination within 18 months from the closing of the initial public offering, or November 8, 2021 (the "Combination Period"), unless the SOAC proposes an amendment to SOAC's existing Amended and Restated Memorandum and Articles of Association that would affect the substance or timing of SOAC's obligation to complete a business combination within the Combination Period and SOAC provides its shareholders with the opportunity to redeem their Class A ordinary shares in conjunction with any such amendment.

SOAC's units, public shares and public warrants are currently listed on the NYSE under the symbols "SOAC.U," "SOAC" and "SOAC WS," respectively.

SOAC's registered office is located at 1601 Bryan Street, Suite 4141, Dallas, Texas 75201. SOAC's corporate website address is *https://www.greenspac.com*. SOAC's website and the information contained on, or that can be accessed through, the website is not deemed to be incorporated by reference in, and is not considered part of, this proxy statement/prospectus.

DeepGreen

DeepGreen is a corporation existing under the laws of British Columbia, Canada. DeepGreen's corporate website address is *https://deep.green/*. DeepGreen's website and the information contained on, or that can be accessed through, the website is not deemed to be incorporated by reference in, and is not considered part of, this proxy statement/prospectus.

NewCo Sub

1291924 B.C. Unlimited Liability Company is a British Columbia unlimited liability company and wholly-owned subsidiary of SOAC that was formed for the sole purpose of effecting the Business Combination. Its registered office is located at 666 Burrard Street, Vancouver, British Columbia, Canada.

Proposals to be put to the Shareholders of SOAC at the Extraordinary General Meeting of SOAC

The following is a summary of the proposals to be put to the extraordinary general meeting of SOAC and certain transactions contemplated by the Business Combination Agreement. Each of the Condition Precedent Proposals is cross-conditioned on the approval of each other. The Adjournment Proposal is not conditioned upon the approval of any other proposal set forth in this proxy statement/prospectus. The transactions contemplated by the Business Combination Agreement will be consummated only if the Condition Precedent Proposals are approved at the extraordinary general meeting.

Continuance Proposal

As discussed in this proxy statement/prospectus, SOAC will ask its shareholders to approve by special resolution the Continuance Proposal. As a condition to closing the Business Combination pursuant to the terms of the Business Combination Agreement, the board of directors of SOAC has unanimously approved the Continuance Proposal. The Continuance Proposal, if approved, will authorize a change of SOAC's jurisdiction of incorporation from the Cayman Islands to British Columbia, Canada. Accordingly, while SOAC is currently incorporated as an exempted company under the Cayman Islands Companies Law, upon the Continuance, TMC will be governed by the BCBCA. There are differences between Cayman Islands corporate law and British Columbia corporate law as well as the Existing Governing Documents and the TMC Notice and Articles. The approval of each of the Continuance Proposal and the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of holders at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. Accordingly, we encourage shareholders to carefully consult the information set out below under "*Comparison of Corporate Governance and Shareholder Rights*."

For further details, see "*Continuance Proposal*."

The Business Combination Proposal

As discussed in this proxy statement/prospectus, SOAC is asking its shareholders to approve by ordinary resolution the Business Combination Agreement, pursuant to which, among other things, on the Closing Date, promptly following the Continuance, pursuant to the Arrangement, (i) SOAC will acquire all of the issued and outstanding DeepGreen Common Shares, (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and DeepGreen Options, as applicable, the following shares or options to purchase the following shares: an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the effective time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia. In addition, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms.

After consideration of the factors identified and discussed in the section entitled "*Business Combination Proposal — The SOAC Board's Reasons for the Business Combination,*" the SOAC Board concluded that the Business Combination met all of the requirements disclosed in the prospectus for SOAC's initial public offering, including that the businesses of DeepGreen had a fair market value of at least 80% of the balance of the funds in the trust account at the time of execution of the Business Combination Agreement. For more information about the transactions contemplated by the Business Combination Agreement, see "*Business Combination Proposal*."

Consideration to Existing DeepGreen Securityholders in the Business Combination

In accordance with the terms and subject to the conditions of the Business Combination Agreement, pursuant to the Plan of Arrangement, the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares or DeepGreen Options, as applicable the following shares or options to purchase the following shares: an aggregate of: (i) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the effective time of approximately $2.3 billion, and (ii) DeepGreen Earnout Shares. In addition, upon the consummation of the Business Combination, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares in accordance with its terms. The TMC Common Shares and DeepGreen Earnout Shares to be issued to Existing DeepGreen Securityholders pursuant to the Arrangement will not be registered under the Securities Act and will be issued pursuant to the exemption provided by Section 3(a)(10) under the Securities Act.

For further details, see "*Business Combination Proposal — Business Combination Consideration*."

Conditions to Closing of the Business Combination

The consummation of the Business Combination is conditioned upon ,among other things, (i) the approval by our shareholders of the Condition Precedent Proposals being obtained; (ii) the approval by the securityholders of DeepGreen of the DeepGreen Arrangement Resolution being obtained; (iii) the Final Order being obtained on terms consistent with the Business Combination Agreement; (iv) the Aggregate Transaction Proceeds Condition being fulfilled; (v) the approval by the NYSE of our initial listing application in connection with the Business Combination and (vi) the Net Tangible Assets Condition being fulfilled. The Aggregate Transaction Proceeds Condition and the Net Tangible Assets Condition are expected to be satisfied by the closing of the PIPE Financing. For further details, see "*Business Combination Proposal — Conditions to Closing of the Business Combination.*"

The Charter Proposal

SOAC is proposing that its shareholders approve the TMC Notice and Articles as the governing documents of TMC as a result of and upon the Continuance, reflecting the authorized share capital described therein and the change of name of SOAC to "TMC the metals company Inc." upon the Continuance. For further details, see "*The Charter Proposal*."

The Organizational Document Proposals

SOAC is proposing that its shareholders approve, on a non-binding basis, six separate proposals in connection with the replacement with the Existing Governing Documents under Cayman Islands law, with the TMC Notice and

Articles under the BCBCA. The SOAC Board has unanimously approved each of the Organizational Documents Proposals and believes such proposals are necessary to adequately address the needs of TMC after the Business Combination. A brief summary of each of the Organizational Documents Proposals is set forth below. These summaries are qualified in their entirety by reference to the complete text of the TMC Notice and Articles.

- *Organizational Documents Proposal 4A* — The establishment of the authorized capital of TMC to consist of an unlimited number of common shares, an unlimited number of preferred shares, issuable in series, and the TMC Special Shares, in each case, without par value.
- *Organizational Documents Proposal 4B* — the declassification of the board of directors with the result being that each director will be elected on an annual basis.
- *Organizational Documents Proposal 4C* — the reduction of the requisite quorum for a meeting of shareholders from a majority to at least two shareholders representing no less than one-third ($33^{1/3}$%) of the shares entitled to vote at such meeting.
- *Organizational Documents Proposal 4D* — the inclusion of an advance notice provision that requires a shareholder to provide notice to TMC in advance of a meeting of shareholders should such shareholder wish to nominate a person for election to the board of directors.
- *Organizational Documents Proposal 4E* — the inclusion of a forum selection provision whereby, subject to limited exceptions or unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada, and the appellate courts therefrom, will be the sole and exclusive forum for certain shareholder litigation matters.
- *Organizational Documents Proposal 4F* — certain other changes, including the changes in the rights and restrictions attached to the Class B ordinary shares, and the deletion of the provisions relating to the initial public offering, the Sponsors, the initial business combination and other related matters.

The TMC Notice and Articles differ in certain material respects from the Existing Governing Documents and we encourage shareholders to carefully consult the information set forth in the section entitled "Organizational Documents Proposals" and the full text of the TMC Notice and Articles, attached hereto as Annexes B and C, respectively.

For further details, see "*Proposal 4 — Organizational Documents Proposals.*"

NYSE Proposal

Our shareholders are also being asked to approve, by ordinary resolution, the NYSE Proposal. Our units, public shares and public warrants are listed on NYSE and, as such, we are seeking shareholder approval for issuance of TMC Common Shares in connection with the Business Combination and the PIPE Financing pursuant to NYSE Rule 312.03. SOAC will apply for listing, to be effective at the Effective Time, of TMC Common Shares and Warrants on NASDAQ.

For additional information, see "*Proposal No. 5 — NYSE Proposal*."

Incentive Award Plan Proposal

Our shareholders are also being asked to approve, by ordinary resolution, the Incentive Award Plan Proposal. Pursuant to the Incentive Equity Plan, a number of TMC Common Shares, representing 11% of the number of outstanding TMC Common Shares as of the date of closing of the Business Combination, will be available for issuance with respect to awards under the Incentive Equity Plan. Notwithstanding the foregoing, the number of shares that may be issued will increase automatically on the first day of each fiscal year during the period beginning with fiscal year 2022 and ending on the tenth anniversary of the closing of the Business Combination by an amount equal to the lesser of (a) 4% of the number of outstanding TMC Common Shares on such date, and (b) an amount determined by the plan administrator. For additional information, see "*Incentive Award Plan Proposal*." The full text of the TMC Incentive Equity Plan is attached hereto as Annex D.

Adjournment Proposal

If, based on the tabulated vote, there are not sufficient votes at the time of the extraordinary general meeting to authorize SOAC to consummate the Business Combination, the SOAC Board may submit a proposal to adjourn the extraordinary general meeting to a later date or dates to consider and vote upon a proposal to approve by ordinary resolution the adjournment of the extraordinary general meeting to a later date or dates. For additional information, see "*Adjournment Proposal*."

Each of the Continuance Proposal, the Business Combination Proposal, the Charter Proposal, the NYSE Proposal and the Incentive Award Plan Proposal is conditioned on the approval and adoption of each of the Condition Precedent Proposals. The Adjournment Proposal is not conditioned on any other proposal.

The SOAC Board's Reasons for the Business Combination

SOAC was formed for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses or entities. The SOAC Board sought to do this by utilizing the networks and industry experience of Sponsor, the SOAC Board and management to identify, acquire and operate one or more businesses. The members of management and the SOAC Board have extensive experience in operating and investing in companies with a focus on decarbonization and environmentally sustainable business practices.

In particular, the SOAC Board considered the following positive factors, although not weighted in or in any order of significance, in deciding to approve the Business Combination Proposal:

- Meets the acquisition criteria that SOAC had established to evaluate prospective business combination targets;
- DeepGreen has access to clean and inexpensive sources of battery materials;
- DeepGreen has established strategic partnerships;
- DeepGreen has unique exposure to attractive tailwinds in a growing electric vehicle market;
- Attractive enterprise valuation of DeepGreen; and
- DeepGreen has an experienced management team.

For more information about the SOAC Board's decision-making process concerning the Business Combination, please see the section entitled "*The Business Combination Proposal — The SOAC Board's Reasons for the Business Combination*."

Related Agreements

This section describes certain additional agreements entered into or to be entered into in connection with the Business Combination Agreement. For additional information, see "*Business Combination Proposal — Related Agreements.*"

PIPE Financing

SOAC entered into Subscription Agreements with the PIPE Investors to consummate the PIPE Financing, pursuant to which the PIPE Investors have agreed to subscribe for and purchase, and SOAC has agreed to issue and sell to the PIPE Investors, an aggregate of 33,030,000 TMC Common Shares at a price of $10.00 per share, for aggregate gross proceeds of $330,300,000. The TMC Common Shares to be issued pursuant to the Subscription Agreements have not been registered under the Securities Act in reliance upon the exemption provided in Section 4(a)(2) of the Securities Act. SOAC will grant the PIPE Investors certain registration rights in connection with the PIPE Financing. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination. For additional information, see "*Business Combination Proposal — Related Agreements — PIPE Financing*."

Amended and Restated Registration Rights Agreement

At the Closing, SOAC, the initial shareholders, and certain Existing DeepGreen Securityholders will enter into an Amended and Restated Registration Rights Agreement (the "Amended and Restated Registration Rights Agreement"), pursuant to which, among other things, the initial shareholders and certain Existing DeepGreen Securityholders (a) will agree not to effect any sale or distribution of certain securities of TMC held by them during the lock-up periods described therein and (b) will be granted certain customary registration rights. Notably, certain shares held by the initial holders shall not be offered, sold, pledged or distributed for periods of six months or twelve months, as applicable, and certain shares held by the Existing DeepGreen Securityholders shall not be offered, sold, pledged or distributed for periods of six months or two years, as applicable, subject to the exceptions described in the Amended and Restated Registration Rights Agreement. For additional information, see "*Business Combination Proposal — Related Agreements — Registration Rights Agreement*."

Transaction Support Agreements

Concurrently with the execution of the Business Combination Agreement, certain DeepGreen Securityholders entered into shareholder support agreements (the "Transaction Support Agreements") pursuant to which each such holder agreed (i) to vote at any meeting of the DeepGreen Securityholders all of its securities held of record or thereafter acquired and entitled to vote in favor of the Business Combination and the ancillary documents thereto and the consummation of the Arrangement and the transactions contemplated thereby, (ii) irrevocably appoint SOAC or any individual designated by SOAC as such DeepGreen Securityholder's attorney-in-fact, with full power of substitution in favor of SOAC, to take all such actions and execute and deliver such documents, instruments or agreements as are necessary to consummate the transaction contemplated by the Business Combination Agreement, including acting as a proxy, to attend on behalf of such DeepGreen Securityholder, at any meeting of DeepGreen Securityholders with respect to the Business Combination, (iii) be bound by certain other covenants and agreements related to the Business Combination, and (iv) not to transfer such securities outside certain limited circumstances. For additional information, see "*Business Combination Proposal — Related Agreements — Transaction Support Agreements*."

Sponsor Letter Agreement

Pursuant to the Business Combination Agreement, Sponsor, Rick Gaenzle, Isaac Barchas and Justin Kelly and DeepGreen entered into the Sponsor Letter Agreement (the "Sponsor Letter Agreement"), pursuant to which (a) Sponsor and each of Rick Gaenzle, Isaac Barchas and Justin Kelly has agreed to, among other things, (i) vote in favor of the Business Combination Agreement and the transactions contemplated thereby, (ii) waive any adjustment to the conversion ratio set forth in the governing documents of SOAC or any other anti-dilution or similar protection with respect to the Class B ordinary shares (whether resulting from the transactions contemplated by the Subscription Agreements or otherwise), (iii) be bound by certain other covenants and agreements related to the Business Combination and (iv) be bound by certain transfer restrictions with respect to his, her or its shares in SOAC prior to the closing of the Business Combination and (b) Sponsor has agreed to exchange 741,000 of its TMC Common Shares upon the Continuance for the Sponsor Earnout Shares at the Effective Time, in each case, on the terms and subject to the conditions set forth in the Sponsor Letter Agreement. "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*."

Ownership of TMC

As of the date of this proxy statement/prospectus, there are (i) 30,000,000 Class A ordinary shares outstanding underlying units issued in SOAC's initial public offering, and (iii) 7,500,000 Class B ordinary shares outstanding held by SOAC's initial shareholders. As of the date of this proxy statement/prospectus, there are outstanding 9,500,000 private placement warrants held by Sponsor and 15,000,000 public warrants. Each whole warrant entitles the holder thereof to purchase one Class A ordinary share and, following the Continuance, will entitle the holder thereof to purchase one TMC Common Share. Therefore, as of the date of this proxy statement/prospectus (without giving effect to the Business Combination and assuming that none of SOAC's outstanding public shares are redeemed in connection with the Business Combination), SOAC's fully-diluted share capital, giving effect to the exercise of all of the private placement warrants and public warrants, would be 62,000,000 ordinary shares.

The following table illustrates varying ownership levels in TMC Common Shares immediately following the consummation of the Business Combination based on the varying levels of redemptions by the public shareholders and the following additional assumptions: (i) 230,600,000 TMC Common Shares are issued to the holders of DeepGreen Common Shares and the holders of the DeepGreen Options (assuming exercise prior to the Effective Time), which would be the number of TMC Common Shares issued to these holders if the Adjusted Equity Value

immediately prior to the Effective Date was approximately $2.3 billion; (iii) no public warrants or private placement warrants to purchase TMC Common Shares that will be outstanding immediately following Closing are exercised; (iv) the Allseas Warrant exercisable for TMC Common Shares upon the consummation of the Business Combination is not exercised; and (v) no TMC Special Shares are converted to TMC Common Shares. If the actual facts are different than these assumptions, the ownership percentages in TMC will be different.

	Share Ownership in TMC	
	No redemptions	Maximum redemptions[1]
	Percentage of Outstanding Shares	Percentage of Outstanding Shares
SOAC public shareholders	10.0%	0.0%
Our initial shareholders[2]	2.3%	2.5%
PIPE Investors	11.0%	12.2%
Existing DeepGreen Securityholders[3]	76.7%	85.3%

(1) Assumes that all of SOAC's outstanding public shares are redeemed in connection with the Business Combination, in which case the Aggregate Transaction Proceeds Condition and the Net Tangible Assets Condition are expected to be satisfied by the closing of the PIPE Financing.

(2) Includes 6,759,000 TMC Common Shares that will be issued to the holders of the existing Class B ordinary shares as a result and upon the consummation of the Continuance, and excludes 741,000 TMC Common Shares that are expected to be exchanged for Sponsor Earnout Shares at the Effective Time. Also excludes the TMC Common Shares that are issuable upon conversion of the Sponsor Earnout Shares.

(3) Represents 230,600,000 TMC Common Shares to be issued pursuant to the Arrangement and excludes the TMC Common Shares that are issuable upon the conversion of the DeepGreen Earnout Shares.

Date, Time and Place of the Extraordinary General Meeting of SOAC

The extraordinary general meeting of SOAC, will be held at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP, located at 609 Main Street, Houston, Texas 77002, and via a virtual meeting, to consider and vote upon the proposals to be put to the extraordinary general meeting, including if necessary, the Adjournment Proposal, to permit further solicitation and vote of proxies if, based upon the tabulated vote at the time of the extraordinary general meeting, each of the Condition Precedent Proposals have not been approved.

Voting Power; Record Date

SOAC shareholders will be entitled to vote or direct votes to be cast at the extraordinary general meeting if they owned ordinary shares at the close of business on , 2021, which is the "record date" for the extraordinary general meeting. Shareholders will have one (1) vote for each ordinary share owned at the close of business on the record date. If your shares are held in "street name" or are in a margin or similar account, you should contact your broker to ensure that votes related to the shares you beneficially own are properly counted. Our warrants do not have voting rights. As of the close of business on the record date, there were 37,500,000 ordinary shares issued and outstanding, of which 30,000,000 were issued and outstanding public shares.

Quorum and Vote of SOAC Shareholders

A quorum of SOAC shareholders is necessary to hold a valid meeting. A quorum will be present at the extraordinary general meeting if one or more shareholders who together hold not less than a majority of the issued and outstanding ordinary shares entitled to vote at the extraordinary general meeting are represented in person or by proxy at the extraordinary general meeting. As of the record date for the extraordinary general meeting, 18,750,001 ordinary shares would be required to achieve a quorum.

The initial shareholders have, pursuant to the Sponsor Letter Agreement, agreed to, among other things, vote all of their ordinary shares in favor of the proposals being presented at the extraordinary general meeting. As of the date of this proxy statement/prospectus, the initial shareholders own approximately 20% of the issued and outstanding ordinary shares. See "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*" in the accompanying proxy statement/prospectus for more information related to the Sponsor Letter Agreement.

The proposals presented at the extraordinary general meeting require the following votes:

(i) *Continuance Proposal:* The approval of the Continuance Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

(ii) *Business Combination Proposal:* The approval of the Business Combination Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

(iii) *Charter Proposal*: The approval of the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

(iv) *Organizational Documents Proposals:* The Organizational Documents Proposals are voted on a non-binding advisory basis.

(v) *NYSE Proposal:* The approval of the NYSE Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

(vi) *Incentive Award Plan Proposal:* The approval of the Incentive Award Plan Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

(vii) *Adjournment Proposal:* The approval of the Adjournment Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

Redemption Rights

Pursuant to the Existing Governing Documents, a public shareholder may request of SOAC that SOAC redeem all or a portion of its public shares for cash if the Business Combination is consummated. As a holder of public shares, you will be entitled to receive cash for any public shares to be redeemed only if you:

(i) (a) hold public shares, or (b) if you hold public shares through units, you elect to separate your units into the underlying public shares and public warrants prior to exercising your redemption rights with respect to the public shares;

(ii) submit a written request to Continental in which you (i) request that we redeem all or a portion of your public shares for cash, and (ii) identify yourself as the beneficial holder of the public shares and provide your legal name, phone number and address; and

(iii) deliver your public shares to Continental physically or electronically through The Depository Trust Company ("DTC").

Holders must complete the procedures for electing to redeem their public shares in the manner described above prior to 5:00 p.m., Eastern Time, on , 2021 (two business days before the extraordinary general meeting) in order for their shares to be redeemed.

Holders of units must elect to separate the units into the underlying public shares and public warrants prior to exercising redemption rights with respect to the public shares. If holders hold their units in an account at a brokerage firm or bank, holders must notify their broker or bank that they elect to separate the units into the underlying public shares and public warrants, or if a holder holds units registered in its own name, the holder must contact Continental, our transfer agent, directly and instruct them to do so.

Public shareholders will be entitled to request that their public shares be redeemed for a pro rata portion of the amount then on deposit in the trust account as of two business days prior to the consummation of the Business Combination including interest earned on the funds held in the trust account and not previously released to us (net of taxes payable). For illustrative purposes, as of , 2021, this would have amounted to approximately $ per issued and outstanding public share. However, the proceeds deposited in the trust account could become subject to the claims of our creditors, if any, which could have priority over the claims of our public shareholders, regardless of whether such public shareholders vote or, if they do vote, irrespective of if they vote for or against the Business Combination Proposal. Therefore, the per share distribution from the trust account in such a situation may be less than originally expected due to such claims. Public shareholders are not required to affirmatively vote for or against the Business Combination Proposal or any of the other proposals set forth in this proxy statement/prospectus in order to redeem their public shares for cash. This means that public shareholders (other than those who have agreed not to do so by executing the Sponsor Letter Agreement) who hold public shares on or before , 2021 (two (2) business days before the extraordinary general meeting) may elect to redeem their public shares whether or not they are holders as of the record date, and whether or not they vote "FOR" the Business Combination Proposal or any of the other proposals set forth in this proxy statement/prospectus. It is expected that the funds to be distributed to public shareholders electing to redeem their public shares will be distributed promptly after the consummation of the Business Combination.

Any request for redemption, once made by a holder of public shares, may be withdrawn at any time up to the time the vote is taken with respect to the Business Combination Proposal at the extraordinary general meeting. If you deliver your shares for redemption to Continental, our transfer agent, and later decide prior to the extraordinary general meeting not to elect redemption, you may request that our transfer agent return the shares (physically or electronically) to you. You may make such request by contacting Continental, our transfer agent, at the phone number or address listed at the end of this section.

Any corrected or changed written exercise of redemption rights must be received by Continental, our transfer agent, prior to the vote taken on the Business Combination Proposal at the extraordinary general meeting. **No request for redemption will be honored unless the holder's public shares have been delivered (either physically or electronically) to Continental, our transfer agent, at least two business days prior to the vote at the extraordinary general meeting.**

If a holder of public shares properly makes a request for redemption and the public shares are delivered as described above, then, if the Business Combination is consummated, we will redeem the public shares for a pro rata portion of funds deposited in the trust account, calculated as of two business days prior to the consummation of the Business Combination.

If you are a holder of public shares and you exercise your redemption rights, such exercise will not result in the loss of any warrants that you may hold.

Appraisal Rights

Neither SOAC shareholders nor SOAC warrant holders have appraisal rights in connection with the Business Combination under the Cayman Islands Companies Law or under the BCBCA.

Proxy Solicitation

Proxies may be solicited by mail, telephone or in person. SOAC has engaged Morrow to assist in the solicitation of proxies.

If a shareholder grants a proxy, it may still vote its shares in person if it revokes its proxy before the extraordinary general meeting. A shareholder also may change its vote by submitting a later-dated proxy as described in the section entitled "*Extraordinary General Meeting of SOAC — Revoking Your Proxy*."

Interests of SOAC Directors and Executive Officers in the Business Combination

When you consider the recommendation of the SOAC Board in favor of approval of the Business Combination Proposal, you should keep in mind that the initial shareholders, including SOAC's directors and executive officers, have interests in such proposal that are different from, or in addition to, those of SOAC shareholders and warrant holders generally. These interests include, among other things, the interests listed below:

- the fact that our initial shareholders have agreed not to redeem any Class A ordinary shares held by them in connection with a shareholder vote to approve a proposed initial business combination;
- the fact that Sponsor paid an aggregate of $25,000 for the 7,500,000 Class B ordinary shares currently owned by the initial shareholders and such securities will have a significantly higher value at the time of the Business Combination;
- the fact that Sponsor paid $9,500,000 for its private placement warrants, and the Class A ordinary shares underlying those warrants would be worthless if a business combination is not consummated by November 8, 2021 (unless such date is extended in accordance with the Existing Governing Documents);
- the fact that the initial shareholders and SOAC's other current officers and directors have agreed to waive their rights to liquidating distributions from the trust account with respect to any ordinary shares (other than public shares) held by them if SOAC fails to complete an initial business combination by November 8, 2021;
- the fact that the Amended and Restated Registration Rights Agreement will be entered into by Sponsor and Messrs. Gaenzle, Barchas and Kelly;
- the right of Sponsor and Messrs. Gaenzle, Barchas and Kelly to hold TMC Common Shares following the Business Combination, subject to certain lock-up periods;
- the right of Sponsor to hold Sponsor Earnout Shares following the Business Combination;
- the fact that, at the option of Sponsor and with DeepGreen's consent, any amounts outstanding under any loan made by Sponsor or any of its affiliates to SOAC in an aggregate amount of up to $1,500,000 may be converted into warrants to purchase Class A ordinary shares in connection with the consummation of the Business Combination;
- the continued indemnification of SOAC's directors and officers and the continuation of SOAC's directors' and officers' liability insurance after the Business Combination (i.e., a "tail policy");
- the fact that Sponsor and SOAC's officers and directors will lose their entire investment in SOAC and will not be reimbursed for any out-of-pocket expenses if an initial business combination is not consummated by November 8, 2021;
- the fact that if the trust account is liquidated, including in the event SOAC is unable to complete an initial business combination by November 8, 2021, Sponsor has agreed to indemnify SOAC to ensure that the proceeds in the trust account are not reduced below $10.00 per public share, or such lesser per public share amount as is in the trust account on the liquidation date, by the claims of prospective target businesses with which SOAC has entered into an acquisition agreement or claims of any third party for services rendered or products sold to SOAC, but only if such a vendor or target business has not executed a waiver of any and all rights to seek access to the trust account; and
- the fact that SOAC may be entitled to distribute or pay over funds held by SOAC outside the trust account to Sponsor or any of its affiliates prior to the Closing.

The initial shareholders have, pursuant to the Sponsor Letter Agreement, agreed to, among other things, vote all of their ordinary shares in favor of the proposals being presented at the extraordinary general meeting and waive their anti-dilution rights with respect to their Class B ordinary shares in connection with the consummation of the Business Combination. Such shares will be excluded from the pro rata calculation

used to determine the per-share redemption price. As of the date of this proxy statement/prospectus, the initial shareholders own approximately 20% of the issued and outstanding ordinary shares. See "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*" in the accompanying proxy statement/prospectus for more information related to the Sponsor Letter Agreement.

At any time at or prior to the Business Combination, during a period when they are not then aware of any material, nonpublic information regarding us or our securities, our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates may purchase public shares from institutional and other investors who vote, or indicate an intention to vote, against any of the Condition Precedent Proposals, or execute agreements to purchase such shares from such investors in the future, or they may enter into transactions with such investors and others to provide them with incentives to acquire public shares or vote their public shares in favor of the Condition Precedent Proposals. Such a purchase may include a contractual acknowledgement that such shareholder, although still the record or beneficial holder of our shares, is no longer the beneficial owner thereof and therefore agrees not to exercise its redemption rights. In the event that our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates purchase shares in privately negotiated transactions from public shareholders who have already elected to exercise their redemption rights, such selling shareholder would be required to revoke their prior elections to redeem their shares. The purpose of such share purchases and other transactions would be to increase the likelihood of satisfying the requirements that (i) the Business Combination Proposal, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal are approved by the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, and (ii) the Continuance Proposal and the Charter Proposal are approved by the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, or otherwise limit the number of public shares electing to redeem.

Entering into any such arrangements may have a depressive effect on the ordinary shares. For example, as a result of these arrangements, an investor or holder may have the ability to effectively purchase shares at a price lower than market and may therefore be more likely to sell the shares he or she owns, either at or prior to the Business Combination.

If such transactions are effected, the consequence could be to cause the Business Combination to be consummated in circumstances where such consummation could not otherwise occur. Purchases of shares by the persons described above would allow them to exert more influence over the approval of the proposals to be presented at the extraordinary general meeting and would likely increase the chances that such proposals would be approved. We will file or submit a Current Report on Form 8-K to disclose any material arrangements entered into or significant purchases made by any of the aforementioned persons that would affect the vote on the proposals to be put to the extraordinary general meeting or the redemption threshold. Any such report will include descriptions of any arrangements entered into or significant purchases by any of the aforementioned persons.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder.

Recommendation to Shareholders of SOAC

The SOAC Board believes that the Business Combination Proposal and the other proposals to be presented at the extraordinary general meeting are in the best interest of SOAC and its shareholders and unanimously recommends that its shareholders vote "FOR" the Continuance Proposal, "FOR" the Business Combination Proposal, "FOR" the Charter Proposal, "FOR" the Organizational Documents Proposals, "FOR" the NYSE Proposal, "FOR" the Incentive Award Plan Proposal and "FOR" the Adjournment Proposal, in each case, if presented to the extraordinary general meeting.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

Sources and Uses of Funds for the Business Combination

The following tables summarize the sources and uses for funding the Business Combination assuming a Closing Date of March 31, 2021 and (i) assuming that none of SOAC's outstanding public shares are redeemed in connection with the Business Combination and (ii) assuming that all of SOAC's outstanding public shares are redeemed in connection with the Business Combination.

No Redemption

Source of Funds (in thousands)		Uses (in thousands)	
Existing Cash held in trust account[1]	$ 300,073	TMC Common Shares issued to Existing DeepGreen Securityholders[2]	$ 230,600
TMC Common Shares issued to Existing DeepGreen Securityholders[2]	230,600	Transaction Fees and Expenses[3]	69,968
PIPE Financing	330,300	Remaining Cash on Balance Sheet	560,405
Total Sources	$ 860,973	**Total Uses**	$ 860,973

Maximum Redemption

Source of Funds (in thousands)		Uses (in thousands)	
Existing Cash held in trust account[4]	$ —	TMC Common Shares issued to Existing DeepGreen Securityholders[2]	$ 230,600
TMC Common Shares issued to Existing DeepGreen Securityholders[2]	230,600	Transaction Fees and Expenses[3]	69,968
PIPE Financing	330,300	Remaining Cash on Balance Sheet	260,332
Total Sources	$ 560,900	**Total Uses**	$ 560,900

(1) As of March 31, 2021.
(2) TMC Common Shares issued to Existing DeepGreen Securityholders are at a deemed value of $10.00 per share. Assumes 230,600,000 TMC Common Shares are issued to the Existing DeepGreen Securityholders (assuming the exercise of such options).
(3) Represents the total estimated transaction fees and expenses incurred by SOAC and DeepGreen as part of the Business Combination.
(4) Assumes that all of SOAC's outstanding public shares are redeemed in connection with the Business Combination.

U.S. Federal Income Tax Considerations

For a discussion summarizing the U.S. federal income tax considerations of the Continuance and exercise of redemption rights, please see "*U.S. Federal Income Tax Considerations*."

Expected Accounting Treatment

The Business Combination

The Business Combination will be accounted for as a reverse recapitalization in conformity with GAAP. Under this method of accounting, SOAC is treated as the "acquired" company for financial reporting purposes. This determination was primarily based on the Existing DeepGreen Shareholders comprising a relative majority of the voting power of the combined company, DeepGreen's operations prior to the acquisition comprising the only ongoing operations of TMC, and DeepGreen's senior management comprising a majority of the senior management of TMC. Accordingly, for accounting purposes, the financial statements of the combined entity will represent a continuation of the financial statements of DeepGreen with the Business Combination being treated as the equivalent of DeepGreen issuing shares for the net assets of SOAC, accompanied by a recapitalization. The net assets of SOAC will be stated at historical costs, with no goodwill or other intangible assets recorded.

Emerging Growth Company

SOAC is an "emerging growth company," as defined in Section 2(a) of the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"), and it may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act"), the reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and the exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

Further, Section 102(b)(1) of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies (that is, those that have not had a Securities Act registration statement declared effective or do not have a class of securities registered under the Exchange Act) are required to comply with the new or revised financial accounting standards. The JOBS Act provides that a company can elect to opt out of the extended transition period and comply with the requirements that apply to non-emerging growth companies but any such election to opt out is irrevocable. SOAC has elected not to opt out of such extended transition period, which means that when a standard is issued or revised and it has different application dates for public or private companies, SOAC, as an emerging growth company, can adopt the new or revised standard at the time private companies adopt the new or revised standard. This may make comparison of SOAC's financial statements with certain other public companies difficult or impossible because of the potential differences in accounting standards used.

SOAC will remain an emerging growth company until the earlier of: (i) the last day of the fiscal year (a) following the fifth anniversary of the closing of SOAC's initial public offering, (b) in which SOAC has total annual gross revenue of at least $1.07 billion or (c) in which SOAC is deemed to be a large accelerated filer, which means the market value of SOAC's common equity that is held by non-affiliates exceeds $700 million as of the last business day of its most recently completed second fiscal quarter; and (ii) the date on which SOAC has issued more than $1.00 billion in non-convertible debt securities during the prior three-year period. References herein to "emerging growth company" have the meaning associated with it in the JOBS Act.

Smaller Reporting Company

Additionally, we are a "smaller reporting company" as defined in Item 10(f)(1) of Regulation S-K. Smaller reporting companies may take advantage of certain reduced disclosure obligations, including, among other things, providing only two years of audited financial statements. We will remain a smaller reporting company until the last day of the fiscal year in which (i) the market value of our ordinary shares held by non-affiliates exceeds $250 million as of the prior June 30 or (ii) our annual revenues exceeded $100 million during such completed fiscal year and the market value of our ordinary shares held by non-affiliates exceeds $700 million as of the prior June 30.

Summary of Risk Factors

In evaluating the proposals set forth in this proxy statement/prospectus, a shareholder should carefully read this proxy statement/prospectus, including the Annexes, and especially consider the factors discussed in the section entitled "*Risk Factors*." The occurrence of one or more of the events or circumstances described in the section titled "*Risk Factors*," alone or in combination with other events or circumstances, may materially adversely affect our business, financial condition and operating results. Such risks include, but are not limited to:

Risks Relating to DeepGreen's Business and TMC Following the Business Combination

Some of the risks related to DeepGreen's business and industry are summarized below. References in the summary below to "DeepGreen" generally refer to DeepGreen and its subsidiaries in the present tense, and TMC from and after the Business Combination.

- DeepGreen's key exploration and development activities are undertaken primarily by its subsidiaries NORI and TOML, which are sponsored by Nauru and Tonga, respectively, and which require the continued sponsorship of those countries for such subsidiaries' business operations. If either country ceases such sponsorship, NORI or TOML would need to seek sponsorship elsewhere, which could impact the operations of DeepGreen as a group. Furthermore, changes in government regulation and political instability within these areas could impact DeepGreen's mineral exploration and future prospects in the CCZ.
- DeepGreen's business relies on the ability of NORI and TOML, as applicable, to obtain approval for necessary permits, contracts and licenses to collect polymetallic nodules granted by the International Seabed Authority ("ISA"), among other regulators. The failure to obtain such approvals could disrupt or prohibit DeepGreen's operations.
- DeepGreen's success will depend on its ability to attract skilled operators, maintenance technicians, engineers and other personnel required to operate its business. In the event that DeepGreen is unable to hire, train and retain the necessary number of skilled technicians, engineers and other personnel, there could be an adverse impact on its labor costs and its ability to reach anticipated production levels in a timely manner, which could have a material adverse effect on its results of operations. DeepGreen's exploration, collecting, and processing activities are subject to laws, rules, regulations, environmental requirements, taxation and other policies that are subject to change and that may significantly impact DeepGreen's business, financial condition, liquidity and viability of operations.
- DeepGreen may be subject to potential risks and liabilities associated with pollution of the environment that could occur as a result of exploration, development, production and processing activities. Such liabilities may impact the performance of DeepGreen's business or may require DeepGreen to suspend its operations.
- Seafloor polymetallic nodules have never been commercially mined on a full scale. Mineral resource exploration is highly speculative and characterized by a number of significant risks including suitable equipment and favorable sea and climate conditions. DeepGreen cannot guarantee that minerals will be discovered in sufficient grade or quantities to be commercially viable.
- Until mineral reserves and mineral resources are actually collected and processed, DeepGreen must rely upon estimated calculations for the mineral resources and grades of mineralization in contract areas and estimated equipment production rates and collection efficiency, which might prove to be materially inaccurate and thus have an adverse impact on projections for DeepGreen's future revenues, cash flows, royalties, and development and operating expenditures.
- Any polymetallic nodules that DeepGreen recovers will require specialized treatment and processing on high value equipment, which DeepGreen may not be able to develop or which may not provide the projected metal recovery rates at the estimated project capital and operating costs, which could impact projections for DeepGreen's future revenues, cash flows, royalties, and development and operating expenditures.

- DeepGreen's collecting, development and processing operations involve many hazards and uncertainties which could result in damage to, or destruction of, production facilities, personal injury or death, environmental damage, delays in processing, increased production costs, asset write downs, monetary losses and legal liability, all of which could have an adverse effect on DeepGreen's business.
- DeepGreen has a limited operating history and cannot provide assurance of profitability in the future. DeepGreen's actual operating costs on a commercial scale may differ significantly from those that have been anticipated.
- DeepGreen relies on existing and future strategic relationships in order to successfully identify, collect and process polymetallic nodules. There can be no assurance that DeepGreen will be able to continue to maintain and develop such relationships.
- The profitability of DeepGreen's collecting operations will be significantly affected by changes to the market price, demand and taxation of battery metals and manganese as well as the cost of power, petroleum fuels, and oil.
- DeepGreen may become subject to legal proceedings as well as pressure and lobbying from non-governmental organizations, particularly with respect to environmental concerns, which may cause significant disruption to DeepGreen's business.
- Offshore operations could be interrupted by non-governmental organizations or subject to piracy, which in the absence of strong enforcement by regulators, could negatively impact DeepGreen's ability to operate.
- DeepGreen has identified a material weakness in its internal control over financial reporting which, if not corrected, could affect the reliability of its consolidated financial statements and have other adverse consequences.
- DeepGreen's business is subject to a variety of risks, some of which may not be covered by existing or future insurance policies, which may reduce or eliminate any future profitability and a decline in the value of DeepGreen's securities.
- The COVID-19 pandemic has and could continue to materially impact aspects of DeepGreen's business, including increasing the cost of operations and reducing employee productivity, limiting travel of personnel, adversely affecting the health and welfare of personnel, or preventing or delaying important third party service providers from performing normal and contracted activities crucial to the operation of DeepGreen's business.
- DeepGreen relies on third parties to conduct independent analyses with respect to its business, and any inaccuracies in such analyses could have a material adverse effect on its collecting and development objectives.
- The materials that DeepGreen intends to collect and process are contemplated to be used in large part for batteries for hybrid and electric vehicles. Accordingly, the growth of DeepGreen's business is highly dependent upon the demand for electric vehicles, which may not develop as expected.
- DeepGreen's continuing exploration is capital intensive and may depend on its ability to obtain necessary financing or cause the business to incur debt. There is no assurance that DeepGreen will be successful in obtaining the required financing for its operations or be able to satisfy any resulting debt obligations.
- DeepGreen relies on the willingness of EV and battery metals consumers to acquire metals produced from deep-sea collection operations. Some market proponents have recently expressed opposition to acquiring deep-sea derived metals, and if this position gains broad traction in the marketplace for EV and Battery metals, it could have a material impact on its business and operations.

Risks Relating to the Business Combination and SOAC

- SOAC's shareholders will experience dilution due to the issuance to the seller of securities entitling it to a significant voting stake in TMC.
- A significant portion of SOAC's total outstanding shares are restricted from immediate resale but may be sold into the market in the near future. This could cause the market price of the TMC Common Shares to drop significantly, even if TMC's business is doing well.
- TMC's ability to be successful following the Business Combination will depend upon the efforts of the TMC Board and DeepGreen's key personnel, and the loss of such persons could negatively impact the operations and profitability of TMC's business following the Business Combination.

SELECTED HISTORICAL FINANCIAL INFORMATION OF SOAC

SOAC is providing the following selected historical financial data to assist you in your analysis of the financial aspects of the Business Combination. SOAC's condensed balance sheet data as of December 31, 2020 and 2019 and the statement of operations data for the period ended December 31, 2020 and for the period from December 18, 2019 (inception) through December 31, 2019 are derived from SOAC's audited financial statements included elsewhere in this proxy statement/prospectus. SOAC's financial data as of and for the three months ended March 31, 2021 and 2020 is derived from SOAC's unaudited consolidated financial statements included elsewhere in this proxy statement/prospectus.

This information is only a summary and should be read in conjunction with SOAC's consolidated financial statements and related notes and "*SOAC's Management's Discussion and Analysis of Financial Condition and Results of Operations*" contained elsewhere in this proxy statement/prospectus. SOAC's historical results are not necessarily indicative of future results, and the results for any interim period are not necessarily indicative of the results that may be expected for a full fiscal year.

	Three months ended March 31, 2021	Three months ended March 31, 2020	Year ended December 31, 2020 (restated)	Period from December 18, 2019 (inception) to December 31, 2019
Statement of Operations Data:				
General and administrative expenses	$ 2,984,922	$ 58,999	$ 2,917,254	$ 9,039
General and administrative expenses – related party	30,000	—	80,000	—
Net income (loss)	$ 31,869,620	$ (58,999)	$ (2,928,008)	$ (9,039)
Weighted average shares outstanding of shares subject to possible redemption, basic and diluted	22,762,132	—	28,635,735	—
Basic and diluted net income per share, shares subject to possible redemption	$ 0.00	$ —	$ 0.00	$ —
Weighted average ordinary shares outstanding, basic and diluted[(1)]	14,737,868	7,500,000	9,512,145	8,625,000
Basic and diluted net loss per share, Non-redeemable shares	$ 2.16	$ (0.01)	$ (0.31)	$ (0.00)

	March 31, 2021	December 31, 2020 (restated)	December 31, 2019
Consolidated Balance Sheet Data (At Period End):			
Working capital	$ (3,386,806)	$ (371,917)	$ (87,699)
Total assets	$ 301,443,357	$ 301,578,220	$ 119,621
Total liabilities	$ 37,306,519	$ 69,311,002	$ 103,660
Class A ordinary shares (excluding 25,913,683 and 22,726,721 shares subject to possible redemption at 10.00 per share at March 31, 2021 and December 31, 2020, respectively)	$ 409	$ 727	$ —
Class A ordinary shares (including 25,913,683 and 22,726,721 shares subject to possible redemption at 10.00 per share at March 31, 2021 and December 31, 2020, respectively)	$ 259,136,830	$ 227,267,210	$ —
Class B ordinary shares	$ 750	$ 750	$ 863
Total shareholders' equity (deficit)	$ 5,000,008	$ 5,000,008	$ 15,961

	Three months ended March 31, 2021 (unaudited)	Three months ended March 31, 2020	Year ended December 31, 2020 (restated)	Period from December 18, 2019 (inception) to December 31, 2019
Cash Flow Data:				
Net cash used in operating activities	$ (129,587)	$ —	$ (1,335,631)	$ —
Net cash used in investing activities	—	—	(300,000,000)	—
Net cash provided by financing activities	—	—	302,634,932	—

SELECTED HISTORICAL FINANCIAL INFORMATION OF DEEPGREEN

The following table sets forth summary historical financial information of DeepGreen for the periods and as of the dates indicated. The summary historical financial information of DeepGreen as of and for the years ended December 31, 2020, and 2019 was derived from the audited historical financial statements of DeepGreen included elsewhere in this proxy statement/prospectus. The summary historical interim financial information of DeepGreen as of March 31, 2021, and for the three months ended March 31, 2021 and 2020 was derived from the unaudited consolidated financial statements of DeepGreen included elsewhere in this proxy statement/prospectus and has been prepared on a consistent basis as the audited consolidated financial statements. In the opinion of DeepGreen's management, the interim financial statements reflect all adjustments, consisting only of normal recurring adjustments, necessary for the fair statement of the financial information in those statements.

The following summary historical financial information should be read together with DeepGreen's financial statements and accompanying notes and "*Management's Discussion and Analysis of Financial Condition and Results of Operations of DeepGreen*" appearing elsewhere in this proxy statement/prospectus. The summary historical financial information in this section is not intended to replace DeepGreen's financial statements and the related notes thereto. DeepGreen's historical results are not necessarily indicative of the results that may be expected in the future.

	Three Months Ended March 31		Year Ended December 31	
	2021	2020	2020	2019
Statement of Operations Data:				
Exploration expenses	$ 39,364,151	$ 12,181,916	$ 48,881,445	$ 38,830,228
General and administrative expenses	$ 17,955,010	$ 874,817	$ 7,722,922	$ 4,468,495
Other items	$ 239,058	$ (76,396)	$ 27,012	$ (226,352)
Net loss	$ (57,558,219)	$ (12,980,337)	$ (56,631,379)	$ (43,072,371)
Weighted average Common Shares outstanding, basic and diluted	166,149,715	141,193,613	154,224,664	131,308,417
Basic and diluted net loss per share	$ (0.35)	$ (0.09)	$ (0.37)	$ (0.33)

	As of March 31, 2021	As of December 31, 2020	As of December 31, 2019
Condensed Balance Sheet Data (At Period End):			
Working capital	$ 17,665,750	$ 2,469,500	$ 14,220,506
Total assets	$ 69,706,871	$ 54,684,973	$ 18,323,461
Total liabilities	$ 44,075,169	$ 18,430,843	$ 10,135,849
Common shares	$ 183,137,353	$ 154,431,291	$ 79,824,445
Preferred shares	$ 550,000	$ 550,000	$ 550,000
Additional paid in capital	$ 63,576,426	$ 45,346,696	$ 35,255,520
Accumulated other comprehensive loss	$ (1,215,660)	$ (1,215,659)	$ (1,215,534)
Total shareholders' equity (deficit)	$ (220,416,417)	$ (162,858,198)	$ (106,226,819)

	Three Months Ended March 31		Year Ended December 31	
	2021	2020	2020	2019
Cash Flow Data:				
Net cash used in operating activities	$ (10,060,037)	$ (2,928,553)	$ (26,531,576)	$ (15,078,141)
Net cash used in investing activities	$ (2,190,000)	$ (250,000)	$ (607,375)	$ (2,123,475)
Net cash provided by financing activities	$ 27,377,272	$ 1,166,818	$ 21,292,653	$ 26,506,425

SUMMARY UNAUDITED PRO FORMA COMBINED FINANCIAL INFORMATION

The following summary unaudited pro forma combined financial information has been derived from the unaudited pro forma condensed combined balance sheet as of March 31, 2021 and the unaudited pro forma condensed combined statements of operations for the three months ended March 31, 2021 and for the year ended December 31, 2020 included in "*Unaudited Pro Forma Combined Financial Information*." The following summary unaudited pro forma condensed combined financial information for the three months ended March 31, 2021 and for the year ended December 31, 2020 combines the historical statement of operations of SOAC and the historical consolidated statement of operations of DeepGreen, giving effect to the Business Combination as if it had occurred on January 1, 2020. The summary unaudited pro forma condensed combined balance sheet as of March 31, 2021 combines the historical balance sheet of SOAC and DeepGreen, giving effect to the Business Combination as if it had occurred on March 31, 2021.

The summary unaudited pro forma combined financial information should be read in conjunction with the unaudited pro forma condensed combined balance sheet and the unaudited pro forma condensed combined statement of operations, and the accompanying notes. In addition, the unaudited condensed combined pro forma financial information was based on and should be read in conjunction with the historical financial statements of SOAC and DeepGreen, including the accompanying notes, which are included elsewhere in this proxy statement/prospectus.

The Business Combination will be accounted for as a reverse capitalization, with no goodwill or other intangible assets recorded, in accordance with GAAP. Under this method of accounting, SOAC is treated as the "acquired" company for financial reporting purposes. Accordingly, for accounting purposes, the financial statements of the combined entity will represent a continuation of the financial statements of DeepGreen with the Business Combination being treated as the equivalent of DeepGreen issuing shares for the net assets of SOAC, accompanied by a recapitalization. The net assets of SOAC are stated at historical cost, with no goodwill or other intangible assets recorded. Operations prior to the Business Combination are those of DeepGreen.

The unaudited pro forma combined financial information has been prepared assuming two alternative levels of redemption into cash of SOAC's ordinary shares:

- ***Assuming No Redemptions***: This presentation assumes that no SOAC shareholders exercise redemption rights with respect to their public shares; and
- ***Assuming Maximum Redemptions***: This presentation assumes that all of SOAC's public shareholders exercise redemption rights with respect to their Class A ordinary shares. This scenario assumes that 30,000,000 Class A ordinary shares are redeemed for an aggregate redemption payment of approximately $300.1 million. This maximum redemption scenario is based on the maximum number of redemptions which may occur but which would still provide the minimum aggregate Business Combination and PIPE Financing proceeds of $250 million, consisting of SOAC trust account funds and PIPE Financing proceeds less SOAC's unpaid expenses, to be delivered at the Closing of the Business Combination and the PIPE Financing.

	Pro Forma Combined (Assuming No Redemption)	Pro Forma Combined (Assuming Maximum Redemption)	Pro Forma Combined (Assuming No Redemption)	Pro Forma Combined (Assuming Maximum Redemption)
	For the three months ended March 31, 2021		For the year ended December 31, 2020	
Summary Unaudited Pro Forma Condensed Combined Statement of Operations Data				
Loss for the year	$ 46,887,739	$ 46,887,738	$ 81,208,861	$ 81,208,861
Net loss – basic and diluted	0.16	0.17	0.27	0.30
Weighted-average shares outstanding – basic and diluted	300,348,305	270,348,305	300,348,305	270,348,305

	Pro Forma Combined (Assuming No Redemption)	Pro Forma Combined (Assuming Maximum Redemption)
	As of March 31, 2021	
Summary Unaudited Pro Forma Condensed Combined Balance Sheet Data		
Total assets	$ 629,751,269	$ 329,677,625
Total liabilities	$ 39,842,466	$ 39,842,466
Total deficit	$ (228,597,647)	$ (228,597,647)

COMPARATIVE PER SHARE DATA

The following table sets forth:

- historical per share information of SOAC for the three months ended March 31, 2021 and for the year ended December 31, 2020;
- historical per share information of DeepGreen for the three months ended March 31, 2021 and for the year ended December 31, 2020; and
- unaudited pro forma per share information of the combined company for the three months ended March 31, 2021 and for the year ended December 31, 2020 after giving effect to the Business Combination and PIPE Financing, assuming two redemption scenarios as follows:
  - ***Assuming No Redemptions*:** This presentation assumes that no SOAC shareholders exercise redemption rights with respect to their public shares.
  - ***Assuming Maximum Redemptions:*** This presentation assumes that all of SOAC's public shareholders exercise redemption rights with respect to their Class A ordinary shares. This scenario assumes that 30,000,000 Class A ordinary shares are redeemed for an aggregate redemption payment of approximately $300.1 million. This maximum redemption scenario is based on the maximum number of redemptions which may occur but which would still provide the minimum aggregate Business Combination and PIPE Financing proceeds of $250.0 million, consisting of SOAC trust account funds and PIPE Financing proceeds less SOAC's unpaid expenses, to be delivered at the Closing of the Business Combination and the PIPE Financing.

The following table is also based on the assumption that 33,030,000 TMC Common Shares are issued to the PIPE Investors upon the consummation of the PIPE Financing. If the actual facts are different than these assumptions, the below numbers will be different. These numbers also do not take into account the Allseas Warrant exercisable for TMC Common Shares upon the consummation of the Business Combination and public and private warrants to purchase TMC Common Shares that will be outstanding immediately following the completion of the Business Combination.

The historical information should be read in conjunction with *"Selected Historical Financial Information of DeepGreen," "Selected Historical Financial Information of SOAC," "DeepGreen's Management's Discussion and Analysis of Financial Condition and Results of Operations"* and *"SOAC's Management's Discussion and Analysis of Financial Condition and Results of Operations"* contained elsewhere in this proxy statement/prospectus and the audited consolidated financial statements and the related notes of DeepGreen and SOAC contained elsewhere in this proxy statement/prospectus.

The unaudited pro forma per share information is derived from, and should be read in conjunction with, the unaudited pro forma condensed combined financial information and related notes included elsewhere in this proxy statement/prospectus. The unaudited pro forma combined net loss per share information below does not purport to represent what the actual results of operations of TMC would have been had the Business Combination been completed or to project TMC results of operations that may be achieved after the Business Combination. The unaudited pro forma book value per share information below does not purport to represent what the book value of TMC would have been had the Business Combination been completed nor the book value per share for any future date or period.

In connection with the closing of the Business Combination, a total of 136.2 million TMC Special Shares are expected to be outstanding and will be convertible into TMC Common Shares if certain TMC Common Share price thresholds are exceeded following the closing of the Business Combination. Because these underlying TMC Common Shares are contingently issuable based upon the price of the TMC Common Shares reaching specified thresholds that are not currently met, these contingent shares have been excluded from basic loss per share. The TMC Special Shares should be considered for diluted loss per share, however, these securities would be anti-dilutive given the historical pro forma net loss and have therefore, been excluded from diluted pro forma loss per share.

As part of the normal course of business, DeepGreen issued a warrant to Allseas that shall be exercisable into a variable number of TMC Common Shares, contingent upon the successful completion of the PMTS (as defined below). The amount of TMC Common Shares to be issued upon exercise of the Allseas Warrant will vary depending on the date of successful completion of the PMTS. The Allseas Warrant has an exercise price of $0.01 per Common Share and is not considered dilutive until the successful completion of the PMTS.

As a result, pro forma diluted loss per share is the same as pro forma basic loss per share for the periods presented.

			Combined Pro Forma		DeepGreen Metals Pro forma per share data[2]	
	SOAC (Historical)	DeepGreen Metals (Historical)	Assuming No Redemption	Assuming Maximum Redemption	Assuming No Redemption	Assuming Maximum Redemption
As of and for the three months ended March 31, 2021 *(Unaudited)*						
Book value per share[1][2]	$ (2.85)	$ 0.15	$ 1.96	$ 1.07	$ 2.29	$ 1.25
Weighted average common shares outstanding – basic and diluted	$ 12,591,295	$ 166,149,715	N/A	N/A	230,559,305	230,559,305
Weighted average shares of TMC Class A common stock outstanding – basic and diluted	N/A	N/A	300,348,305	270,348,305	N/A	N/A
Net (income) loss per share – common shares – basic and diluted	$ (2.53)	$ 0.35	N/A	N/A	$ 0.18	$ 0.20
Net loss per share, TMC Class A – basic and diluted	N/A	N/A	$ 0.16	$ 0.17	N/A	N/A
As of and for the year ended December 31, 2020						
Book value per share[1]	$ 0.48	$ 0.24	$ 1.88	$ 0.98	$ 2.19	$ 1.14
Weighted average common shares outstanding – basic and diluted	10,464,651	154,224,664	N/A	N/A	230,559,305	230,559,305
Weighted average shares of TMC Class A common stock outstanding – basic and diluted	N/A	N/A	300,348,305	270,348,305	N/A	N/A
Net loss per share – common shares – basic and diluted	$ 3.50	$ 0.37	N/A	N/A	$ 0.32	$ 0.35
Net loss per share, TMC Class A – basic and diluted	$ N/A	$ N/A	$ 0.27	$ 0.30	N/A	N/A

(1) Book value per share is calculated as Total Equity divided by pro forma outstanding shares

(2) The equivalent pro forma basic and diluted per share data for DeepGreen is calculated by multiplying the combined pro forma per share data by the exchange ratio of approximately 1.16. The weighted average shares outstanding includes DeepGreen Common Shares and DeepGreen Preferred Shares, which will convert to TMC Common Shares and stock options of DeepGreen, which will be exchanged for TMC stock options at the same ratio.

RISK FACTORS

SOAC shareholders should carefully consider the following risk factors, together with all of the other information included in this proxy statement/prospectus, before they decide whether to vote or instruct their vote to be cast to approve the relevant proposals described in this proxy statement/prospectus. These risk factors are not exhaustive and investors are encouraged to perform their own investigation with respect to our business, financial condition and prospects.

Risks related to DeepGreen's Business and to TMC Following the Business Combination

We have identified the following risks and uncertainties that may have a material adverse effect on our business, financial condition, results of operations or reputation. The risks described below are not the only risks we face. Additional risks not presently known to us or that we currently believe are not material may also significantly affect our business, financial condition, results of operations or reputation. Our business could be harmed by any of these risks. In assessing these risks, you should also refer to the other information contained in this proxy statement/prospectus, including our consolidated financial statements and related notes. Unless the context otherwise requires, all references in these Risk Factors to the "Company," "we," "us" or "our" refer to the business of DeepGreen and its subsidiaries prior to the consummation of the Business Combination, which will be the business of TMC following the consummation of the Business Combination. Accordingly, the risks described below relating to DeepGreen could also materially and adversely affect the combined company after the consummation of the Business Combination.

Risks related to Laws, Rules, Regulations and Policies

Our business is subject to numerous regulatory uncertainties which, if not resolved in our favor, would have a material adverse impact on our business.

To date, no collection (also referred to as "mining," "exploitation" or "harvesting") of nodules has occurred in the area of the high seas beyond national jurisdiction (the "Area"), which includes the CCZ. Moreover, despite the release by the International Seabed Authority (the "ISA") of the Draft Regulations on Exploitation of Mineral Resources (the "Draft Regulations"), finalization of such regulations remains subject to approval and adoption by the ISA. The ISA indicated an intention to finalize the Draft Regulations by July 2020, but the July session was deferred as a result of the COVID-19 pandemic. We expect that the final regulations ("Final Regulations") could be approved within the next two years, but there can be no assurance that such regulations will be approved then, or at all, which would have a material adverse effect on the ability of our subsidiaries to undertake collecting as currently contemplated. The Draft Regulations and several supporting standards and guidelines are at an advanced stage, but there remains uncertainty regarding the final form that these will take, as well as the impact that such regulations, standards and guidelines will have on our ability to meet our objectives.

The collection of polymetallic nodules within the CCZ, where our exploration areas are located, will require approval of an Exploitation Contract (which will authorize collection activities), and which will also include approvals with respect to a required environmental and social impact assessment ("ESIA") and the resulting proposed Environmental Management and Monitoring Plan. In order to collect the mineral resources and commercialize our projects, our wholly-owned subsidiaries Nauru Ocean Resources Inc. ("NORI") and Tonga Offshore Mining Limited ("TOML") will each need to obtain an Exploitation Contract, as will our partner Marawa Research and Exploration Limited ("Marawa"), in addition to related permits that may be required by our commercial partners. There can be no assurance that all necessary permits, contracts and licenses will be obtained that may be required to carry out exploration, development, collecting and processing operations. There is a risk that an Exploitation Contract may not be granted by the ISA, or may not be granted on a timely basis, or may be granted on uneconomic terms.

Similarly, with respect to Sponsor State regulation, no assurance can be given that new rules and regulations will not be enacted or that existing rules and regulations will not be applied in a manner that would limit or curtail production or development by our subsidiaries. Amendments to current laws and regulations governing the operations and activities of deep sea mineral resources companies, or changes in interpretation thereto, or the unwillingness of countries throughout the world to enforce such laws and regulations, could have a material adverse impact on our business, and could cause increases in exploration expenses, capital expenditures, production costs, or

put the security of our equipment at risk to social advocacy or piracy. Such amendments could also cause reductions in our future production, or the delay or abandonment in the development of our polymetallic mineral resource properties. There can be no certainty that actions by governmental and regulatory authorities, including changes in regulation, taxation and other fiscal regimes, will not adversely impact our projects or our business. Further, DeepGreen's operations depend on the continuation of the sponsorship arrangements between our subsidiaries TOML and NORI and each of their host sponsoring nations, the Kingdom of Tonga and the Republic of Nauru, respectively. Each subsidiary has been registered and incorporated within such host nation and each nation has maintained effective supervision, regulation, and sponsorship over the conduct of such subsidiary. While DeepGreen has beneficial ownership over such subsidiaries, we operate under the regulation and sponsorship of the Republic of Nauru and the Kingdom of Tonga. If such arrangement is challenged, or sponsorship is terminated, DeepGreen may have to restructure the ownership or operations of such subsidiary to ensure continued state sponsorship. Failure to maintain sponsorship, or secure new state sponsorship, will have a material impact on such subsidiary and on our overall business and operations.

While the rates of payments are yet to be set by the ISA, the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (the "1994 Implementation Agreement") prescribes a relevant framework that the rates of payments "shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage." The ISA has held workshops with stakeholders to discuss and seek comments on the potential financial regime for the collecting of polymetallic nodules in the Area. There can be no assurance that the ISA will put in place Final Regulations in a timely manner or at all. Such regulations may also impose burdensome obligations or restrictions on us, and/or may contain terms that do not enable us to develop our projects.

Our resource activities are subject to changes in government regulation and political instability.

Parties carrying out exploration and collection operations in the Area must be sponsored by a State that is a member of the ISA. The sponsoring States of our subsidiaries NORI and TOML are Nauru and Tonga, respectively. If either country ceases such sponsorship, NORI or TOML would need to seek sponsorship elsewhere, which could impact the operations of DeepGreen (or TMC following the consummation of the Business Combination) as a group.

In addition, our subsidiary, DeepGreen Engineering Pte Ltd. ("DGE"), has an exclusive contract with Marawa, which is sponsored by the Republic of Kiribati that permits DGE to conduct activities in connection with the exploration contract held by Marawa with the ISA. There is a risk that a State sponsoring activities in a project area ceases to be a sponsor, or is not permitted to be a sponsor, or our subsidiary ceases to remain as a sponsored contractor by such State; and if an agreement cannot be reached with a substitute sponsoring State, or if we are unable to transfer our sponsorship to another State, such subsidiary could be forced to cease activities in the Area.

Additionally, there is little jurisprudence or interpretative guidance regarding the application of the sponsorship regulations that are applicable to our business. For example, with respect to the question over the regulation of which State can impact the activities of any contractor (such as NORI or TOML), we have taken the view that incorporation, registration and the grant of nationality are critical factors, amongst others, notwithstanding the beneficial ownership of a subsidiary by its parent ("beneficial ownership"). While this position has not been challenged by our sponsoring States or the ISA, certain organizations that oppose the deep sea polymetallic exploration and collecting industry have advocated for the use of a beneficial ownership test for state sponsorship, and there are no guarantees that our interpretation will be universally accepted in the future.

The mineral exploration activities of our subsidiaries and their future project development prospects could be affected in varying degrees by political instability and changes in government regulation relating to foreign investment and the deep sea polymetallic collecting business, including expropriation. Operations may also be affected in varying degrees by possible terrorism, military conflict, crime, piracy, fluctuations in currency rates, and high inflation. In addition, from time to time, governments may nationalize private businesses, including companies such as ours. There can be no assurance that the governments of countries where we or our affiliates or third-party contractors operate or the governments with which our subsidiaries work in the Area will not nationalize companies such as ours and our assets in the future, or impose burdensome obligations or restrictions. There can also be no assurance that the ISA will not impose burdensome obligations or restrictions on our business or our projects (or those of our affiliates and third-party contractors), or that they will not implement policies or regulations that would prevent us from accomplishing our objectives.

Changes to any of the laws, rules, regulations or policies to which we are subject could have a significant impact on our business.

Changes to any of the laws, rules, regulations, taxation or other policies to which we are subject could have a significant impact on our business. There can be no assurance that we will be able to comply with any future laws, rules, regulations and policies. Failure to comply with applicable laws, rules, regulations, and policies may subject us to civil or regulatory proceedings, including fines or injunctions, which may have a material adverse effect on our business, financial condition, liquidity, and results of operations. In addition, compliance with any future laws, rules, regulations, and policies could negatively impact our profitability, and could have a material adverse effect on our business, financial condition, liquidity and results of operations.

Furthermore, the Company may seek to expand its production capabilities in the future, which would require additional regulatory approvals that may not be provided in a timely manner or at all. Furthermore, such additional approvals could require changes to environmental offset areas and related environmental protections which, if overly burdensome, could impact our operations.

Our exploration, collecting, and processing activities are subject to extensive and costly environmental requirements, and current and future laws, regulations, and permits may impose significant costs, liabilities, or obligations, or could limit or prevent our ability to continue our operations as currently contemplated or to undertake new operations.

All phases of exploring for and collecting and processing polymetallic nodules will be subject to environmental regulation in various jurisdictions and under national as well as international laws and conventions. No seafloor polymetallic nodule deposit has been harvested on a commercial scale, and it is not clear what environmental parameters may need to be measured to satisfy regulatory authorities that an Exploitation Contract should be granted. A full ESIA for deep sea collecting operations has yet to be completed and approved by the ISA, and the full impact of any polymetallic nodule collecting operation on the environment has yet to be determined. Further, the required standards for an ESIA are currently unclear and have not been finalized by the ISA, which could require changes to any submissions made by our subsidiaries in connection with an Exploitation Contract application. Environmental legislation is evolving in a manner which is likely to require stricter standards and enforcement, increased fines and penalties for non-compliance, more stringent environmental assessments of proposed projects and a heightened degree of responsibility for companies and their officers, directors and employees. Additionally, while we intend to produce seafloor polymetallic nodules in a way that mitigates and reduces potential damage to the seafloor and marine environmental conditions, we do not know whether the ISA or any other regulatory body will seek to impose impracticable restoration or rehabilitation obligations on our collecting process. Any such obligations, to the extent they are overly burdensome, could result in material changes to our business as currently contemplated.

Although the environmental impact review process has not yet been finalized, all contractors have been made aware of the requirement to complete baseline studies and an ESIA, culminating in an Environmental Impact Statement ("EIS"), prior to collecting. The EIS would be accompanied by an Environmental Management and Monitoring Plan ("EMMP"), which will be required as part of the application for an Exploitation Contract within the Contract Area. The EMMP is expected to specify the objectives and purpose of all monitoring requirements, the components to be monitored, frequency of monitoring, methods of monitoring, analysis required in each monitoring component, monitoring data management and reporting. The EMMP will also be submitted to the ISA for approval as part of the Exploitation Contract application. There are no guarantees that the ISA will evaluate any exploration contract application by our subsidiaries in a timely manner, and even if the ISA does timely evaluate such applications(s), such subsidiary may be required to submit a supplementary EIS before being approved. This may result in delays that could impact our projected timeframe. Furthermore, in the event that the ISA timely evaluates and approves an application, any aspect of such application and approval theoretically could be subject to legal challenges which could result in further delays that could detrimentally impact our business. For example, certain conservation groups have sought to impose a ten-year moratorium on deep-sea polymetallic nodule collection. While this agenda does not appear to have directly impacted the current proposed Final Regulations and implementation of the policies of the ISA, any such moratorium would have a material adverse effect on our business.

The environmental permitting process is expected to involve a series of checks and balances with reviews being conducted by the ISA, including technical evaluations by the ISA secretariat and a constituent body of the ISA known as the Legal and Technical Commission (the "LTC"). The recommendations of the LTC will then go before the ISA Council (a core policy-making body of the ISA), which will then review and, if it deems appropriate, approve the contractor's application. It would require a two-thirds majority of the Council to reject a development proposal that is recommended to it by the LTC. There are no assurances that the work our subsidiaries have done to date or their contemplated future operations will satisfy the final environmental rules and regulations adopted by the ISA, and any future changes could delay the timing of such submissions to the ISA or our subsidiaries operations more generally, which could have a material adverse effect on our business. Sponsoring State approvals and permits are currently and may in future be required in connection with our operations. To the extent such approvals are required and not obtained, our subsidiaries may be curtailed or prohibited from proceeding with planned exploration or development of mineral properties. Failure to comply with applicable laws, regulations, and permitting requirements may result in enforcement actions thereunder, including orders issued by regulatory or judicial authorities causing operations to cease or be curtailed and may include corrective measures requiring capital expenditures, installation of additional equipment, or remedial actions. Parties engaged in collection operations may be required to compensate those suffering loss or damage by reason of the collection activities and may have civil or criminal fines or penalties imposed for violations of applicable laws and regulations.

We may become subject to environmental liabilities as a result of noncompliance or newly imposed regulations.

All of the exploration and development operations of our subsidiaries will be subject to environmental permitting and regulations, which can make operations expensive or prohibit them altogether. We may also be subject to potential risks and liabilities associated with pollution of the environment that could occur as a result of our subsidiaries' exploration, development, production and processing activities.

To the extent that a subsidiary becomes subject to environmental liabilities, the payment of such liabilities, or the costs incurred to remedy environmental pollution, would reduce funds otherwise available to us, which could have a material adverse effect on our business. If we or our subsidiaries are unable to fully remedy an environmental problem, they might be required to suspend operations or enter into interim compliance measures pending completion of the required remedy. The potential exposure could be material to our business.

All of our exploration, development, production and processing activities will be subject to regulation under certain environmental laws and regulations. Our subsidiaries may be required to obtain permits for their activities. They may be required to update and review permits from time to time, and may also be subject to environmental impact analyses and public review processes prior to the approval of any future activities. It is possible that future changes in applicable laws, regulations and permits, or changes in their enforcement or regulatory interpretation by local governments, sponsor States, and other regulatory bodies, could have a significant impact on our business.

Risks related to Exploration, Collecting, Processing, and Commercialization

DeepGreen's business is subject to significant risks, and we may never develop minerals in sufficient grade or quantities to justify commercial operations.

Mineral resource exploration, development, and operations are highly speculative and are characterized by a number of significant risks, including, among other things, unprofitable efforts resulting not only from the failure to discover mineral resources, and from finding mineral resources which, though present, are insufficient in quantity and quality to return a profit from production. Once mineralization is discovered, it may take a number of years from the initial exploration phases before production is possible, during which time the potential feasibility of the project may change adversely. Substantial expenditures are required to establish mineral resources and reserves, to determine processes to collect and transport the minerals and, if required, to construct processing facilities.

No deep sea polymetallic properties in the Area that have been identified have as of today been developed into production. Exploration risk exists in the discovery, location, recovery and definition of seafloor polymetallic nodule deposits. Many companies fail to ever locate an economic deposit, and given that no seafloor polymetallic nodule deposit has ever been commercially developed, such risks may have a material impact on our ability to accomplish

our objectives. Operations may be affected by the availability of suitable vessels and equipment, prevailing sea conditions, changes in meteorological conditions and climate change, currents close to the seafloor and throughout the water column, recovery of materials sampled, lack of experience in delineating deposits, or unsuitability of equipment for recovering such material in prevailing conditions. Substantial expenditures are required to establish mineral reserves, to develop metallurgical processes, and to construct collection and transportation vessels, and we will be required to rely upon the expertise of consultants and others for exploration, development, construction and operational knowhow, and such consultants and third parties may not always be available to support our operations. If we are not able to obtain such expertise or identify alternative sources of expertise, our operations and financial results will be negatively impacted.

While we believe that seafloor polymetallic nodules in the contract areas of our subsidiaries account for some of the world's largest aggregated estimated deposits of battery metals, no assurance can be given that minerals will be discovered in sufficient grade or quantities to justify commercial operations. Whether an exploration property will be commercially viable depends on a number of factors, including: the particular attributes of the deposit, such as size, grade and proximity to infrastructure; metal prices, which are highly cyclical; availability of and effectiveness of technology to recover, trans-ship, transport and process nodules; government regulations, including regulations relating to prices, taxes, royalties, land tenure, land use, and environmental protection; availability of required personnel, third party partners and contractors, any required financing and commercial demand in the marketplace for such metals. The precise impact of these factors cannot accurately be predicted, but the combination of these factors may result in the inability of our subsidiaries to operate or generate an adequate return on invested capital.

While we and our subsidiaries will evaluate the political and economic factors in determining an exploration strategy, there can be no assurance that significant restrictions will not be placed on intended development areas. Such restrictions may have a material adverse effect on our business and results of operation.

No seafloor polymetallic nodule deposit has ever been commercially developed, and our collection and development plans and processes may not be sufficient to accomplish our objectives.

Seafloor polymetallic nodules have never been commercially mined, and there is a risk that our collection and recovery methods and the equipment that we intend to utilize during this process may not be adequate for the economic development of seafloor polymetallic nodule deposits. The equipment and technology that we intend to utilize has not been fully proven in such sub-sea conditions and for this specific material and application, and failure to adapt existing equipment or to develop suitable equipment or recovery and development techniques for the prevailing material and seafloor conditions would have a material adverse effect on the business of our subsidiaries, and the results of their operations and financial condition. We have partnered with Allseas, a leading global offshore contractor, to undertake a pre-production pilot collector test in which a collector vehicle, a riser and lift system and other systems will be tested. Although we expect the pilot collector test to be successful, there can be no assurance that it will be, or that their technology will eventually be adequate for full scale commercial production, or that our intention to partner with Allseas in the initial production activities in one or more of our contract areas will be agreed with Allseas, hence we may be delayed in obtaining offshore collection equipment in the event we do not reach agreement with Allseas and have to develop such equipment on our own or through new third party contractual relationships.

Mineral resource calculations from the contract areas of NORI and TOML are only estimates.

Calculations of mineral resources from the contract areas of NORI and TOML described in this proxy statement/prospectus and reported in Technical Reports prepared by AMC are only estimates and depend on geological interpretation and statistical inferences or assumptions drawn from recovery and sampling analysis, which might prove to be materially inaccurate. While these reports have been provided by experts, there is a degree of uncertainty attributable to the calculation of mineral resources. Mineral Reserves have not been defined and will require completion of further studies. Until mineral resources are actually collected and processed, the quantity of metal and nodule abundance must be considered as estimates only and no assurance can be given that the indicated levels of metals will be produced. In making determinations about whether to advance any of our projects to further development, we must rely upon calculated estimates for the mineral resources and grades of mineralization in our contract areas and estimated equipment production rates and collection efficiency.

The estimation of mineral reserves and mineral resources is a subjective process that is partially dependent upon the judgment of the persons preparing the estimates. The process relies on the quantity and quality of available data and is based on knowledge, experience, statistical analysis of data and industry practices. Valid estimates made at a given time may significantly change when new information becomes available.

Estimated mineral reserves and mineral resources may have to be recalculated based on changes in metal prices, further exploration or development activity or actual production experience. This could materially and adversely affect estimates of the volume or grade of mineralization, estimated recovery rates or other important factors that influence mineral reserves and mineral resources estimates. The extent to which mineral resources may ultimately be reclassified as mineral reserves is dependent upon the demonstration of their profitable recovery. Any material changes in volume and grades of mineralization will affect the economic viability of placing a property into production and a property's return on capital. We cannot provide assurance that polymetallic nodules can be collected or processed profitably.

The mineral resource estimates in this proxy statement/prospectus have been determined and valued based on assumed future metal prices, cut-off grades, production rates and operating costs that may prove to be inaccurate. Extended declines in the market price for nickel, manganese, copper and cobalt may render portions of our mineralization uneconomic and result in reduced reported volume and grades, which in turn could have a material adverse effect on our financial performance, financial position and results of operations.

In addition, inferred mineral resources have a great amount of uncertainty as to their existence and their economic and legal feasibility. You should not assume that any part of an inferred mineral resource will be upgraded to a higher category or that any of the mineral resources will be reclassified as mineral reserves.

The grade and quality of the polymetallic nodule deposits that we intend to develop are estimates, and there are no guarantees that such deposits will be suitable for collecting or commercialization.

The grades of the seafloor polymetallic nodule deposits that we intend to develop and commercialize are estimates that may prove to be inaccurate. While limited samples have been collected and analyzed, there are no guarantees that our projections of quality will hold true with respect to the polymetallic nodule deposits that we are able to collect from the seafloor. Actual grades may vary from our estimates, which could have a material adverse impact on our projections for future revenues, cash flows, royalties, and development and operating expenditures.

In addition, the precise form of mineral occurrence, grade, and tonnage, which is projected based on the mapping and analysis of samples, are not yet known. There is a risk that the sampling and imaging that has been completed to date, and that which will need to be completed in the future, has not and/or will not allow us to accurately quantify the tonnage and grade of identified polymetallic nodule deposits. Moreover, the projections or classifications based on such sampling could result in inaccurate environmental, geological or metallurgical assumptions (including with respect to the size, grade and/or recoverability of minerals) or incorrect assumptions concerning economic recoverability.

Uncertainty in our estimates of polymetallic nodule deposits could result in lower than expected revenues and higher costs.

We base our estimates of polymetallic nodule deposits on engineering, economic, and geological data assembled and analyzed by outside firms, which are reviewed by third party expert consultants including engineers and geologists. Such estimates, however, are necessarily imprecise and depend to some extent on professional interpretation, including statistical inferences drawn from available data, which may prove unreliable. There are numerous uncertainties inherent in estimating quantities and qualities of the polymetallic nodules that we intend to collect and the costs associated therewith, including many factors beyond our control. Estimates of economically recoverable minerals necessarily depend upon a number of variable factors and assumptions, all of which may vary considerably from actual results, such as:

- environmental, geological, geotechnical, collecting and processing conditions that may not be fully identified by available data or that may differ from experience;
- changes to the strategic approach to collecting and processing, which will depend in large part on market demand, corporate strategy and other prevailing economic and financial conditions;

- assumptions concerning future prices of products (including, most notably, battery metals) foreign exchange rates, production rates, process recovery rates, transportation costs, operating costs, capital costs and reclamation costs; and
- assumptions concerning future effects of regulation, including the issuance of required permits and taxes by governmental agencies and foreign government policies relating to our collecting of the mineral resources from our contract areas.

Uncertainty in estimates related to the availability of polymetallic nodules could result in lower than expected revenues and higher than expected costs or a shortened estimated life for our projects. Fluctuations in factors out of our control such as changes in future product pricing, foreign government policies and foreign exchange rates can have a significant impact on the estimates of mineral resources and reserves and can result in significant changes in the quantum of our resources and/or reserves period-to-period.

Our exploration and polymetallic nodule collecting activities may be affected by natural hazards, which could have a material adverse effect on our business.

Deep sea mineral exploration and collection activities are inherently difficult and dangerous and may be delayed or suspended by severe weather events and climate change, sea conditions or other natural hazards, including storms, hurricanes and unpredictable weather patterns. In addition, even though sea conditions in a particular location may be somewhat predictable, the possibility exists that unexpected conditions may occur that adversely affect our operations. Seafloor mineral collection activities may be subject to interruptions resulting from weather and related marine conditions that adversely affect our collection operations or the ports of delivery and any such delays could have a material adverse effect on our business.

The polymetallic nodules that we may recover will require specialized treatment and processing, and there is no certainty that such processes will result in a recovery of metals that is consistent with our expectations, or that we will be able to develop or otherwise access processing plants that are suitable for our purposes.

The polymetallic nodules that our subsidiaries may recover will comprise a mixture of base metals in varying proportions, which will likely necessitate specialized treatment by mineral processing plants or smelters. To date, no polymetallic nodule deposits have been collected and treated for recovery of metal products on a commercial scale, and there is a risk that such treatment may not be economically viable and/or that the nodules being treated will contain elements or compounds that would render them unsuitable for treatment.

To date, no commercial-scale plants have been built to process polymetallic nodules. While Hatch Ltd. ("Hatch"), a global engineering, project management, and professional services firm, has helped us to develop a processing flowsheet with zero solid waste and is working with us in the development of a pilot plant processing program, the actual percentage recovery of metals may vary significantly from that forecast, and we are in the process of conducting a pilot scale metallurgical test-work program to determine our ability to expand such program into a full operational system.

Should our nodule collection plans become successful, we intend to develop land-based processing plants or partner with existing land-based processing partners. Furthermore, our future needs with respect to such processing plants have yet to be fully determined, and as such, the capital costs, performance, reliability, and maintenance of such plants is currently uncertain. While we believe that we have identified specific sites for the potential construction of such plants (based on factors such as proximity to deep-water ports, cost and source of electric power and natural gas, and proximity to customers), there is a risk that we will be unable to secure one or more of these sites on suitable terms. In the event that we are unable to secure one or more of the sites we have identified, or if construction delays impact our ability to develop one or more of such sites, our ability to process polymetallic nodules would be detrimentally impacted. Additionally, there can be no guarantees that such plants can be developed, or if developed, that such plants will perform in an economically viable manner or provide the projected metal recovery rates at the estimated project capital and operating costs, which could impact projections for DeepGreen's future revenues, cash flows, royalties, and development and operating expenditures.

We have identified potential tolling facilities to process nodules to Cu-Ni-Co alloy and Mn silicate, and developed a marketing strategy to place these products into existing smelting and refining facilities. There is no guarantee that these facilities will be available at the required times or that we would be able to secure them at

commercially attractive rates. Additionally, even if we are able to secure appropriate processing facilities (either through ground-up construction or tolling arrangements), there is no guarantee that we will be able to provide them with the required nodule feedstocks at the required times. Accordingly, the timing in which we expand our operations may vary depending on geological, operational and financial developments, in addition to regulatory approvals from the ISA, among other factors, and these may impact our revenue and financial performance.

Nodule Collection, development and processing operations pose inherent risks and costs that may negatively impact our business.

Collection, development and processing operations involve many hazards and uncertainties, including, among others:

- metallurgical or other processing problems;
- technical and operational challenges in the collection and expansion of maritime collection activities;
- difficulties in transferring nodules to transport vessels and delivering nodules to port;
- industrial accidents;
- unusual and unexpected water conditions;
- unexpected seafloor conditions
- unexpected environmental conditions, including contamination or leakage;
- periodic interruptions due to inclement or hazardous weather conditions or other acts of nature;
- fires;
- piracy and disruptive action by non-governmental actors opposed to deep sea collection;
- organized labor disputes or work slow-downs;
- mechanical equipment failure and facility performance problems;
- the availability of financing, market demand, critical technology and equipment, and skilled labor; and
- the inability of suppliers to provide key process inputs like electricity, gas, coal and processing reagents on a timely basis at the prices that have been forecast.

These occurrences could result in damage to, or destruction of, production facilities, personal injury or death, environmental damage, delays in processing, increased production costs, asset write downs, monetary losses and legal liability, any of which could have an adverse effect on our results of operations and financial condition and adversely affect our projected development and production estimates. In addition, our operations could be interrupted by or negatively influenced by non-governmental actors which could negatively impact DeepGreen or its subsidiaries' ability to operate in the CCZ and international markets, obtain capital, collect, transport, process or sell metals, or otherwise conduct business.

DeepGreen relies on the willingness of EV and Battery metals consumers to acquire metals produced from deep sea collection operations. Some market proponents have recently expressed opposition to acquiring deep see derived metals, and if this position gains broad traction in the marketplace for EV and Battery metals, it could have a material impact on our business and operations.

Fluctuations in transportation costs or disruptions in transportation services or damage or loss during transport could decrease our competitiveness or impair our ability to supply polymetallic nodules, processed minerals or products to our customers, which could adversely affect our results of operations.

Once our subsidiaries have been able to successfully develop their properties, they will be required to transport minerals to facilities for processing. Furthermore, once they have reached a point of commercialization, we will need to transport our products to our future customers, wherever they may be located. Finding affordable and dependable transportation is important because it allows us to supply customers around the world. Labor disputes,

embargos, government restrictions, work stoppages, pandemics, derailments, damage or loss events, adverse weather conditions, vessel groundings inhibiting access to key navigation routes, other environmental events, changes to rail or ocean freight systems or other events and activities beyond our control could interrupt or limit available transport services, which could result in customer dissatisfaction and loss of sales potential and could materially adversely affect our results of operations.

Much of the equipment that we will need to accomplish our objectives has not been manufactured and/or tested.

Our subsidiaries will need to rely on high value equipment for collection and transport of materials. Much of this equipment, particularly as it pertains to sub-sea engineering and recovery systems, has yet to have completion of engineering, and has not been constructed and fully tested, and may not be suitable or may prove unreliable, and may not be delivered to us on a timely basis, thereby delaying our contemplated timetable. Moreover, our future needs with respect to sub-sea engineering and recovery systems have yet to be fully determined, and as such, the capital costs, performance, reliability, and maintenance associated with the necessary equipment is currently unknown. There can be no guarantees that the necessary sub-sea engineering and recovery systems can be developed, or if developed, that such systems will be deployable in an economically viable manner. Any equipment downtime or delayed mobilization of equipment may impact operations. Additionally, as we launch exploration, collection, and development initiatives, our subsidiaries may need to compete for the availability of suitable vessels and equipment, even though we have a close commercial relationship with our partners, Allseas and Maersk, there is a risk that certain vessels and equipment will be under long-term charter and will thus not be available to them when needed, if at all.

Risks related to DeepGreen's Operations and Industry

Actual capital costs, financing strategies, operating costs, production and economic returns may differ significantly from those we have anticipated and there can be no assurance that any future development activities will result in profitable collecting operations.

The actual operating costs of our subsidiaries to collect polymetallic nodules and transport and process such nodules on a commercial scale will depend upon changes in the availability of financing or partners who undertake capital developments in partnership with us, and prices of labor, equipment and infrastructure, shipping costs, variances in ore recovery from those currently assumed, operational risks, changes in governmental regulation, including taxation, environmental, permitting and other regulations and other factors, many of which are beyond our control. Due to any of these or other factors, our capital and operating costs may be significantly higher than those set forth in the NORI and TOML Technical Report Summaries prepared by AMC Consultants Ltd. ("AMC") and filed with the registration statement of which this proxy statement/prospectus forms a part (the "NORI Technical Report" and the "TOML Technical Report"). As a result of higher capital and operating costs, our financing ability may be impacted, and this may be further affected by lower commodity prices in the international markets that could impact production or economic returns which may differ significantly from those set forth in the NORI and TOML Technical Reports and there can be no assurance that any of our development activities will result in profitable operations.

We have a limited operating history, and there can be no assurance that we will be able to commercially develop our properties or achieve profitability in the future.

We have a limited operating history, and we expect that our losses will continue until we achieve profitable commercial production. NORI currently intends to explore and collect mineral resources in the NORI areas identified in the Exploration Contract executed by NORI with the ISA (the "NORI Areas"), and we hope to expand such operations if viable in certain other parts of the CCZ, including by TOML in the TOML areas identified in the Exploration Contract executed between TOML and the ISA (the "TOML Areas") and DGE in the Marawa areas identified in the Exploration Contract executed by Marawa with the ISA (the "Marawa Areas"). Although NORI expects to achieve early stage commercial production for NORI-D on or around 2024, there can be no assurance that it will be able to commercially develop these properties or that it will be able to generate profits in the future.

Our operating expenses and capital expenditures will increase in the future as consultants and new employees are engaged, equipment associated with advancing exploration is leased or purchased, and properties are developed. There can be no assurance that we will generate any revenues or achieve profitability, or that the assumed levels of expense associated with our exploration, development, and commercialization processes will prove to be accurate.

Our business is contingent on our ability to successfully identify, collect and process polymetallic nodules, and in doing so, we will need to rely on certain existing and future strategic relationships, some of which we may be unable to maintain and/or develop.

In conducting our business, we will rely on continuing existing strategic relationships as well as new relationships in a variety of disciplines, including the offshore equipment and services industries (such as our partnerships with Maersk and Allseas), the onshore mineral processing industry, and others involved in the mineral exploration industry. We will also need to continue to develop new relationships with third party contractors, as well as with certain regulatory and governmental departments.

For example, we have been working with Hatch, a global engineering, project management, and professional services firm, to develop onshore processing technology for the production of readily saleable copper and manganese products, as well as products such as high grade nickel and cobalt sulphates for the electric vehicle battery markets. In connection therewith, Hatch has developed a zero solid waste flowsheet. We are also party to certain agreements with Maersk and Maersk UK, pursuant to which Maersk and Maersk UK agreed to supply us with vessels and offshore services with respect to vessel operations and supplier management in order to support environmental studies within the NORI, TOML and Marawa Areas, though these arrangements are scheduled to terminate in 2022 unless extended by mutual agreement. Additionally, we are party to certain agreements with Allseas, pursuant to which, among other things, Allseas has agreed to design, engineer and construct an integrated off-shore collection system to collect nodules from NORI Areas, and to assist with shipping efforts thereafter. Allseas is contractually required to develop a test system to demonstrate this capability, but it is not certain that Allseas will convert, or will be able to convert such system into a full-scale commercial operation or that we will reach contractual terms with Allseas for such commercial arrangements.

There can be no assurance that we will be able to continue to maintain and develop our existing relationships, or that we will be able to form the new relationships that are required in order for our business to be successful. Additionally, one of our material agreements with a strategic partner includes performance-based metrics that will adjust depending on the success of our business and the trading activity in our shares. DeepGreen issued the Allseas Warrant to Allseas, which shall vest upon certain milestones into such number of shares that is based on the formula described therein, and which will be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination in accordance with its terms. As of June 1, 2022, the value of the Allseas Warrant will be determined by multiplying the total number of TMC Common Shares underlying the warrant by the price per TMC Common Share ("Warrant Credit Value"). In the event that the Warrant Credit Value is greater than $150,000,000, then on the vesting date of the Allseas Warrant, TMC shall receive a "credit" for the amount by which such Warrant Credit Value exceeds $150,000,000. TMC will be able to exchange such credit value for future goods and services from Allseas. However, if our common shares do not perform well, there is a chance that we will receive little or no such credit, in which case we will be required to pay more than is currently anticipated to Allseas in connection with the services that it is expected to provide. In addition, there can be no assurance that services will be required from Allseas to utilize any such credit.

The prevailing market prices of nickel, manganese, copper, cobalt, and other commodities will have a material impact on our ability to achieve commercial success.

The profitability of collection operations is significantly affected by changes in the market price of battery metals (cobalt, nickel and copper) and manganese and the cost of power, petroleum fuels, and oil, among other commodities and supply requirements. Prices of such metals are affected by numerous factors beyond our control, including: prevailing interest rates and returns on other asset classes; expectations regarding inflation, monetary policy and currency values; speculation; governmental and exchange decisions regarding the disposal of metal stockpiles; political and economic conditions; available supplies of battery metals from mine production, inventories and recycled metal; sales by holders and producers of battery metals; and demand for products containing nickel, manganese, copper and cobalt. The price of nickel, manganese, copper, cobalt and other minerals and oil has fluctuated widely in recent years. Depending on the prevailing price of nickel, manganese, copper, and cobalt, and the cost of power, chemical reagents, petroleum fuels and oil, cash flow from our collection operations and commercialization may not be sufficient to cover our operating costs or the costs to servicing any outstanding debt. In addition, our proposed full scale production plans would involve placing a large percentage of global manganese production in the market, and we may be constrained in our ability to sell such large volumes, or such production may negatively impact the market price of manganese, which would, in either case, negatively impact our overall economic position.

We are not currently party to any commodity hedging contracts, as we do not yet have any production. Debt financing may not be available on commercially reasonable terms, or at all.

We may be adversely affected by fluctuations in demand for nickel, manganese, copper, cobalt, and other commodities.

Because our revenue is expected to be from the collection and processing of minerals, changes in demand for, and taxes and other tariffs and fees imposed upon, such minerals and derived mineral products (most notably, nickel, manganese, copper, and cobalt) could significantly affect our profitability. A prolonged or significant economic contraction in the United States or worldwide could put downward pressure on market prices of minerals. Protracted periods of low prices for minerals could significantly reduce revenues and the availability of required development funds in the future. This could cause substantial reductions to, or a suspension of, our exploration, collecting and production operations, and impair asset values.

Demand for our minerals may be impacted by changes in supply dynamics and sources, and changes in demand for downstream products, including batteries for hybrid and electric vehicles that consume high volumes of the metals we intend to produce, as well as demand for manganese alloys used in steel-making, the targeted market for most of our manganese production. Lack of growth or material increases in new sources of supply in this or in any other related markets may adversely affect the demand for our minerals and any related products, and if the market for these critical existing and emerging technologies does not grow as we expect, grows more slowly than we expect, or if the demand for our products in these markets decreases, then our business, prospects, financial condition and operating results could be harmed. Notably, our financial success will depend in part on the expansion of the global manganese market to consume the additional volume of manganese that we intend to produce.

In contrast, extended periods of high commodity prices may create economic dislocations that could be destabilizing to the supply and demand of minerals, and ultimately to the broader markets. Periods of high market prices for our minerals are generally beneficial to our financial performance. However, strong prices also create economic pressure to identify or create new sources of supply and alternate technologies requiring consumption of metals that ultimately could depress future long-term demand for nickel, cobalt, copper and related products, and at the same time may incentivize development of competing properties.

We may experience difficulty in creating market acceptance for a novel manganese product.

We will be producing a novel manganese silicate product which does not have recognition in the marketplace with customers. Metallurgical testwork, market studies by CRU and initial engagement with customers indicate that this manganese silicate product will be a premium product as an input into silicomanagese alloy production that we believe will receive strong market acceptance. However mineral processing industries may be slow to change feed stocks and suppliers, even in the face of potential improvements.

Additionally, manganese silicate is not a conventional mineral product and may require additional approvals for export and import from our processing facilities to our future customers.

We operate in a highly competitive industry, and there are no assurances that our efforts will be successful.

The battery metals collection and processing industry is capital intensive and competitive. Production of battery metals and manganese alloys is largely dominated by Chinese competitors amongst other nation states and private contractors. These competitors may have greater financial resources, as well as other strategic advantages to operate, maintain, improve and possibly expand their facilities. Additionally, domestic Chinese resources firms have historically been able to produce minerals and/or process metals from land based operations at relatively low costs due to domestic economic and regulatory factors, including less stringent environmental and governmental regulations and lower labor and benefit costs. Many contractors currently hold ISA exploration leases to assess the value of polymetallic nodule fields for future collecting in the Area. Each of these various contractors are potential competitors to DeepGreen with respect to the collection of polymetallic nodules and the production of nickel, manganese, copper and cobalt products. We will be competing with many other contractors that may possess greater financial and/or technical resources. There is increasing competition from new and existing players in the search for polymetallic nodule deposits, the availability of marine exploration and support vessels, related marine equipment and specialized personnel, desirable exploration leases, suitable processing equipment, and available funds. There

is a risk that competitors may find more promising resources, identify or develop more economic technologies, enter into strategic partnerships that constrain our optionality, or may develop novel methods to process nodules into metals (either on the seafloor or on land) that are more economic than we currently contemplate.

We may become subject to pressure and lobbying from non-governmental organizations.

Like other businesses that operate in the resources industry, we may become subject to pressure and lobbying from non-governmental organizations, particularly with respect to environmental concerns, including potential damage to the ocean environment. There is a risk that the demands and actions of such non-governmental organizations may cause significant disruption to our business, which could have a material adverse effect on our operations and financial condition. It is possible that direct action from environmental groups could physically impact ongoing operation during both exploration and development project phases and during commercial operations.

Our profitability could be adversely affected if we fail to maintain satisfactory labor relations.

Our exploration and production initiatives will be dependent upon the efforts of our employees. Although none of our employees are currently subject to any collective bargaining arrangements, our employees could, in the future, choose to be represented as a collective unit, which may result in labor disputes, work stoppages or other disruptions in our production efforts that could adversely affect us.

Our business is subject to a variety of risks, some of which may not be covered by our future or existing insurance policies.

In the course of the exploration, development, and production of our mineral resource properties, we may be subject to a variety of risks that could result in (i) damage to, or destruction of, transportation vessels and processing facilities, (ii) personal injury or death, (iii) environmental damage, (iv) delays in collecting, transporting or processing, (v) monetary losses, (vi) natural disasters, (vii) environmental matters, and (viii) legal liability, among others. It is not always possible to fully insure against such risks, and we may determine not to insure against all such risks as a result of high premiums or for other reasons. Should such liabilities arise, they could reduce or eliminate any future profitability and result in an increase in cost and a decline in the value of our securities. We cannot be certain that insurance for some or all of these risks will be available on acceptable terms or conditions, if at all, and in some cases, coverage may not be acceptable or may be considered too expensive relative to the perceived risk.

Work stoppages or similar difficulties could significantly disrupt our operations, reduce our revenues and materially adversely affect our results of operations.

A work stoppage by any of the third-parties providing services in connection with our operations or those of our strategic partners (such as for on-shore or off-shore operations) could significantly disrupt our activities, reduce our future revenues and materially adversely affect our results of operations.

A shortage of skilled technicians and engineers may further increase operating costs, which could materially adversely affect our results of operations.

Efficient collection, transport and processing using modern techniques and equipment requires skilled technicians and engineers. In addition, our optimization and eventual downstream efforts will significantly increase the number of skilled operators, maintenance technicians, engineers and other personnel required to successfully operate our business. In the event that we are unable to hire, train and retain the necessary number of skilled technicians, engineers and other personnel there could be an adverse impact on our labor costs and our ability to reach anticipated production levels in a timely manner, which could have a material adverse effect on our results of operations.

We depend on key personnel for the success of our business.

We depend on the services of our senior management team, our board, our strategic partners and other key personnel. The loss of the services of any member of senior management, our board or a key employee, or similar personnel within our strategic partners could have an adverse effect on our business. We and our partners may not be able to locate, attract or employ on acceptable terms qualified replacements for senior management, board or other key employees if their services are no longer available.

Our growth will depend on our ability, and on the ability of our management team, board and other employees, to execute on our plans and expand our operations and controls while maintaining effective cost controls.

Deep sea exploration, collection, and production is a burgeoning industry, and our ability to implement our strategy requires effective planning and management control systems. Our plans may place a significant strain on our management and on our operational, financial and personnel resources. As such, our future growth and prospects will depend on our ability to manage this growth and to continue to expand and improve operational, financial and management information and quality control systems on a timely basis, while at the same time maintaining effective cost controls. Any failure to expand and improve operational, financial and management information and quality control systems in line with our growth could have a material adverse effect on our business, financial condition and results of operations. There are also risks associated with establishing and maintaining systems of internal controls.

The COVID-19 pandemic could have an adverse effect on our business.

The current COVID-19 pandemic has materially impacted the national and global economy and commodity and financial markets. The full extent and impact of the COVID-19 pandemic is unknown and to date has included, among other things, extreme volatility in financial markets, a slowdown in economic activity, volatility in commodity prices, and an increased possibility of a global recession. The response to COVID-19 has led to significant restrictions on travel, temporary business closures, quarantines, global stock market volatility and a general reduction in consumer activity and sentiment, globally. The outbreak has affected our business and operations and may continue to do so by, among others, increasing the cost of operations and reducing employee productivity, limiting travel of our personnel, adversely affecting the health and welfare of our personnel, or preventing or delaying important third party service providers from performing normal and contracted activities crucial to the operation of our business.

The outbreak has resulted in significant governmental measures being implemented to control the spread of the virus, including, among others, restrictions on manufacturing and the movement of employees in many regions of the U.S. and other countries. These disruptions could continue to impact the market for minerals, which in turn could impact our business or business prospects.

Decisions beyond our control, such as canceled events, restricted travel, barriers to entry, temporary closures or limited availability of county, state or federal government agencies, or other factors, may affect our ability to perform collecting operations, corporate activities, and other actions that would normally be accomplished without such limitations. For instance, the final exploitation regulations were expected to be adopted by the ISA during 2020 but were delayed due to COVID-19. The extent to which the COVID-19 outbreak will further impact our operations, our business and the economy is highly uncertain. We cannot predict the impact of the COVID-19 pandemic, but it may materially and adversely affect our business, financial condition and results of operations.

We are dependent upon information technology systems, which are subject to cyber threats, disruption, damage and failure.

We depend upon information technology systems in the conduct of operations. Such information technology systems are subject to disruption, damage or failure from a variety of sources, including, without limitation, computer viruses, security breaches, cyber-attacks, natural disasters and defects in design. Cybersecurity incidents, in particular, are evolving and include, but are not limited to, malicious software, attempts to gain unauthorized access to data and other electronic security breaches that could lead to disruptions in systems, unauthorized release of confidential or otherwise protected information or the corruption of data. Various measures have been implemented to manage our risks related to information technology systems and network disruptions. However, given the unpredictability of the timing, nature and scope of information technology disruptions, we could potentially be subject to downtimes, operational delays, the compromising of confidential or otherwise protected information, destruction or corruption of data, security breaches, other manipulation or improper use of our systems and networks or financial losses from remedial actions, any of which could have a material adverse effect on our business, operating results and financial condition.

Our ability to generate revenue will be diminished if we are unable to compete with substitutions for the minerals that we intend to process.

Technology changes rapidly in the industries and end markets that utilize our materials. If these industries introduce new technologies or products that no longer require the minerals that we intend to collect and process, or if suitable substitutes become available, it could result in a decline in demand for our materials. If the demand for our materials decreases, it will have a material adverse effect on our business and the results of our operations and financial condition.

We are reliant on third parties to conduct independent analyses with respect to our business, and any inaccuracies in such analyses could have a material adverse effect on our collection and development objectives.

We rely upon third party consultants, engineers, analysts, scientists, and others to provide analyses, reviews, reports, advice, and opinions regarding our potential projects. For example, the NORI Technical Report and TOML Technical Report contain mineral resource estimates and other information with respect to our contract areas. There is a risk that such analyses, reviews, reports, advice, opinions, and projects are incorrect, in particular with respect to resource estimation, process development, and recommendations for products to be produced, as well as with respect to economic assessments, including estimating the capital and operating costs of our project and forecasting potential future revenue streams. Uncertainties are also inherent in such estimations.

We may be subject to legal proceedings.

Due to the nature of our business, we may be subject to regulatory investigations, claims, lawsuits and other proceedings in the ordinary course of our business. The results of these legal proceedings cannot be predicted with certainty due to the uncertainty inherent in litigation, including the effects of discovery of new evidence or advancement of new legal theories, the difficulty of predicting decisions of judges and juries and the possibility that decisions may be reversed on appeal. We can provide no assurances that these matters will not have a material adverse effect on our business.

Our future growth may be dependent upon consumers' willingness to adopt electric vehicles.

Given that the minerals we intend to collect and process are contemplated to be significantly linked to growing metals demand in batteries for hybrid and electric vehicles, our growth is highly dependent upon the adoption by consumers of, and we are subject to an elevated risk of any reduced demand for, alternative fuel vehicles in general and electric vehicles in particular. While it has been projected that demand for such electric vehicles will surge over time, if the market for electric vehicles does not develop as we expect, or develops more slowly than we expect, our business, prospects, financial condition and operating results may be harmed. The market for alternative fuel vehicles is relatively new, rapidly evolving, characterized by rapidly changing technologies, price competition, additional competitors, evolving government regulation and industry standards, frequent new vehicle announcements and changing consumer demands and behaviors. Factors that may influence the adoption of alternative fuel vehicles, and specifically electric vehicles, include:

- perceptions about electric vehicle quality, safety, design, performance and cost, especially if adverse events or accidents occur that are linked to the quality or safety of electric vehicles;
- the material composition necessary for electric vehicle batteries and the potential of change in chemistry and engineering requirements that may move away from expected demand for nickel and cobalt;
- perceptions about vehicle safety in general, in particular safety issues that may be attributed to the use of advanced technology, including vehicle electronics and regenerative braking systems;
- the limited range over which electric vehicles may be driven on a single battery charge;
- the decline of an electric vehicle's range resulting from deterioration over time in the battery's ability to hold a charge;
- concerns about electric grid capacity and reliability;
- the availability of alternative fuel vehicles, including plug-in hybrid electric vehicles;
- improvements in the fuel economy of the internal combustion engine;
- the availability of service for electric vehicles;
- the environmental consciousness of consumers;
- volatility in the cost of oil and gasoline;
- consumers' perceptions of the dependency of the United States on oil from unstable or hostile countries;
- government regulations and economic incentives promoting fuel efficiency and alternate forms of energy;

- access to charging stations, standardization of electric vehicle charging systems and consumers' perceptions about convenience and cost to charge an electric vehicle;
- the availability of tax and other governmental incentives to purchase and operate electric vehicles or future regulation requiring increased use of nonpolluting vehicles;
- perceptions about and the actual cost of alternative fuel; and
- macroeconomic factors.

Developments in alternative technologies or improvements in the internal combustion engine may materially adversely affect the demand for electric vehicles, and thus for the minerals that we intend to collect and process.

Significant developments in alternative technologies, such as advanced diesel, ethanol, fuel cells or compressed natural gas, or improvements in the fuel economy of the internal combustion engine, may materially and adversely affect demand for the minerals that we intend to harvest and process in ways we do not currently anticipate. Any such reductions in demand could have a material adverse effect on our business and prospects.

DeepGreen has identified a material weakness in its internal control over financial reporting as of December 31, 2020 which, if not corrected, could affect the reliability of its consolidated financial statements and have other adverse consequences.

As a private company, DeepGreen has not been required to document and test its internal controls over financial reporting, nor has management been required to certify the effectiveness of its internal controls, and its auditors have not been required to opine on the effectiveness of its internal control over financial reporting. Similarly, DeepGreen has not been subject to the SEC's internal control reporting requirements. Following the Business Combination, DeepGreen will become subject to these requirements.

In the course of preparing the financial statements that are included in this proxy statement/prospectus, DeepGreen has identified a material weakness in its internal control over financial reporting as of December 31, 2020, which relates to a deficiency in the design and operation of the financial statement close and reporting controls, including maintaining sufficient written policies and procedures and the need to use appropriate technical expertise when accounting for complex or non-routine transactions. A material weakness is a deficiency or combination of deficiencies in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of its financial statements would not be prevented or detected on a timely basis. These deficiencies could result in misstatements to DeepGreen's financial statements that would be material and would not be prevented or detected on a timely basis.

DeepGreen's management has concluded that this material weakness is due to the fact that, prior to this proxy statement/prospectus, DeepGreen was a private company with limited resources. DeepGreen did not have the necessary business processes and related internal controls, or the appropriate resources or level of experience and technical expertise, that would be required to oversee financial reporting processes or to address the accounting and financial reporting requirements. DeepGreen's management is in the process of developing a remediation plan. The material weakness will not be considered remediated until management designs and implements effective controls that operate for a sufficient period of time and management has concluded, through testing, that these controls are effective. The material weakness remains unremediated as of March 31, 2021.

DeepGreen recently appointed a chief financial officer and is currently recruiting additional finance personnel and has engaged a reputable independent accounting group to undertake a review and gap analysis of current systems and processes in order to develop a remediation plan. If not remediated, this material weakness could result in material misstatements to DeepGreen's annual or interim financial statements that would not be prevented or detected on a timely basis, or in the delayed filing of required periodic reports. If DeepGreen is unable to assert that its internal control over financial reporting is effective, or when required in the future, if DeepGreen's independent registered public accounting firm is unable to express an unqualified opinion as to the effectiveness of the internal control over financial reporting, investors may lose confidence in the accuracy and completeness of DeepGreen's financial reports, the market price of DeepGreen's securities could be adversely affected and DeepGreen could become subject to litigation or investigations by NASDAQ, the SEC, or other regulatory authorities, which could require additional financial and management resources.

Risks related to our Intellectual Property

We may not be able to adequately protect our intellectual property rights. If we fail to adequately enforce or defend our intellectual property rights, our business may be harmed.

Much of the technology used in the markets in which we compete is or may become protected by patents and trade secrets, and our commercial success will depend in significant part on our ability to access, obtain and maintain patent and trade secret protection for future products and methods or those of any of our strategic partners such as Allseas or onshore processing partners. To compete in these markets, we rely or may need to rely on a combination of trade secret protection, nondisclosure and licensing agreements, patents and trademarks to establish and protect our proprietary intellectual property rights. Our intellectual property rights (or those of our partners) may be challenged or infringed upon by third parties, or we may be unable to maintain, renew or enter into new license agreements with third-party owners of intellectual property on reasonable terms. In addition, our intellectual property may be subject to infringement or other unauthorized use outside of the United States. In such case, our ability to protect our intellectual property rights by legal recourse or otherwise may be limited, particularly in countries where laws or enforcement practices are undeveloped or do not recognize or protect intellectual property rights to the same extent as the United States. Unauthorized use of our intellectual property rights (or those of our partners) or our inability (or the inability of our partners) to preserve our existing intellectual property rights (or those of our partners) could adversely impact our competitive position and results of operations. The loss of our patents could reduce the value of the related products. In addition, the cost to litigate infringements of our patents, or the cost to defend ourselves against patent infringement actions by others, could be substantial and, if incurred, could materially affect our business and financial condition.

Proprietary trade secrets and unpatented know-how may become important to our business. We will likely rely on trade secrets to protect certain aspects of our business systems and designs, especially where we do not believe that patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. Our employees, consultants, contractors, outside scientific collaborators and other advisors may unintentionally or willfully disclose our confidential information to competitors, and confidentiality agreements may not provide an adequate remedy in the event of unauthorized disclosure of confidential or proprietary information. Enforcing a claim that a third party illegally obtained and is using our trade secrets is expensive and time consuming, and the outcome is unpredictable. Moreover, our competitors may independently develop equivalent knowledge, methods and know-how. Failure to obtain or maintain trade secret protection could adversely affect our competitive business position.

We or our partners may not be able to obtain necessary patents and the legal protection afforded by any patents may not adequately protect our or our partners' rights or permit us to gain or keep any competitive advantage.

Our ability (or that of our partners) to obtain necessary patents is uncertain, and the legal protection to be afforded by any patents we (or they) may be issued in the future may not adequately protect our (or their) rights or permit us (or them) to gain or keep any competitive advantage necessary for our operations or our partnerships. In addition, the specific content required of patents and patent applications that are necessary to support and interpret patent claims is highly uncertain due to the complex nature of the relevant legal, scientific and factual issues. Changes in either patent laws or interpretations of patent laws in the United States or elsewhere may diminish the value of our intellectual property or narrow the scope of our patent protection. Even if patents are issued regarding our products and processes, our competitors may challenge the validity of those patents. Patents also will not protect our products and processes if competitors devise ways of making products without infringing our patents.

If we infringe, or are accused of infringing, on the intellectual property rights of third parties, it may increase our costs or prevent us from being able to commercialize new products.

There is a risk that we (or our partners) may infringe, or may be accused of infringing, the proprietary rights of third parties under patents and pending patent applications belonging to third parties that may exist in the United States and elsewhere in the world that relate to our products and processes (or those of our strategic partners). Because the patent application process can take several years to complete, there may be currently pending applications that may later result in issued patents that cover our products and processes. In addition, our products and processes may infringe existing patents.

Defending ourselves against third-party claims, including litigation in particular, would be costly and time consuming and would divert management's attention from our business, which could lead to delays in our exploration, collecting, processing, and commercialization efforts. If third parties are successful in their claims, we might have to pay substantial damages or take other actions that are adverse to our business. As a result of intellectual property infringement claims, or to avoid potential claims, we might:

- be prohibited from, or delayed in, selling or licensing some of our products or using some of our processes unless the patent holder licenses the patent to us, which it is not required to do;
- be required to pay substantial royalties or grant a cross license to our patents to another patent holder; or
- be required to redesign a product or process so it does not infringe a third party's patent, which may not be possible or could require substantial funds and time.

In addition, we could be subject to claims that our employees, or we, have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of third parties.

If we are unable to resolve claims that may be brought against us by third parties related to their intellectual property rights on terms acceptable to us, we may be precluded from offering some of our products or using some of our processes.

In addition, we have not obtained definitive global trademark protection for the name "The Metals Company" and we may not be able to secure such protection over time. If we are unable to secure such protection, we may need to rebrand or otherwise modify our name, which could result in costs, delays and loss of market recognition.

Risks related to Ownership of DeepGreen's Common Shares Following the Business Combination

Our business is capital intensive, and we may be required to raise additional funds in the future in order to accomplish our objectives.

The continuing exploration and development of the NORI, TOML and Marawa Contract Area may depend upon our ability to obtain dilutive and/or non-dilutive financing through debt financing, equity financing, joint ventures, or other means. Additionally, the actual amount of capital raised for our projects may vary materially from our current estimates, which could require that we raise additional funds. There is no assurance that we will be successful in obtaining the required financing for these or other purposes, including for general working capital, or that any funds raised will be sufficient for the purposes contemplated. We will not initially have any producing properties and will have no source of significant operating cash flow until 2024 at the earliest. There is no precedent for projects like ours, and therefore, debt financing may not be available in commercially available terms, or at all. Failure to obtain additional financing on a timely basis could cause us to reduce or terminate our operations. There can be no certainty that capital will be available to us on acceptable terms.

If additional funds are raised through further issuances of equity or convertible debt securities, existing shareholders could suffer significant dilution, and any new equity securities issued could have rights, preferences and privileges superior to those they possess prior to such issuances. Any debt financing secured in the future could involve restrictive covenants relating to capital raising activities and other financial and operational matters, which may make it more difficult for us to obtain additional capital and to pursue business opportunities, including potential acquisitions.

We may incur debt in the future, and our ability to satisfy our obligations thereunder remains subject to a variety of factors, many of which are not within our control.

We may seek to incur debt in the future in order to fund our exploration and operational programs, which would reduce our financial flexibility and could have a material adverse effect on our business, financial condition or results of operation.

Should we incur debt, our ability to satisfy any resulting debt obligations and to reduce our level of indebtedness will depend on future performance. General economic conditions, mineral prices, and financial, business and other factors will have an impact on our operations and future performance, and many of these factors are beyond our control. As such, we cannot assure investors that we will be able to generate sufficient cash flow to

pay the interest on any debt, or that future working capital, borrowings, or equity financing will be available to pay or refinance such debt or meet future debt covenants. Factors that will affect our ability to raise cash through an offering of securities or a refinancing of any debt include financial market conditions, the value of our assets, and our performance at the time we are seeking to raise capital. We cannot assure investors that we will have sufficient funds to make such payments. If we do not have sufficient funds and are otherwise unable to negotiate renewals of our current borrowings or to arrange for new financing, we might be required to take measures to generate liquidity, such as selling some or all of our assets. Any such sales could have a material adverse effect on our business, operations and financial results. Moreover, failure to obtain additional financing, if required, on a timely basis, could cause us to reduce or delay our proposed operations.

We may need to raise additional capital in order to complete our programs and commence commercial operations and there is no assurance that we will be able to obtain adequate financing in the future or that such financing will be available to us on advantageous terms.

The market price of our common shares will depend on factors that fall outside of our control, and thus may not be predictable.

The market price of our common shares may be subject to wide fluctuations in response to many factors, including variations in our operating results and the results of our subsidiaries, divergence in financial results from analysts' expectations, changes in metal prices, changes in bond yields, changes in earnings estimates by stock market analysts, changes in our business prospects, general economic conditions, legislative changes, and other events and factors outside of our control. In addition, stock markets have from time to time experienced extreme price and volume fluctuations, which, as well as general economic and political conditions, could adversely affect the market price for our common shares.

Because there are no current plans to pay cash dividends on our common shares for the foreseeable future, you may not receive any return on investment unless you sell your common shares for a price greater than that which you paid for it.

We intend to retain future earnings, if any, for future operations, expansion and debt repayment, and there are no current plans to pay any cash dividends for the foreseeable future. The declaration, amount, and payment of any future dividends on our common shares will be at the sole discretion of our board of directors. Our board of directors may take into account general and economic conditions, our financial condition and results of operations, our available cash and current and anticipated cash needs, capital requirements, contractual, legal, tax, and regulatory restrictions, implications on the payment of dividends by us to our stockholders, and such other factors as our board of directors may deem relevant. In addition, our ability to pay dividends may be limited by covenants of any future indebtedness we may in the future incur. As a result, you may not receive any return on an investment in our common shares unless you sell your common shares for a price greater than that which you paid for it.

TMC is expected to be a PFIC, which could result in adverse U.S. federal income tax consequences to U.S. Holders.

TMC is expected to be a passive foreign investment company ("*PFIC*") for the tax year that includes the Business Combination. As a result, U.S. Holders (defined below) of TMC Common Shares may be subject to certain adverse U.S. federal income tax consequences and may be subject to additional reporting requirements. See "*U.S. Federal Income Tax Considerations —Tax Consequences of Ownership and Disposition of TMC Common Shares and TMC Warrants—Passive Foreign Investment Company Rules*" for a more detailed discussion with respect to TMC's PFIC status and the application of the PFIC rules. U.S. Holders of TMC Common Shares are urged to consult their tax advisors regarding the application of the PFIC rules to them.

Risks Related to the Business Combination and SOAC

Unless the context otherwise requires, any reference in this section of this proxy statement/prospectus to the "SOAC," "we," "us" or "our" refers to SOAC prior to the Business Combination and to TMC and its subsidiaries following the Business Combination.

Our initial shareholders have entered into the Sponsor Letter Agreement with us to vote in favor of the Business Combination, regardless of how our public shareholders vote.

Pursuant to the Sponsor Letter Agreement, our initial shareholders have agreed, among other things, to vote all of their public shares and Class B ordinary shares in favor of all the proposals being presented at the extraordinary general meeting, including the Business Combination Proposal and the transactions contemplated thereby (including the Share Exchange and Amalgamation). As of the date of this proxy statement/prospectus, our initial shareholders own approximately 20% of the issued and outstanding ordinary shares (excluding the private placement shares underlying the private placement warrants).

Neither the SOAC Board nor any committee thereof obtained a third-party valuation in determining whether or not to pursue the Business Combination.

Neither the SOAC Board nor any committee thereof is required to obtain an opinion from an independent investment banking or accounting firm that the price that SOAC is paying for DeepGreen is fair to SOAC from a financial point of view. Neither the SOAC Board nor any committee thereof obtained a third party valuation in connection with the Business Combination. In analyzing the Business Combination, the SOAC Board and management conducted due diligence on DeepGreen and researched the industry in which DeepGreen operates. The SOAC Board reviewed, among other things, financial due diligence materials prepared by professional advisors, including financial due diligence reports and tax due diligence reports, financial and market data information on selected comparable companies, the implied purchase price multiple of DeepGreen and the financial terms set forth in the Business Combination Agreement, and concluded that the Business Combination was in the best interest of its shareholders. Accordingly, investors will be relying solely on the judgment of the SOAC Board and management in valuing DeepGreen, and the SOAC Board and management may not have properly valued DeepGreen's business. The lack of a third-party valuation may also lead an increased number of shareholders to vote against the Business Combination or demand redemption of their shares, which could potentially impact SOAC's ability to consummate the Business Combination.

The projected financial information considered by SOAC may not be realized, which may adversely affect the market price of TMC Common Shares following the completion of the Business Combination.

In performing its financial analyses related to the Business Combination, SOAC relied on, among other things, certain non-public internal financial projections (the "DeepGreen unaudited prospective financial information") regarding DeepGreen's anticipated future operations. Please see the section entitled "*Proposal No. 2 — The Business Combination Proposal — Certain DeepGreen Projected Financial Information*." The DeepGreen unaudited prospective information was prepared by, or at the direction of, the management of DeepGreen. The DeepGreen unaudited prospective financial information was not prepared with a view towards public disclosure or compliance with the published guidelines of the SEC or the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information. These projections and forecasts are inherently based on various estimates and assumptions that are subject to the judgment of those preparing them. These projections and forecasts are also subject to significant regulatory, economic, competitive, industry and other uncertainties and contingencies, all of which are difficult or impossible to predict and many of which are beyond the control of DeepGreen. There can be no assurance that TMC's financial condition following the Business Combination will be consistent with those set forth in such projections and forecasts, which could have an adverse impact on the market price of the TMC Common Shares or the financial position of TMC following the Business Combination.

The COVID-19 pandemic triggered an economic crisis which may delay or prevent the consummation of the Business Combination.

In December 2019, a coronavirus ("COVID-19") outbreak was reported in China, and, in March 2020, the World Health Organization declared it a pandemic. Since being initially reported in China, the coronavirus has spread throughout the world and has resulted in unprecedented restrictions and limitations on operations of many businesses, educational institutions and governmental entities, including in the United States and Canada. Given the ongoing and dynamic nature of the COVID-19 crisis, it is difficult to predict the impact on the businesses of SOAC, DeepGreen and TMC, and there is no guarantee that efforts by SOAC, DeepGreen and TMC to address the adverse impacts of COVID-19 will be effective. If SOAC or DeepGreen are unable to recover from a business disruption on a timely basis, the Business Combination and TMC's business and financial conditions and results of operations

following the completion of the Business Combination would be adversely affected. The Business Combination may also be delayed and adversely affected by the coronavirus pandemic, and thus become more costly. Each of SOAC and DeepGreen may also incur additional costs to remedy damages caused by such disruptions, which could adversely affect its financial condition and results of operations.

Since the initial shareholders, including SOAC's directors and executive officers, have interests that are different, or in addition to (and which may conflict with), the interests of our shareholders, a conflict of interest may have existed in determining whether the Business Combination with DeepGreen is appropriate as our initial business combination. Such interests include that our initial shareholders will lose their entire investment in SOAC if the Business Combination is not completed.

When you consider the recommendation of the SOAC Board in favor of approval of the Business Combination Proposal, you should keep in mind that the our initial shareholders have interests in such proposal that are different from, or in addition to (and may conflict with), those of SOAC shareholders and warrant holders generally.

These interests include, among other things, the interests listed below:

- the fact that our initial shareholders have agreed not to redeem any Class A ordinary shares held by them in connection with a shareholder vote to approve a proposed initial business combination;
- the fact that Sponsor paid an aggregate of $25,000 for the 7,500,000 Class B ordinary shares currently owned by the Sponsor and the initial shareholders and such securities will have a significantly higher value at the time of the Business Combination;
- the fact that Sponsor purchased 9,500,000 Private Placement Warrants, each exercisable to purchase one Class A ordinary share at $11.50 per share, at a price of $1.00 per warrant ($9,500,000 in the aggregate), that would be worthless if a business combination is not consummated by November 8, 2021 (unless such date is extended in accordance with the Existing Governing Documents);
- the fact that our initial shareholders have agreed to waive their rights to liquidating distributions from the trust account with respect to any ordinary shares (other than public shares) held by them if SOAC fails to complete an initial business combination by November 8, 2021 (although they will be entitled to liquidating distributions from the trust account with respect to any public shares they hold if SOAC fails to complete an initial business combination prior to the Combination Date (as defined in the Business Combination Agreement));
- the fact that the Amended and Restated Registration Rights Agreement will be entered into by Sponsor and our initial shareholders;
- the fact that, at the option of Sponsor, any amounts outstanding under any loan made by Sponsor or any of its affiliates to SOAC in an aggregate amount of up to $1,500,000 may be converted into warrants of TMC at a price of $1.00 per warrant at the option of the lender;
- the continued indemnification of SOAC's directors and officers and the continuation of SOAC's directors' and officers' liability insurance after the Business Combination (i.e., a "tail policy");
- the fact that Sponsor and the initial shareholders will lose their entire investment in SOAC and will not be reimbursed for any out-of-pocket expenses if an initial business combination is not consummated by November 8, 2021; and
- the fact that SOAC may be entitled to distribute or pay over funds held by SOAC outside the trust account to Sponsor or any of its affiliates prior to the Closing.

See "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for additional information on interests of SOAC's directors and executive officers.

The personal and financial interests of the initial shareholders as well as SOAC's directors and executive officers may have influenced their motivation in identifying and selecting DeepGreen as a business combination target, completing an initial business combination with DeepGreen and influencing the operation of the business following the initial business combination. In considering the recommendations of the SOAC Board to vote for the proposals, its shareholders should consider these interests.

The exercise of SOAC's directors' and executive officers' discretion in agreeing to changes or waivers in the terms of the Business Combination may result in a conflict of interest when determining whether such changes to the terms of the Business Combination or waivers of conditions are appropriate and in SOAC's shareholders' best interest.

In the period leading up to the closing of the Business Combination, events may occur that, pursuant to the Business Combination Agreement, would require SOAC to agree to amend the Business Combination Agreement, to consent to certain actions taken by DeepGreen or to waive rights that SOAC is entitled to under the Business Combination Agreement. Such events could arise because of changes in the course of DeepGreen's business, a request by DeepGreen to undertake actions that would otherwise be prohibited by the terms of the Business Combination Agreement or the occurrence of other events that would have a material adverse effect on DeepGreen's business and would entitle SOAC to terminate the Business Combination Agreement. In any of such circumstances, it would be at SOAC's discretion, acting through its board of directors, to grant its consent or waive those rights. The existence of financial and personal interests of one or more of the directors described in the preceding risk factors may result in a conflict of interest on the part of such director(s) between what he or they may believe is best for SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining whether or not to take the requested action. As of the date of this proxy statement/prospectus, SOAC does not believe there will be any changes or waivers that SOAC's directors and executive officers would be likely to make after shareholder approval of the Business Combination Proposal has been obtained. While certain changes could be made without further shareholder approval, SOAC will circulate a new or amended proxy statement/prospectus and resolicit SOAC's shareholders if changes to the terms of the transaction that would have a material impact on its shareholders are required prior to the vote on the Business Combination Proposal.

The NYSE (or NASDAQ, following the Business Combination) may delist SOAC's securities from trading on its exchange, which could limit investors' ability to make transactions in the SOAC's securities and subject SOAC to additional trading restrictions.

SOAC's ordinary shares, public warrants and units are currently listed on the NYSE and it is a condition to DeepGreen's obligations to complete the Business Combination that SOAC materially comply with its covenant that the Company's Class A ordinary shares and Class B ordinary shares shall have been approved for listing on the NYSE or NASDAQ.

However, SOAC cannot assure you that SOAC's securities will continue to be listed on the NYSE during the pendency of the Business Combination or NASDAQ after the Effective Time. In order to continue listing our securities on the NYSE prior to the Business Combination, we must maintain certain financial, share price and, subject to change as a result of recent rule changes proposed by the NYSE, distribution levels. Generally, we must maintain a minimum market capitalization (generally $50,000,000) and a minimum number of holders of our securities (currently 300 public holders). In addition, our units will not be traded after completion of the Business Combination, and, in connection with the Business Combination and as a condition to DeepGreen's obligations to complete the Business Combination, SOAC is required to demonstrate compliance with the NASDAQ's initial listing requirements, which are more rigorous than the NYSE's continued listing requirements, in order to obtain the listing of SOAC's securities on the NASDAQ. In addition to the listing requirements for SOAC's Class A ordinary shares, the NASDAQ imposes listing standards on warrants. SOAC cannot assure you that SOAC will be able to meet those initial listing requirements, in which case DeepGreen will not be obligated to complete the Business Combination. In addition, it is possible that SOAC's Class A ordinary shares and public warrants will cease to meet the NASDAQ listing requirements following the Business Combination.

If the NYSE or NASDAQ delists SOAC's securities from trading on its exchange and the Company is not able to list its securities on another national securities exchange, SOAC expects that SOAC's securities could be quoted on an over-the-counter market. If this were to occur, the Company could face significant material adverse consequences, including:

- a limited availability of market quotations for its securities;
- reduced liquidity for its securities;

- a determination that SOAC's Class A ordinary shares are "penny stocks" which will require brokers trading in the common shares to adhere to more stringent rules and possibly result in a reduced level of trading activity in the secondary trading market for SOAC's securities;
- a limited amount of news and analyst coverage; and
- a decreased ability to issue additional securities or obtain additional financing in the future.

The National Securities Markets Improvement Act of 1996, which is a federal statute, prevents or preempts the states from regulating the sale of certain securities, which are referred to as "covered securities." Because our units and our Class A ordinary shares and warrants are listed on the NYSE, our units, Class A ordinary shares and warrants, qualify as covered securities under the statute. Although the states are preempted from regulating the sale of our securities, the federal statute does allow the states to investigate companies if there is a suspicion of fraud, and, if there is a finding of fraudulent activity, then the states can regulate or bar the sale of covered securities in a particular case. While we are not aware of a state having used these powers to prohibit or restrict the sale of securities issued by blank check companies, other than the State of Idaho, certain state securities regulators view blank check companies unfavorably and might use these powers, or threaten to use these powers, to hinder the sale of securities of blank check companies in their states. Further, if we were no longer listed on the NYSE or NASDAQ, our securities would not qualify as covered securities under the statute and we would be subject to regulation in each state in which we offer our securities.

Subsequent to consummation of the Business Combination, we may be required to subsequently take write-downs or write-offs, restructurings and impairments or other charges that could have a significant negative effect on our financial condition, results of operations and the share price of our securities, which could cause you to lose some or all of your investment.

We cannot assure you that the due diligence conducted in relation to DeepGreen has identified all material issues or risks associated with DeepGreen, its business or the industry in which it competes. As a result of these factors, we may incur additional costs and expenses and we may be forced to later write-down or write-off assets, restructure our operations, or incur impairment or other charges that could result in our reporting losses. Even if our due diligence has identified certain risks, unexpected risks may arise and previously known risks may materialize in a manner not consistent with our preliminary risk analysis. If any of these risks materialize, this could have a material adverse effect on our financial condition and results of operations and could contribute to negative market perceptions about our securities or TMC. Accordingly, any shareholders of SOAC who choose to remain TMC shareholders following the Business Combination could suffer a reduction in the value of their shares and warrants. Such shareholders are unlikely to have a remedy for such reduction in value unless they are able to successfully claim that the reduction was due to the breach by our officers or directors of a duty of care or other fiduciary duty owed to them, or if they are able to successfully bring a private claim under securities laws that the registration statement or proxy statement/prospectus relating to the Business Combination contained an actionable material misstatement or material omission.

Our ability to successfully effect the Business Combination and to be successful thereafter will be dependent upon the efforts of key personnel of TMC, some of whom may be from SOAC and DeepGreen, and some of whom may join TMC following the Business Combination. The loss of key personnel or the hiring of ineffective personnel after the Business Combination could negatively impact the operations and profitability of TMC.

Our ability to successfully effect the Business Combination and be successful thereafter will be dependent upon the efforts of our key personnel. Although some of SOAC's key personnel may remain with the target business in senior management or advisory positions following our Business Combination, we expect TMC's current management to remain in place. We cannot assure you that we will be successful in integrating and retaining such key personnel, or in identifying and recruiting additional key individuals we determine may be necessary following the Business Combination.

The unaudited pro forma financial information included elsewhere in this proxy statement/prospectus may not be indicative of what TMC's actual financial position or results of operations would have been.

The unaudited pro forma financial information in this proxy statement/prospectus is presented for illustrative purposes only and has been prepared based on a number of assumptions including, but not limited to, DeepGreen

being considered the accounting acquirer in the Business Combination, the amount of debt obligations and cash and cash equivalents of DeepGreen at the Closing and the number of public shares that are redeemed in connection with the Business Combination. Accordingly, such pro forma financial information may not be indicative of our future operating or financial performance and our actual financial condition and results of operations may vary materially from our pro forma results of operations and balance sheet contained elsewhere in this proxy statement/prospectus, including as a result of such assumptions not being accurate. Additionally, the final acquisition accounting adjustments could differ materially from the unaudited pro forma adjustments presented in this proxy statement/prospectus. Any increase or decrease in the fair value of the assets acquired and liabilities assumed, as compared to the information shown herein, could also change the portion of the purchase consideration allocable to goodwill and could impact the operating results of TMC following the Business Combination due to differences in the allocation of the purchase consideration and in the depreciation and amortization related to some of these assets and liabilities. The unaudited pro forma combined financial information does not give effect to any anticipated synergies, operating efficiencies or cost savings that may be associated with the Business Combination. See "*Unaudited Pro Forma Combined Financial Information*."

Sponsor, as well as DeepGreen, our directors, executive officers, advisors and their affiliates may elect to purchase public shares prior to the consummation of the Business Combination, which may influence the vote on the Business Combination and reduce the public "float" of our Class A ordinary shares.

At any time at or prior to the Business Combination, during a period when they are not then aware of any material, nonpublic information regarding us or our securities, Sponsor, our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates may purchase public shares from institutional and other investors who vote, or indicate an intention to vote, against any of the Condition Precedent Proposals, or execute agreements to purchase such shares from such investors in the future, or they may enter into transactions with such investors and others to provide them with incentives to acquire public shares or vote their public shares in favor of the Condition Precedent Proposals. Such a purchase may include a contractual acknowledgement that such shareholder, although still the record or beneficial holder of our shares, is no longer the beneficial owner thereof and therefore agrees not to exercise its redemption rights. In the event that our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates purchase shares in privately negotiated transactions from public shareholders who have already elected to exercise their redemption rights, such selling shareholder would be required to revoke their prior elections to redeem their shares. The purpose of such share purchases and other transactions would be to increase the likelihood of satisfaction of the requirements that (i) the Continuance Proposal, the Business Combination Proposal, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal are approved by the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, and (ii) the Continuance Proposal and the Charter Proposal are approved by the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, or otherwise limit the number of public shares electing to redeem.

Entering into any such arrangements may have a depressive effect on the ordinary shares. For example, as a result of these arrangements, an investor or holder may have the ability to effectively purchase shares at a price lower than market and may therefore be more likely to sell the shares he or she owns, either at or prior to the Business Combination.

If such transactions are effected, the consequence could be to cause the Business Combination to be consummated in circumstances where such consummation could not otherwise occur. Purchases of shares by the persons described above would allow them to exert more influence over the approval of the proposals to be presented at the extraordinary general meeting and would likely increase the chances that such proposals would be approved.

In addition, if such purchases are made, the public "float" of our public shares and the number of beneficial holders of our securities may be reduced, possibly making it difficult to maintain or obtain the quotation, listing or trading of our securities on a national securities exchange.

If third parties bring claims against us, the proceeds held in the trust account could be reduced and the per share redemption amount received by shareholders may be less than $10.00 per share (which was the offering price in our initial public offering).

Our placing of funds in the trust account may not protect those funds from third-party claims against us. Although we will seek to have all vendors, service providers (other than our independent registered public accounting firm), prospective target businesses or other entities with which we do business execute agreements with us waiving any right, title, interest or claim of any kind in or to any monies held in the trust account, there is no guarantee that they will execute such agreements, or even if they execute such agreements that they would be prevented from bringing claims against the trust account, including, but not limited to, fraudulent inducement, breach of fiduciary responsibility or other similar claims, as well as claims challenging the enforceability of the waiver, in each case in order to gain advantage with respect to a claim against our assets, including the funds held in the trust account. If any third party refuses to execute an agreement waiving such claims to the monies held in the trust account, our management will perform an analysis of the alternatives available to it and will only enter into an agreement with a third party that has not executed a waiver if management believes that such third party's engagement would be significantly more beneficial to us than any alternative.

Examples of possible instances where we may engage a third party that refuses to execute a waiver include the engagement of a third party consultant whose particular expertise or skills are believed by management to be significantly superior to those of other consultants that would agree to execute a waiver or in cases where management is unable to find a service provider willing to execute a waiver. In addition, there is no guarantee that such entities will agree to waive any claims they may have in the future as a result of, or arising out of, any negotiations, contracts or agreements with us and will not seek recourse against the trust account for any reason. Upon redemption of our public shares, if we are unable to complete a business combination within the prescribed time frame, or upon the exercise of a redemption right in connection with our business combination, we will be required to provide for payment of claims of creditors that were not waived that may be brought against us within the ten years following redemption. Accordingly, the per share redemption amount received by public shareholders could be less than the $10.00 per share initially held in the trust account, due to claims of such creditors. In order to protect the amounts held in the trust account, Sponsor has agreed to be liable to us if and to the extent any claims by a vendor for services rendered or products sold to us, or a prospective target business with which we have discussed entering into a transaction agreement, reduces the amount of funds in the trust account. This liability will not apply with respect to any claims by a third party who executed a waiver of any right, title, interest or claim of any kind in or to any monies held in the trust account or to any claims under our indemnity of the underwriters of our initial public offering against certain liabilities, including liabilities under the Securities Act. Moreover, even in the event that an executed waiver is deemed to be unenforceable against a third party, Sponsor will not be responsible to the extent of any liability for such third party claims. We have not independently verified whether Sponsor has sufficient funds to satisfy its indemnity obligations and we have not asked Sponsor to reserve for such indemnification obligations. Therefore, we cannot assure you that Sponsor would be able to satisfy those obligations. None of our officers will indemnify us for claims by third parties including, without limitation, claims by vendors and prospective target businesses.

Additionally, if we are forced to file a bankruptcy case or an involuntary bankruptcy case is filed against us which is not dismissed, or if we otherwise enter compulsory or court supervised liquidation, the proceeds held in the trust account could be subject to applicable bankruptcy law, and may be included in our bankruptcy estate and subject to the claims of third parties with priority over the claims of our shareholders. To the extent any bankruptcy claims deplete the trust account, we may not be able to return to our public shareholders $10.00 per share (which was the offering price in our initial public offering).

If, after we distribute the proceeds in the trust account to our public shareholders, we file a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, a bankruptcy court may seek to recover such proceeds, and we and our board of directors may be exposed to claims of punitive damages.

If, after we distribute the proceeds in the trust account to our public shareholders, we file a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, any distributions received by shareholders could be viewed under applicable debtor/creditor and/or bankruptcy laws as either a "preferential transfer" or a "fraudulent conveyance." As a result, a bankruptcy court could seek to recover all amounts received by our shareholders. In addition, our board of directors may be viewed as having breached its fiduciary duty to our

creditors and/or having acted in bad faith, thereby exposing it and us to claims of punitive damages, by paying public shareholders from the trust account prior to addressing the claims of creditors. We cannot assure you that claims will not be brought against us for these reasons.

If, before distributing the proceeds in the trust account to our public shareholders, we file a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, the claims of creditors in such proceeding may have priority over the claims of our shareholders and the per share amount that would otherwise be received by our shareholders in connection with our liquidation may be reduced.

If, before distributing the proceeds in the trust account to our public shareholders, we file a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, the proceeds held in the trust account could be subject to applicable bankruptcy law, and may be included in our bankruptcy estate and subject to the claims of third parties with priority over the claims of our shareholders. To the extent any bankruptcy claims deplete the trust account, the per-share amount that would otherwise be received by our shareholders in connection with our liquidation may be reduced.

Our shareholders may be held liable for claims by third parties against us to the extent of distributions received by them upon redemption of their shares.

If we are forced to enter into an insolvent liquidation, any distributions received by shareholders could be viewed as an unlawful payment if it was proved that immediately following the date on which the distribution was made, we were unable to pay our debts as they fall due in the ordinary course of business. As a result, a liquidator could seek to recover all amounts received by our shareholders. Furthermore, our directors may be viewed as having breached their fiduciary duties to us or our creditors and/or may have acted in bad faith, and thereby exposing themselves and our company to claims, by paying public shareholders from the trust account prior to addressing the claims of creditors. Claims may be brought against us for these reasons.

We are an emerging growth company and a smaller reporting company within the meaning of the Securities Act, and if we take advantage of certain exemptions from disclosure requirements available to "emerging growth companies" or "smaller reporting companies," this could make our securities less attractive to investors and may make it more difficult to compare our performance with other public companies.

We are an "emerging growth company" within the meaning of the Securities Act, as modified by the JOBS Act, and we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, the reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and the exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. As a result, our shareholders may not have access to certain information they may deem important. We could be an emerging growth company for up to five years, although circumstances could cause us to lose that status earlier, including if the market value of our Class A ordinary shares held by non-affiliates exceeds $700 million as of any June 30 before that time, in which case we would no longer be an emerging growth company as of the following December 31. We cannot predict whether investors will find our securities less attractive because we will rely on these exemptions. If some investors find our securities less attractive as a result of our reliance on these exemptions, the trading prices of our securities may be lower than they otherwise would be, there may be a less active trading market for our securities and the trading prices of our securities may be more volatile.

Further, Section 102(b)(1) of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies (that is, those that have not had a Securities Act registration statement declared effective or do not have a class of securities registered under the Exchange Act) are required to comply with the new or revised financial accounting standards. The JOBS Act provides that a company can elect to opt out of the extended transition period and comply with the requirements that apply to non-emerging growth companies but any such an election to opt out is irrevocable. We have elected not to opt out of such extended transition period which means that when a standard is issued or revised and it has different application dates for public or private companies, we, as an emerging growth company, can adopt the new or revised standard at the time private companies adopt the new or revised standard. This may make comparison of our

financial statements with another public company which is neither an emerging growth company nor an emerging growth company which has opted out of using the extended transition period difficult or impossible because of the potential differences in accounting standards used.

Additionally, we are a "smaller reporting company" as defined in Item 10(f)(1) of Regulation S-K. Smaller reporting companies may take advantage of certain reduced disclosure obligations, including, among other things, providing only two years of audited financial statements. We will remain a smaller reporting company until the last day of any fiscal year for so long as either (1) the market value of our ordinary shares held by non-affiliates did not exceed $250 million as of the prior June 30, or (2) our annual revenues did not exceed $100 million during such completed fiscal year and the market value of our ordinary shares held by non-affiliates did not exceed $700 million as of the prior June 30.

Compliance obligations under the Sarbanes-Oxley Act may make it more difficult for us to effectuate the Business Combination, require substantial financial and management resources and increase the time and costs of completing a business combination.

The fact that we are a blank check company makes compliance with the requirements of the Sarbanes-Oxley Act particularly burdensome on us as compared to other public companies. DeepGreen is not a publicly reporting company required to comply with Section 404 of the Sarbanes-Oxley Act, and TMC management may not be able to effectively and timely implement controls and procedures that adequately respond to the increased regulatory compliance and reporting requirements that will be applicable to TMC after the Business Combination. If we are not able to implement the requirements of Section 404, including any additional requirements once we are no longer an emerging growth company, in a timely manner or with adequate compliance, we may not be able to assess whether its internal control over financial reporting are effective, which may subject us to adverse regulatory consequences and could harm investor confidence and the market price of TMC Common Shares. Additionally, once we are no longer an emerging growth company, we will be required to comply with the independent registered public accounting firm attestation requirement on our internal control over financial reporting.

The price of TMC Common Shares and TMC's warrants may be volatile.

Upon consummation of the Business Combination, the price of TMC Common Shares and TMC's warrants may fluctuate due to a variety of factors, including:

- changes in the industries in which TMC and its customers operate;
- variations in its operating performance and the performance of its competitors in general;
- material and adverse impact of the COVID-19 pandemic on the markets and the broader global economy;
- actual or anticipated fluctuations in TMC's quarterly or annual operating results;
- publication of research reports by securities analysts about TMC or its competitors or its industry;
- the public's reaction to TMC's press releases, its other public announcements and its filings with the SEC;
- TMC's failure or the failure of its competitors to meet analysts' projections or guidance that TMC or its competitors may give to the market;
- additions and departures of key personnel;
- changes in laws and regulations affecting its business;
- commencement of, or involvement in, litigation involving TMC;
- changes in TMC's capital structure, such as future issuances of securities or the incurrence of additional debt;

- the volume of TMC Common Shares available for public sale; and
- general economic and political conditions such as recessions, interest rates, fuel prices, foreign currency fluctuations, international tariffs, social, political and economic risks and acts of war or terrorism.

These market and industry factors may materially reduce the market price of TMC Common Shares and TMC's warrants regardless of the operating performance of TMC.

The public shareholders will experience immediate dilution as a consequence of the issuance of TMC Common Shares in connection with the Business Combination and the PIPE Financing.

In accordance with the terms and subject to the conditions of the Business Combination Agreement, at the Effective Time, (i) SOAC will acquire all of the issued and outstanding DeepGreen Common Shares, (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares or DeepGreen Options, as applicable, an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the effective time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, or, as applicable, options to purchase such TMC Common Shares and DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia.

The issuance of additional common shares will significantly dilute the equity interests of existing holders of SOAC securities, and may adversely affect prevailing market prices for the TMC Common Shares and/or the TMC warrants.

A significant portion of SOAC's total outstanding shares are restricted from immediate resale but may be sold into the market in the near future. This could cause the market price of the TMC Common Shares to drop significantly, even if TMC's business is doing well.

Sales of a substantial number of TMC Common Shares in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of the TMC Common Shares. Upon completion of the Business Combination, the initial shareholders will own approximately 2.3% of the outstanding TMC Common Shares, assuming no public shares are redeemed in connection with the Business Combination or approximately 2.5% of the outstanding TMC Common Shares assuming that all public shares are redeemed in connection with the Business Combination. In addition, certain Existing DeepGreen Securityholders that will be party to the Amended and Restated Registration Rights Agreement will own TMC Common Shares subject to lock-up restrictions representing approximately 49.7% of the outstanding TMC Common Shares, assuming no public shares are redeemed in connection with the Business Combination or approximately 55.4% of the outstanding TMC Common Shares assuming that all public shares are redeemed in connection with the Business Combination. While such Existing DeepGreen Security Holders and the initial shareholders will agree, and, in the case of the initial shareholders, will continue to be subject, to certain restrictions regarding the transfer of the TMC Common Shares, these shares may be sold after the expiration of the applicable lock-up restrictions. TMC may file one or more registration statements prior to or shortly after the Closing to provide for the resale of such shares from time to time. As restrictions on resale end and the registration statements are available for use, the market price of the TMC Common Shares could decline if the holders of currently restricted shares sell them or are perceived by the market as intending to sell them.

Warrants will become exercisable for TMC Common Shares upon the consummation of the Business Combination, which would increase the number of shares eligible for future resale in the public market and result in dilution to our shareholders.

If the Business Combination is completed, outstanding warrants to purchase an aggregate of 9,500,000 TMC Common Shares will become exercisable in accordance with the terms of the warrant agreement governing those securities. These warrants will become exercisable 30 days after the completion of the Business Combination. The exercise price of these warrants will be $11.50 per share. In addition, DeepGreen issued the Allseas Warrant to Allseas, which shall vest upon certain milestones into such number of shares that is based on the formula described therein, and which will become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination in accordance with its terms. To the extent any such warrants are exercised, additional TMC Common Shares will be issued, which will result in dilution to the holders of TMC Common Shares and increase the number of

shares eligible for resale in the public market. Sales of substantial numbers of such shares in the public market or the fact that such warrants may be exercised could adversely affect the market price of TMC Common Shares. However, there is no guarantee that the public warrants will ever be in the money prior to their expiration, and as such, the warrants may expire worthless. See "— *Even if the Business Combination is consummated, the public warrants may never be in the money, and they may expire worthless and the terms of the warrants may be amended in a manner adverse to a holder if holders of at least 50% of the then outstanding public warrants approve of such amendment.*"

We may redeem your unexpired warrants prior to their exercise at a time that is disadvantageous to you, thereby making your warrants worthless.

We have the ability to redeem outstanding warrants at any time after they become exercisable and prior to their expiration, at a price of $0.01 per warrant, *provided* that the closing price of our Class A ordinary shares equals or exceeds $18.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending on the third trading day prior to proper notice of such redemption and provided that certain other conditions are met. If and when the warrants become redeemable by us, we may exercise our redemption right even if we are unable to register or qualify the underlying securities for sale under all applicable state securities laws. Redemption of the outstanding warrants could force you to (i) exercise your warrants and pay the exercise price therefor at a time when it may be disadvantageous for you to do so, (ii) sell your warrants at the then-current market price when you might otherwise wish to hold your warrants or (iii) accept the nominal redemption price which, at the time the outstanding warrants are called for redemption, is likely to be substantially less than the market value of your warrants. None of the private placement warrants will be redeemable by us on such terms so long as they are held by Sponsor or its permitted transferees.

Our warrants are accounted for as liabilities and the changes in value of our warrants could have a material effect on our financial results.

On April 12, 2021, the Acting Director of the Division of Corporation Finance and Acting Chief Accountant of the SEC together issued a statement regarding the accounting and reporting considerations for warrants issued by special purpose acquisition companies entitled "Staff Statement on Accounting and Reporting Considerations for Warrants Issued by Special Purpose Acquisition Companies ('SPACs')" (the "SEC Statement"). Specifically, the SEC Statement focused on certain settlement terms and provisions related to certain tender offers following a business combination, which terms are similar to those contained in the warrant agreement governing our warrants. As a result of the SEC Statement, we reevaluated the accounting treatment of our 15,000,000 public warrants and 9,500,000 private placement warrants, and determined to classify the warrants as derivative liabilities measured at fair value, with changes in fair value each period reported in earnings. We expect that we will recognize non-cash gains or losses due to the quarterly fair valuation of our warrants and that such gains or losses could be material.

We have identified a material weakness in our internal control over financial reporting as of December 31, 2020. If we are unable to develop and maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results in a timely manner, which may adversely affect investor confidence in us and materially and adversely affect our business and operating results.

Following this issuance of the SEC Statement, after consultation with the Company's management and the audit committee of our Board of Directors (the "Audit Committee"), the Company concluded that, in light of the SEC Statement, it was appropriate to restate the Company's previously issued audited financial statements as of and for the year ended December 31, 2020. See "— *Our warrants are accounted for as liabilities and the changes in value of our warrants could have a material effect on our financial results*." As part of such process, we identified a material weakness in our internal controls over financial reporting.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented, or detected and corrected on a timely basis.

Effective internal controls are necessary for us to provide reliable financial reports and prevent fraud. We continue to evaluate steps to remediate the material weakness. These remediation measures may be time consuming and costly and there is no assurance that these initiatives will ultimately have the intended effects.

If we identify any new material weaknesses in the future, any such newly identified material weakness could limit our ability to prevent or detect a misstatement of our accounts or disclosures that could result in a material misstatement of our annual or interim financial statements. In such case, we may be unable to maintain compliance with securities law requirements regarding timely filing of periodic reports in addition to applicable stock exchange listing requirements, investors may lose confidence in our financial reporting and our stock price may decline as a result. We cannot assure you that the measures we have taken to date, or any measures we may take in the future, will be sufficient to avoid potential future material weaknesses.

We may face litigation and other risks and uncertainties as a result of the material weakness in our internal control over financial reporting and the restatement of our financial statements.

As a result of such material weakness, the restatement of our previously issued financials, the change in accounting for the warrants and other matters raised or that may in the future be raised by the SEC, we face potential for litigation, inquiries from the SEC and other regulatory bodies, other disputes or proceedings which may include, among other things, monetary judgments, penalties or other sanctions, claims invoking the federal and state securities laws and contractual claims. As of the date of this Annual Report, we have no knowledge of any such litigation, inquires, disputes or proceedings. However, we can provide no assurance that such litigation, inquiries, disputes or proceedings will not arise in the future. Any such litigation, inquiries, disputes or proceedings, whether successful or not, could have a material adverse effect on our business, results of operations and financial condition or our ability to complete our initial business combination.

Reports published by analysts, including projections in those reports that differ from our actual results, could adversely affect the price and trading volume of our common shares.

Securities research analysts may establish and publish their own periodic projections for TMC following consummation of the Business Combination. These projections may vary widely and may not accurately predict the results we actually achieve. Our share price may decline if our actual results do not match the projections of these securities research analysts. Similarly, if one or more of the analysts who write reports on us downgrades our shares or publishes inaccurate or unfavorable research about our business, our share price could decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, our share price or trading volume could decline. While we expect research analyst coverage following consummation of the Business Combination, if no analysts commence coverage of us, the market price and volume for our common shares could be adversely affected.

We are subject to and TMC will be subject to changing laws and regulations regarding regulatory matters, corporate governance and public disclosure that have increased both SOAC's costs and the risk of non-compliance and will increase both TMC's costs and the risk of non-compliance.

We are, and TMC will be, subject to rules and regulations by various governing bodies, including, for example, the SEC, which is charged with the protection of investors and the oversight of companies whose securities are publicly traded, and to new and evolving regulatory measures under applicable law. Our efforts to comply with new and changing laws and regulations have resulted in, and TMC's efforts to comply likely will result in, increased general and administrative expenses and a diversion of management time and attention from seeking a business combination target.

Moreover, because these laws, regulations and standards are subject to varying interpretations, their application in practice may evolve over time as new guidance becomes available. This evolution may result in continuing uncertainty regarding compliance matters and additional costs necessitated by ongoing revisions to TMC's disclosure and governance practices. If we fail to address and comply with these regulations and any subsequent changes, we may be subject to penalty and our business may be harmed.

Risks Related to the Consummation of the Continuance

Unless the context otherwise requires, any reference in this section of this proxy statement/prospectus to "we," "us" or "our" refers to SOAC prior to the Business Combination and to TMC and its subsidiaries following the Business Combination.

All holders are urged to consult their tax advisor for the tax consequences of the Continuance to their particular situation. For a more detailed description of the U.S. federal income tax consequences associated with the Continuance, see "*U.S. Federal Income Tax Considerations*."

Upon consummation of the Continuance, the rights of holders of TMC Common Shares arising under the BCBCA as well as TMC Notice and Articles will differ from and may be less favorable to the rights of holders of Class A ordinary shares arising under Cayman Islands law as well as our Existing Governing Documents.

Upon consummation of the Continuance, the rights of holders of TMC Common Shares will arise under the TMC Notice and Articles as well as the BCBCA. The TMC Notice and Articles and the BCBCA contain provisions that differ in some respects from those in the Existing Governing Documents and Cayman Islands law and, therefore, some rights of holders of TMC Common Shares could differ from the rights that holders of Class A ordinary shares currently possess. For instance, while class actions are generally not available to shareholders under Cayman Islands law, such actions are generally available under the BCBCA. This change could increase the likelihood that TMC becomes involved in costly litigation, which could have a material adverse effect on TMC.

In addition, there are differences between the TMC Notice and Articles and the Existing Governing Documents. For a more detailed description of the rights of holders of TMC Common Shares and how they may differ from the rights of holders of Class A ordinary shares, please see "*Comparison of Corporate Governance and Shareholder Rights*." The forms of the TMC Notice and Articles are attached as Annex B and Annex C, respectively, to this proxy statement/prospectus, and we urge you to read them.

Canadian law and TMC Notice and Articles contain certain provisions, including anti-takeover provisions, that limit the ability of shareholders to take certain actions and could delay or discourage takeover attempts that shareholders may consider favorable.

Provisions in the TMC Notice and Articles, as well as certain provisions under the BCBCA and applicable Canadian laws, may discourage, delay or prevent a merger, acquisition or other change in control of TMC that shareholders may consider favorable, including transactions in which they might otherwise receive a premium for their common shares.

For instance, the Notice and Articles will contain provisions that establish certain advance notice procedures for nomination of candidates for election as directors at shareholders' meetings. See "*Description of TMC Securities — Certain Important Provisions of TMC Notice and Articles and the BCBCA.*"

Limitations on the ability to acquire and hold TMC Common Shares may also be imposed by the *Competition Act* (Canada). This legislation permits the Commissioner of Competition, or Commissioner, to review any acquisition or establishment, directly or indirectly, including through the acquisition of shares, of control over or of a significant interest in TMC. Moreover, a non-Canadian must file an application for review with the Minister responsible for the *Investment Canada Act* and obtain approval of the Minister prior to acquiring control of a "Canadian business" within the meaning of the *Investment Canada Act*, where prescribed financial thresholds are exceeded.

Further, changes to critical minerals policies and regulations in Canada and the United States and elsewhere may impact the ability of TMC to conduct its businesses internationally, including processing and sales of minerals and metals, and the ability to negotiate or agree any merger, acquisition or change of control.

The TMC Notice and Articles will provide that any derivative actions, actions relating to breach of fiduciary duties and other matters relating to TMC's internal affairs will be required to be litigated in the Province of British Columbia, Canada, and will contain an exclusive federal forum provision for certain claims under the Securities Act, which could limit your ability to obtain a favorable judicial forum for disputes with TMC.

TMC Notice and Articles that will become effective immediately after the Continuance will include a forum selection provision that provides that, unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of British Columbia, Canada and the appellate courts therefrom, will be the sole and exclusive forum for (i) any derivative action or proceeding brought on TMC's behalf; (ii) any action or proceeding asserting a claim of breach of a fiduciary duty owed by any of TMC's directors, officers, or other employees to us; (iii) any action or proceeding asserting a claim arising pursuant to any provision of the BCBCA or TMC Notice and Articles (as either may be amended from time to time); or (iv) any action or proceeding asserting a claim otherwise related to the relationships among TMC, its affiliates and their respective shareholders, directors and/or officers, but excluding claims related to TMC's business or of such affiliates. The forum selection provision also provides that TMC's securityholders are deemed to have consented to personal jurisdiction in the Province of British Columbia and to service of process on their counsel in any foreign action initiated in violation of the foregoing provisions. The forum selection provision may impose additional litigation costs on securityholders in pursuing any such claims. This provision will not apply to suits brought to enforce any duty or liability created by the Securities Act or the Exchange Act, or the rules and regulations thereunder.

Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all claim brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder and TMC Notice and Articles will provide that the federal district courts of the United States of America will, to the fullest extent permitted by law, be the sole and exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act (the "Federal Forum Provision"). Application of the Federal Forum Provision means that suits brought by TMC's securityholders to enforce any duty or liability created by the Securities Act must be brought in federal court and cannot be brought in any state court.

Section 27 of the Exchange Act creates exclusive federal jurisdiction over all claims brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder. Accordingly, actions by TMC's shareholders to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder must be brought in federal court. TMC's shareholders will not be deemed to have waived TMC's compliance with the federal securities laws and the regulations promulgated thereunder.

Any person or entity purchasing or otherwise acquiring or holding any interest in any TMC securities shall be deemed to have notice of and consented to the aforementioned forum selection provisions, including the Federal Forum Provision. Additionally, TMC's securityholders cannot waive compliance with the federal securities laws and the rules and regulations thereunder. These provisions may limit TMC's securityholders' ability to bring a claim in a judicial forum they find favorable for disputes with TMC or its directors, officers, or other employees, which may discourage lawsuits against TMC and its directors, officers, and other employees. Alternatively, if a court were to find the choice of forum provision contained in TMC Notice and Articles to be inapplicable or unenforceable in an action, TMC may incur additional costs associated with resolving such action in other jurisdictions, which could harm TMC's business, operating results and financial condition. See "*Description of TMC Securities — Certain Important Provisions of TMC Notice and Articles and the BCBCA — Forum Selection*."

The TMC Notice and Articles will permit TMC to issue an unlimited number of TMC Common Shares and preferred shares without seeking approval of the holders of TMC Common Shares.

The TMC Notice and Articles will permit TMC to issue an unlimited number of TMC Common Shares. Subject to the requirements of the BCBCA and applicable securities exchange, TMC will not be required to obtain the approval of shareholders for the issuance of additional TMC Common Shares. Any further issuances of TMC Common Shares will result in immediate dilution to existing shareholders and may have an adverse effect on the value of their shareholdings.

The TMC Notice and Articles will also permit TMC to issue an unlimited number of preferred shares, issuable in series and, subject to the requirements of the BCBCA, having such designations, rights, privileges, restrictions and conditions, including dividend and voting rights, as the board of directors of TMC may determine and which may be superior to those of the TMC Common Shares. The issuance of preferred shares could, among other things, have the

effect of delaying, deferring or preventing a change in control of TMC and might adversely affect the market price of the TMC Common Shares. Subject to the provisions of the BCBCA and the NASDAQ, we will not be required to obtain the approval of the holders of TMC Common Shares for the issuance of preferred shares or to determine the maximum number of shares of each series of preferred shares, create an identifying name for each series and attach such special rights or restrictions as our board of directors may determine. See "*Description of TMC Securities — Authorized Share Capital — Preferred Shares*."

As a company incorporated in British Columbia with some of our directors and officers residing outside of the U.S., it may be difficult for investors in the United States to enforce civil liabilities against TMC based solely upon the federal securities laws of the United States.

Upon the Continuance, TMC will be incorporated under the laws of British Columbia with its registered office located in British Columbia, Canada. Most of TMC's directors and officers reside outside of the United States and all or a substantial portion of our assets and those of such persons are located outside the United States. Consequently, it may be difficult for U.S. investors to effect service of process within the United States upon TMC or its directors or officers who are not residents of the United States, or to realize in the United States upon judgments of courts of the United States predicated upon civil liabilities under the Securities Act. Investors should not assume that Canadian courts: (i) would enforce judgments of U.S. courts obtained in actions against TMC or such persons predicated upon the civil liability provisions of the U.S. federal securities laws or the securities or blue sky laws of any state within the United States or (ii) would enforce, in original actions, liabilities against TMC or such persons predicated upon the U.S. federal securities laws or any such state securities or blue sky laws.

Risks Related to the Redemption

Unless the context otherwise requires, any reference in this section of this proxy statement/prospectus to "we," "us" or "our" refers to SOAC prior to the Business Combination and to TMC and its subsidiaries following the Business Combination.

Public Shareholders who wish to redeem their public shares for a pro rata portion of the trust account must comply with specific requirements for redemption that may make it more difficult for them to exercise their redemption rights prior to the deadline. If shareholders fail to comply with the redemption requirements specified in this proxy statement/prospectus, they will not be entitled to redeem their public shares for a pro rata portion of the funds held in the trust account.

A public shareholder will be entitled to receive cash for any public shares to be redeemed only if such public shareholder: (i)(a) holds public shares, or (b) if the public shareholder holds public shares through units, the public shareholder elects to separate its units into the underlying public shares and public warrants prior to exercising its redemption rights with respect to the public shares; (ii) submits a written request to Continental in which it (a) requests that TMC redeem all or a portion of its public shares for cash, and (b) identifies itself as a beneficial holder of the public shares and provides its legal name, phone number and address and (iii) delivers its public shares to Continental, SOAC's transfer agent, physically or electronically through DTC. Holders must complete the procedures for electing to redeem their public shares in the manner described above prior to 5:00 p.m., Eastern Time, on , 2021 (two business days before the extraordinary general meeting) in order for their shares to be redeemed. In order to obtain a physical share certificate, a shareholder's broker and/or clearing broker, DTC and Continental, SOAC's transfer agent, will need to act to facilitate this request. It is SOAC's understanding that shareholders should generally allot at least two weeks to obtain physical certificates from the transfer agent. However, because SOAC does not have any control over this process or over DTC, it may take significantly longer than two weeks to obtain a physical share certificate. If it takes longer than anticipated to obtain a physical certificate, public shareholders who wish to redeem their public shares may be unable to obtain physical certificates by the deadline for exercising their redemption rights and thus will be unable to redeem their shares.

If the Business Combination is consummated, and if a public shareholder properly exercises its right to redeem all or a portion of the public shares that it holds and timely delivers its shares to Continental, SOAC's transfer agent, TMC will redeem such public shares for a per-share price, payable in cash, equal to the pro rata portion of the trust account established at the consummation of our initial public offering, calculated as of two business days prior to the consummation of the Business Combination. Please see the section entitled "*Extraordinary General Meeting of SOAC — Redemption Rights*" for additional information on how to exercise your redemption rights.

If a public shareholder fails to receive notice of SOAC's offer to redeem public shares in connection with the Business Combination, or fails to comply with the procedures for tendering its shares, such shares may not be redeemed.

If, despite SOAC's compliance with the proxy rules, a public shareholder fails to receive SOAC's proxy materials, such public shareholder may not become aware of the opportunity to redeem his, her or its public shares. In addition, the proxy materials that SOAC is furnishing to holders of public shares in connection with the Business Combination describes the various procedures that must be complied with in order to validly redeem the public shares. In the event that a public shareholder fails to comply with these procedures, its public shares may not be redeemed. Please see the section entitled "*Extraordinary General Meeting of SOAC — Redemption Rights*" for additional information on how to exercise your redemption rights.

SOAC does not have a specified maximum redemption threshold. The absence of such a redemption threshold may make it possible for us to complete the Business Combination with which a substantial majority of SOAC's shareholders do not agree.

The Existing Governing Documents do not provide a specified maximum redemption threshold, except that SOAC will not redeem public shares in an amount that would cause SOAC's net tangible assets to be less than $5,000,001 after giving effect to the transactions contemplated by the Business Combination Agreement and the PIPE Financing (as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act).

As a result, SOAC may be able to complete the Business Combination even though a substantial portion of public shareholders do not agree with the transaction and have redeemed their shares or have entered into privately negotiated agreements to sell their shares to Sponsor, directors or officers or their affiliates. As of the date of this proxy statement/prospectus, no agreements with respect to the private purchase of public shares by SOAC or the persons described above have been entered into with any such investor or holder. SOAC will file or submit a Current Report on Form 8-K to disclose any material arrangements entered into or significant purchases made by any of the aforementioned persons that would affect the vote on the proposals to be put to the extraordinary general meeting or the redemption threshold. Any such report will include descriptions of any arrangements entered into or significant purchases by any of the aforementioned persons.

If you or a "group" of shareholders of which you are a part are deemed to hold an aggregate of more than 15% of the public shares, you (or, if a member of such a group, all of the members of such group in the aggregate) will lose the ability to redeem all such shares in excess of 15% of the public shares.

A public shareholder, together with any of his, her or its affiliates or any other person with whom it is acting in concert or as a "group" (as defined under Section 13 of the Exchange Act), will be restricted from redeeming in the aggregate his, her or its shares or, if part of such a group, the group's shares, in excess of 15% of the public shares. In order to determine whether a shareholder is acting in concert or as a group with another shareholder, SOAC will require each public shareholder seeking to exercise redemption rights to certify to SOAC whether such shareholder is acting in concert or as a group with any other shareholder. Such certifications, together with other public information relating to share ownership available to SOAC at that time, such as Section 13D, Section 13G and Section 16 filings under the Exchange Act, will be the sole basis on which SOAC makes the above-referenced determination. Your inability to redeem any such excess shares will reduce your influence over SOAC's ability to consummate the Business Combination and you could suffer a material loss on your investment in SOAC if you sell such excess shares in open market transactions. Additionally, you will not receive redemption distributions with respect to such excess shares if SOAC consummates the Business Combination. As a result, you will continue to hold that number of shares aggregating to more than 15% of the public shares and, in order to dispose of such excess shares, would be required to sell your shares in open market transactions, potentially at a loss. SOAC cannot assure you that the value of such excess shares will appreciate over time following the Business Combination or that the market price of the public shares will exceed the per-share redemption price. Notwithstanding the foregoing, shareholders may challenge SOAC's determination as to whether a shareholder is acting in concert or as a group with another shareholder in a court of competent jurisdiction.

However, SOAC's shareholders' ability to vote all of their shares (including such excess shares) for or against the Business Combination is not restricted by this limitation on redemption.

There is no guarantee that a shareholder's decision whether to redeem its shares for a pro rata portion of the trust account will put the shareholder in a better future economic position.

SOAC can give no assurance as to the price at which a shareholder may be able to sell its public shares in the future following the completion of the Business Combination or any alternative business combination. Certain events following the consummation of any initial business combination, including the Business Combination, may cause an increase in SOAC share price, and may result in a lower value realized now than a shareholder of SOAC might realize in the future had the shareholder not redeemed its shares. Similarly, if a shareholder does not redeem its shares, the shareholder will bear the risk of ownership of the public shares after the consummation of any initial business combination, and there can be no assurance that a shareholder can sell its shares in the future for a greater amount than the redemption price set forth in this proxy statement/prospectus. A shareholder should consult the shareholder's own financial advisor for assistance on how this may affect his, her or its individual situation.

Risks if the Adjournment Proposal is Not Approved

If the Adjournment Proposal is not approved, and an insufficient number of votes have been obtained to authorize the consummation of the Business Combination and the Continuance, the SOAC Board will not have the ability to adjourn the extraordinary general meeting to a later date in order to solicit further votes, and, therefore, the Business Combination will not be approved, and, therefore, the Business Combination may not be consummated.

The SOAC Board is seeking approval to adjourn the extraordinary general meeting to a later date or dates if, at the extraordinary general meeting, based upon the tabulated votes, there are insufficient votes to approve each of the Condition Precedent Proposals. If the Adjournment Proposal is not approved, the SOAC Board will not have the ability to adjourn the extraordinary general meeting to a later date and, therefore, will not have more time to solicit votes to approve the Condition Precedent Proposals. In such events, the Business Combination would not be completed.

Risks if the Continuance and the Business Combination are Not Consummated

References in this section to "we," "us" and "our" refer to SOAC.

If we are not able to complete the Business Combination with DeepGreen nor able to complete another business combination by November 8, 2021, in each case, as such date may be extended pursuant to our Existing Governing Documents, we would cease all operations except for the purpose of winding up and we would redeem our Class A ordinary shares and liquidate the trust account, in which case our public shareholders may only receive approximately $10.00 per share and our warrants will expire worthless.

If we are not able to complete the Business Combination with DeepGreen nor able to complete another business combination by November 8, 2021, in each case, as such date may be extended pursuant to our Existing Governing Documents we will: (i) cease all operations except for the purpose of winding up; (ii) as promptly as reasonably possible but not more than ten business days thereafter, redeem the public shares, at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the trust account, including interest (which interest will be net of taxes payable, and less up to $100,000 of interest to pay dissolution expenses), divided by the number of then outstanding public shares, which redemption will completely extinguish public shareholders' rights as shareholders (including the right to receive further liquidating distributions, if any), subject to applicable law; and (iii) as promptly as reasonably possible following such redemption, subject to the approval of our remaining shareholders and our board of directors, liquidate and dissolve, subject in each case to our obligations under Cayman Islands law to provide for claims of creditors and the requirements of other applicable law. In such case, our public shareholders may only receive approximately $10.00 per share and our warrants will expire worthless.

You will not have any rights or interests in funds from the trust account, except under certain limited circumstances. To liquidate your investment, therefore, you may be forced to sell your public shares or public warrants, potentially at a loss.

Our public shareholders will be entitled to receive funds from the trust account only upon the earlier to occur of: (i) the completion of a business combination (including the closing of the Business Combination), and then only in connection with those Class A ordinary shares that such shareholder properly elected to redeem, subject to the limitations described herein; (ii) the redemption of any public shares properly tendered in connection with a shareholder vote to amend the Existing Governing Documents (a) to modify the substance or timing of our obligation to provide holders of our Class A ordinary shares the right to have their shares redeemed in connection with a business combination or to redeem 100% of our public shares if we do not complete our initial business combination by November 8, 2021 or (b) with respect to any other provision relating to the rights of holders of our Class A ordinary shares; and (iii) the redemption of our public shares if we have not consummated an initial business by November 8, 2021, subject to applicable law and as further described herein. Public shareholders who redeem their public shares in connection with a shareholder vote described in clause (ii) in the preceding sentence will not be entitled to funds from the trust account upon the subsequent completion of an initial business combination or liquidation if we have not consummated an initial business combination by November 8, 2021, with respect to such public shares so redeemed. In no other circumstances will a shareholder have any right or interest of any kind to or in the trust account. Holders of warrants will not have any right to the proceeds held in the trust account with respect to the warrants. Accordingly, to liquidate your investment, you may be forced to sell your public shares or warrants, potentially at a loss.

If we do not consummate an initial business combination by November 8, 2021, our public shareholders may be forced to wait until after November 8, 2021 before redemption from the trust account.

If we are unable to consummate our initial business combination by November 8, 2021 (as such date may be extended pursuant to our Existing Governing Documents), we will distribute the aggregate amount then on deposit in the trust account, including interest earned on the funds held in the trust account and not previously released to us to pay our income taxes, if any (less up to $100,000 of the net interest earned thereon to pay dissolution expenses), pro rata to our public shareholders by way of redemption and cease all operations except for the purposes of winding up of our affairs, as further described in this proxy statement/prospectus. Any redemption of public shareholders from the trust account shall be affected automatically by function of the Existing Governing Documents prior to any voluntary winding up. If we are required to wind-up, liquidate the trust account and distribute such amount therein, pro rata, to our public shareholders, as part of any liquidation process, such winding up, liquidation and distribution must comply with Cayman Islands law. In that case, investors may be forced to wait beyond November 8, 2021 (as such date may be extended pursuant to our Existing Governing Documents), before the redemption proceeds of the trust account become available to them and they receive the return of their pro rata portion of the proceeds from the trust account. We have no obligation to return funds to investors prior to the date of our redemption or liquidation unless, prior thereto, we consummate our initial business combination or amend certain provisions of our Existing Governing Documents, and only then in cases where investors have sought to redeem their public shares. Only upon our redemption or any liquidation will public shareholders be entitled to distributions if we do not complete our initial business combination and do not amend our Existing Governing Documents. Our Existing Governing Documents provide that, if we wind up for any other reason prior to the consummation of our initial business combination, we will follow the foregoing procedures with respect to the liquidation of the trust account as promptly as reasonably possible but not more than ten business days thereafter, subject to applicable Cayman Islands law.

If the net proceeds of our initial public offering not being held in the trust account are insufficient to allow us to operate through November 8, 2021, and we are unable to obtain additional capital, we may be unable to complete our initial business combination, in which case our public shareholders may only receive $10.00 per share, and our warrants will expire worthless.

As of March 31, 2021, we had cash of approximately $1.2 million held outside the trust account, which is available for use by us to cover the costs associated with identifying a target business and negotiating a business combination and other general corporate uses. In addition, as of March 31, 2021, we had total current liabilities of approximately $4,756,519. The funds available to us outside of the trust account may not be sufficient to allow us to operate until November 8, 2021, assuming that our initial business combination is not completed during that time. Of the funds available to us, we could use a portion of the funds available to us to pay fees to consultants to assist

us with our search for a target business. We could also use a portion of the funds as a down payment or to fund a "no-shop" provision (a provision in letters of intent designed to keep target businesses from "shopping" around for transactions with other companies on terms more favorable to such target businesses) with respect to a particular proposed business combination, although we do not have any current intention to do so. If we entered into a letter of intent where we paid for the right to receive exclusivity from a target business and were subsequently required to forfeit such funds (whether as a result of our breach or otherwise), we might not have sufficient funds to continue searching for, or conduct due diligence with respect to, a target business.

If we are required to seek additional capital, we would need to borrow funds from Sponsor, members of our management team or other third parties to operate or may be forced to liquidate. Any such advances would be repaid only from funds held outside the trust account or from funds released to us upon completion of our initial business combination. If we are unable to obtain additional financing, we may be unable to complete our initial business combination. If we are unable to complete our initial business combination because we do not have sufficient funds available to us, we will be forced to cease operations and liquidate the trust account. Consequently, our public shareholders may only receive approximately $10.00 per share on our redemption of the public shares and the public warrants will expire worthless.

UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL INFORMATION

The following unaudited pro forma condensed combined balance sheet of TMC as of March 31, 2021 and the unaudited pro forma condensed combined statement of operations of TMC for the three months ended March 31, 2021 and the year ended December 31, 2020 present the combination of the financial information of SOAC and DeepGreen after giving effect to the Business Combination, PIPE Financing and related adjustments described in the accompanying notes. SOAC and DeepGreen are collectively referred to herein as the "Companies," and the Companies, subsequent to the Business Combination and the PIPE Financing, are referred to herein as "TMC."

The unaudited pro forma condensed combined statement of operations for the three months ended March 31, 2021 and for the year ended December 31, 2020 give pro forma effect to the Business Combination and PIPE Financing as if they had occurred on January 1, 2020. The unaudited pro forma condensed combined balance sheet as of March 31, 2021 gives pro forma effect to the Business Combination and PIPE Financing as if they were completed on March 31, 2021.

The unaudited pro forma condensed combined financial information is based on and should be read in conjunction with the audited historical financial statements of each of SOAC and DeepGreen and the notes thereto, as well as the disclosures contained in the sections titled "SOAC's Management's Discussion and Analysis of Financial Condition and Results of Operations" and "DeepGreen's Management's Discussion and Analysis of Financial Condition and Results of Operations," contained elsewhere in this proxy statement/prospectus.

The unaudited pro forma condensed combined financial information has been presented for illustrative purposes only and does not necessarily reflect what TMC's financial condition or results of operations would have been had the Business Combination and PIPE Financing occurred on the dates indicated. Further, the unaudited pro forma condensed combined financial information also may not be useful in predicting the future financial condition and results of operations of TMC. The actual financial position and results of operations may differ significantly from the pro forma amounts reflected herein due to a variety of factors. The unaudited pro forma adjustments represent management's estimates based on information available as of the date of this proxy statement/prospectus and are subject to change as additional information becomes available and analyses are performed.

On March 4, 2021, SOAC entered into the Business Combination Agreement with DeepGreen. SOAC will change its jurisdiction of incorporation by deregistering as an exempted company in the Cayman Islands and continuing as a company under the laws of British Columbia, Canada, upon which SOAC will change its name to "TMC the metal company Inc." On the Closing Date, promptly following the Continuance, pursuant to the Arrangement, (i) SOAC will acquire all of the issued and outstanding DeepGreen Common Shares, (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares or DeepGreen Options, as applicable, an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the Effective Time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, or, as applicable, options to purchase such TMC Common Shares and DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia. In addition, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms. "Adjusted Equity Value" under the Business Combination Agreement means the sum of (a) the Equity Value of $2.25 billion plus (b) the Aggregate Company Option Exercise Price (the aggregate exercise price that would be paid to DeepGreen in respect of all DeepGreen Options (whether vested or unvested) if such DeepGreen Options were exercised in full immediately prior to the Effective Time), plus (c) Net Group Company Cash (as defined in the Business Combination Agreement) immediately prior to the closing of the Business Combination. We have assumed $25 million of Net Group Company Cash at closing of the Business Combination, which would result in an approximately $2.3 billion Adjusted Equity Value and the issuance of 230.6 million TMC Common Shares to Existing DeepGreen Shareholders.

The unaudited pro forma condensed combined information contained herein assumes that the SOAC's shareholders approve the Business Combination. SOAC's public shareholders may elect to redeem their public shares for cash even if they approve the Business Combination. SOAC cannot predict how many of its public shareholders will exercise their right to have their Class A ordinary shares redeemed for cash. As a result, SOAC has elected to provide the unaudited pro forma condensed combined financial information under two different redemption scenarios, which produce different allocations of total TMC equity between holders of the ordinary shares. As

described in greater detail in Note 1, Basis of Pro Forma Presentation, of the unaudited pro forma condensed combined financial statements, the first scenario, or "no redemption scenario," assumes that none of SOAC's public shareholders will exercise their right to have their SOAC public shares redeemed for cash, and the second scenario, or "maximum redemption scenario," assumes that holders of the maximum number of public shares that could be redeemed for cash while still leaving sufficient cash available to consummate the Business Combination will exercise their right to have their public shares redeemed for cash. The actual results will be within the parameters described by the two scenarios. However, there can be no assurances regarding which scenario will be closest to the actual results. Under both scenarios, DeepGreen is considered the accounting acquirer, as further discussed in Note 1, Basis of Pro Forma Presentation, of the unaudited pro forma condensed combined financial statements.

The historical financial information of SOAC and DeepGreen has been adjusted in the unaudited pro forma condensed combined financial information to give effect to events that are (1) directly attributable to the Business Combination and the PIPE Financing and (2) factually supportable. The pro forma adjustments are prepared to illustrate the estimated effect of the Business Combination and the PIPE Financing and certain other adjustments.

The Business Combination will be accounted for as a reverse recapitalization because DeepGreen has been determined to be the accounting acquirer under Financial Accounting Standards Board's Accounting Standards Codification Topic 805, Business Combinations ("ASC 805") under both the no redemption and maximum redemption scenarios. The determination is primarily based on the evaluation of the following facts and circumstances taking into consideration both the no redemption and maximum redemption scenario:

- the pre-combination equityholders of DeepGreen will hold the majority of voting rights in TMC;
- the pre-combination equityholders of DeepGreen will have the right to appoint the majority of the directors on the TMC Board;
- the senior management of DeepGreen will comprise the senior management of TMC; and
- the operations of DeepGreen will comprise the ongoing operations of TMC.

Under the reverse recapitalization model, the Business Combination will be treated as DeepGreen issuing equity for the net assets of SOAC, with no goodwill or intangible assets recorded.

The unaudited pro forma condensed combined financial information has been prepared using the assumptions below with respect to the potential redemption of SOAC's Class A ordinary shares into cash:

- **Assuming No Redemptions:** This presentation assumes that no SOAC shareholders exercise redemption rights with respect to their public shares.
- **Assuming Maximum Redemptions:** This presentation assumes that all of SOAC's public shareholders exercise redemption rights with respect to their Class A ordinary shares. This scenario assumes that 30,000,000 Class A ordinary shares are redeemed for an aggregate redemption payment of approximately $300.1 million. This maximum redemption scenario is based on the maximum number of redemptions which may occur but which would still provide the minimum aggregate Business Combination and PIPE Financing proceeds of $250.0 million, consisting of SOAC trust account funds and PIPE Financing proceeds less SOAC's unpaid expenses, to be delivered at Closing of the Business Combination and the PIPE Financing.

If the actual facts are different than these assumptions, then the amounts and shares outstanding in the unaudited pro forma condensed combined financial information will be different.

The unaudited pro forma condensed combined financial information does not reflect the income tax effects of the pro forma adjustments as any change in the deferred tax balance would be offset by an increase in the valuation allowance given that DeepGreen incurred significant losses during the historical periods presented.

The following summarizes the pro forma TMC Common Shares outstanding under the no redemption and maximum redemption scenarios:

	Assuming No Redemption		Assuming Maximum Redemption	
	Shares	**%**	**Shares**	**%**
SOAC Public Shareholders	30,000,000	10.0%	—	0.0%
SOAC Initial Shareholders	6,759,000	2.3%	6,759,000	2.5%
Total SOAC	**36,759,000**	**12.3%**	**6,759,000**	**2.5%**
DeepGreen Shareholders and Optionholders (assuming exercise of options)	230,559,305	76.7%	230,559,305	85.3%
PIPE Investor(s)	33,030,000	11.0%	33,030,000	12.2%
Total Shares at Closing	**300,348,305**	**100.0%**	**270,348,305**	**100.0%**

The following unaudited pro forma condensed combined balance sheet as of March 31, 2021 and the unaudited pro forma condensed combined statements of operations for the three months ended March 31, 2021 and the year ended December 31, 2020 are based on the historical financial statements of SOAC and DeepGreen. The unaudited pro forma adjustments are based on information currently available, and assumptions and estimates underlying the unaudited pro forma adjustments are described in the accompanying notes. Actual results may differ materially from the assumptions used to present the accompanying unaudited pro forma condensed combined financial information.

UNAUDITED PRO FORMA CONDENSED COMBINED BALANCE SHEET
As of March 31, 2021
(Amounts in thousands of dollars, except per share data)

	SOAC (Historical)	DeepGreen Metals (Historical)	Pro Forma Transaction Adjustments (Assuming No Redemption)	Note	Combined Pro Forma (Assuming No Redemption)	Additional Pro Forma Transaction Adjustments (Assuming Max Redemption)		Combined Pro Forma (Assuming Max Redemption)
ASSETS								
Current								
Cash and equivalents	$ 1,169,714	$ 25,224,404	$ 300,073,644	**2a**	$ 585,068,803	$ (300,073,644)	**2m**	$ 284,995,159
	—	—	330,300,000	**2b**	—	—		—
	—	—	(71,698,959)	**2g**	—	—		—
Receivable and prepayments	199,999	120,697	—		320,696	—		320,696
Total current	1,369,713	25,345,101	558,674,685		585,389,499	(300,073,644)		285,315,855
Non-current								
Exploration licenses	—	43,150,319	—		43,150,319	—		43,150,319
Equipment	—	1,211,451	—		1,211,451	—		1,211,451
Operating lease right-of-use assets	—	—	—		—	—		—
Investments and cash held in Trust Account	300,073,644	—	(300,073,644)	**2a**	—	—		—
Total non-current	300,073,644	44,361,770	(300,073,644)		44,361,770	—		44,361,770
TOTAL ASSETS	$ 301,443,357	$ 69,706,871	$ 258,601,041		$ 629,751,269	$ (300,073,644)		$ 329,677,625
LIABILITIES								
Current								
Accounts payable and accrued liabilities	$ 4,756,519	$ 6,429,351	$ —		$ 11,185,870	$ —		$ 11,185,870
Deferred acquisition costs	—	1,250,000	—		1,250,000	—		1,250,000
Allseas milestone payments	—	—	8,181,230	**2k**	8,181,230	—		8,181,230
Warrant liability	22,050,000	—	(13,500,000)	**2l**	8,550,000	—		8,550,000
Deferred underwriter compensation	10,500,000	—	(10,500,000)	**2g**	—	—		—
Total current	37,306,519	7,679,351	(15,818,770)		29,167,100	—		29,167,100
Non-Current								
Convertible debentures	—	25,720,452	(25,720,452)	**2j**	—	—		—
Deferred tax liability	—	10,675,366	—		10,675,366	—		10,675,366
Total Non-current liabilities	—	36,395,818	(25,720,452)		10,675,366	—		10,675,366
Total liabilities	37,306,519	44,075,169	(41,539,222)		39,842,466	—		39,842,466
COMMITMENTS								
Class A ordinary shares, $0.0001 par value; 30,000,000 shares subject to possible redemption at $10.00 per share at March 31, 2021	300,073,645	—	(300,073,645)	**2c**	—	—		—
EQUITY								
Common shares (unlimited shares, no par value – issued: 169,230,402	—	183,137,353	(183,137,353)	**2i**	—	—		—
Preferred shares (unlimited share, no par value – issued: 550,000	—	550,000	(550,000)	**2i**	—	—		—
Common shares to be issued	—	—	—	**2i**	—	—		—
Reserves – Other	—	—	—	**2i**	—	—		—
Reserves – Options	—	—	—	**2i**	—	—		—
Preference shares, $0.0001 par value; 1,000,000 shares authorized; none issued and outstanding	—	—	—		—	—		—
Class A ordinary shares, $0.0001 par value; 300,000,000 shares authorized; -0- shares issued and outstanding (excluding 30,000,000 shares subject to possible redemption) at March 31, 2021 a	—	—	30,035	**2b, 2c, 2e, 2h**	30,035	(3,000)	**2m**	27,035

UNAUDITED PRO FORMA CONDENSED COMBINED BALANCE SHEET
As of March 31, 2021 — (Continued)
(Amounts in thousands of dollars, except per share data)

	SOAC (Historical)	DeepGreen Metals (Historical)	Pro Forma Transaction Adjustments (Assuming No Redemption)	Note	Combined Pro Forma (Assuming No Redemption)	Additional Pro Forma Transaction Adjustments (Assuming Max Redemption)		Combined Pro Forma (Assuming Max Redemption)
Class B ordinary shares, $0.0001 par value; 30,000,000 shares authorized; 7,500,000 shares issued and outstanding at March 31, 2021	750	—	(750)	**2e**	—	—		—
Class A Special Shares, no par value; 5,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class B Special Shares, no par value; 10,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class C Special Shares, no par value; 10,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class D Special Shares, no par value; 20,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class E Special Shares, no par value; 20,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class F Special Shares, no par value; 20,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class G Special Shares, no par value; 25,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class H Special Shares, no par value; 25,000,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class I Special Shares, no par value; 500,000 issued and outstanding	—	—	—	**2f**	—	—		—
Class J Special Shares, no par value; 741,000 issued and outstanding	—	—	—	**2f**	—	—		—
Additional paid-in capital	—	63,576,426	330,296,697	**2b**	819,692,075	(300,070,644)	**2m**	519,621,431
			300,070,645	**2c**				
			(35,937,557)	**2d**				
			74	**2e**				
			(61,198,959)	**2g**				
			(23,056)	**2h**				
			183,687,353	**2i**				
			25,720,452	**2j**				
			13,500,000	**2l**				
Accumulated Other Comprehensive Loss	—	(1,215,660)	—		(1,215,660)	—		(1,215,660)
Deficit	(35,937,557)	(220,416,417)	35,937,557	**2d**	(228,597,647)	—		(228,597,647)
			(8,181,230)	**2k**				
TOTAL EQUITY	(35,936,807)	25,631,702	600,213,908		589,908,803	(300,073,644)		289,835,159
TOTAL LIABILITIES AND EQUITY	$ 301,443,357	$ 69,706,871	$ 258,601,041		$ 629,751,269	$ (300,073,644)		$ 329,677,625

UNAUDITED PRO FORMA CONDENSED COMBINED STATEMENT OF OPERATIONS
For the three months ended March 31, 2021
(Amounts in thousands of dollars, except per share data)

	SOAC (Historical)	DeepGreen Metals (Historical)	Pro Forma Adjustments (Assuming No Redemption)	Note	Combined Pro Forma (Assuming No Redemption)	Additional Pro Forma Adjustments (Assuming Max Redemption)	Combined Pro Forma (Assuming Max Redemption)
General and administrative Expenses	$ 3,014,922	$ —	$ —		$ 3,014,922	$ —	$ 3,014,922
Exploration and evaluation expenditures	—	39,364,151	—		39,364,151	—	39,364,151
Allseas milestone and expense	—	—	1,165,049	**3b**	1,165,049	—	1,165,049
Consulting fees	—	638,776	—		638,776	—	638,776
Investor relations	—	1,129,646	—		1,129,646	—	1,129,646
Office and sundry	—	96,260	—		96,260	—	96,260
Professional fees	—	2,821,888	—		2,821,888	—	2,821,888
Salaries and wages	—	277,499	—		277,499	—	277,499
Director fees	—	48,784	—		48,784	—	48,784
Common Share options-based payments	—	12,878,985	—		12,878,985	—	12,878,985
Transfer agent and filing fees	—	3,764	—		3,764	—	3,764
Travel	—	59,408	—		59,408	—	59,408
Other items	3,014,922	57,319,161	1,165,049		61,499,132	—	61,499,132
Foreign exchange loss	—	18,606	—		18,606	—	18,606
Change in fair value of warrant liability	(34,880,000)	—	20,250,000	**3d**	(14,630,000)	—	(14,630,000)
Interest expense	—	220,452	(220,452)	**3c**	—	—	—
Gain / Interest income	(4,542)	—	4,542	**3a**	—	—	—
(Income) loss for the year	$ (31,869,620)	$ 57,558,219	$ 21,199,139		$ 46,887,738	$ —	$ 46,887,738
Other comprehensive income to be reclassified to profit and loss in subsequent periods							
Currency translation differences	—	1	—		1	—	1
Comprehensive (income) loss for the year	$ (31,869,620)	$ 57,558,220	$ 21,199,139		$ 46,887,739	$ —	$ 46,887,739
(Income) loss per share							
– Basic and diluted	$ (2.53)	$ 0.35	—		$ 0.16	—	$ 0.17
Weighted Average Number of Common Shares Outstanding	12,591,295	166,149,715	—		300,348,305	—	270,348,305

UNAUDITED PRO FORMA CONDENSED COMBINED STATEMENT OF OPERATIONS
For the year ended December 31, 2020
(Amounts in thousands dollars, except per share data)

	SOAC (Historical)	DeepGreen Metals (Historical)	Pro Forma Adjustments (Assuming No Redemption)	Note	Combined Pro Forma (Assuming No Redemption)	Additional Pro Forma Adjustments (Assuming Max Redemption)	Combined Pro Forma (Assuming Max Redemption)
General and administrative Expenses	$ 3,003,654	$ —	$ —		$ 3,003,654	$ —	$ 3,003,654
Exploration and evaluation expenditures	—	48,881,445	—		48,881,445	—	48,881,445
Allseas milestone and expense	—	—	7,016,181	**3b**	7,016,181	—	7,016,181
Consulting fees	—	1,385,882	—		1,385,882	—	1,385,882
Investor relations	—	857,810	—		857,810	—	857,810
Office and sundry	—	303,006	—		303,006	—	303,006
Professional fees	—	663,293	—		663,293	—	663,293
Salaries and wages	—	915,855	—		915,855	—	915,855
Director fees	—	195,101	—		195,101	—	195,101
Common Share options-based payments	—	3,263,131	—		3,263,131	—	3,263,131
Transfer agent and filing fees	—	6,023	—		6,023	—	6,023
Travel	—	132,821	—		132,821	—	132,821
Other items	3,003,654	56,604,367	7,016,181		66,624,202	—	66,624,202
Foreign exchange loss	—	80,447	—		80,447	—	80,447
Change in fair value of warrant liability	32,730,000	—	(19,050,000)	**3d**	13,680,000	—	13,680,000
Offering costs allocated to derivative warrant liabilities	877,647	—	—		877,647	—	877,647
Gain / Interest income	(69,246)	(53,435)	69,246	**3a**	(53,435)	—	(53,435)
Loss for the year	$ 36,542,055	$ 56,631,379	$ (11,964,573)		$ 81,208,861	$ —	$ 81,208,861
Other comprehensive income to be reclassified to profit and loss in subsequent periods							
Currency translation differences	—	125	—		125	—	125
Comprehensive loss for the year	$ 36,542,055	$ 56,631,504	$ (11,964,573)		$ 81,208,986	$ —	$ 81,208,986
Loss per share							
– Basic and diluted	$ 3.50	$ 0.37			$ 0.27		$ 0.30
Weighted Average Number of Common Shares Outstanding	10,464,651	154,224,664			300,348,305		270,348,305

Note 1. Basis of Pro Forma Presentation

The historical consolidated financial statements have been adjusted in the unaudited pro forma condensed combined financial statements to give effect to pro forma events that are described elsewhere in this proxy statement/prospectus and are directly attributable to the Business Combination and factually supportable.

The unaudited pro forma condensed combined financial statements have been prepared for illustrative purposes only and are not necessarily indicative of what the actual results of operations and financial position would have been had the Business Combination and related transactions taken place on the dates indicated, nor do they purport to project the future consolidated results of operations or financial position of the combined company. They should be read in conjunction with the unaudited and audited consolidated financial statements and notes thereto of each of SOAC and DeepGreen as at and for the three months ended March 31, 2021 and the year ended December 31, 2020, respectively and included elsewhere in this proxy statement/prospectus.

There were no significant intercompany balances or transactions between SOAC and DeepGreen as of the date and for the periods of these unaudited pro forma condensed combined financial statements.

DeepGreen is currently negotiating certain employment agreements for the post-closing entity. Based on the preliminary terms, these agreements would result in an increase in compensation cost on a pro forma basis. However, as these employment agreements are preliminary and not yet executed, SOAC has not included a pro forma adjustment because such amounts are not known and are deemed not factually supportable at this time.

The pro forma basic and diluted earnings per share amounts presented in the unaudited pro forma condensed combined statements of operations are based upon the number of SOAC's ordinary shares outstanding, assuming the Business Combination and related transactions occurred on January 1, 2020.

Note 2. Unaudited Pro Forma Condensed Combined Balance Sheet Adjustments

The pro forma adjustments included in the unaudited pro forma condensed combined balance sheet as of March 31, 2021 are as follows:

a) Reflects the reclassification of $300.1 million of cash and cash equivalents held in SOAC's trust account that becomes available for transaction expenses, redemption of public shares and the operating activities following the Business Combination assuming no redemptions.

b) Reflects the gross cash proceeds from the PIPE Financing of 33.0 million TMC Common Shares for $330.3 million from PIPE Investors.

c) Represents the reclassification of $300.1 million of ordinary shares subject to possible redemption to permanent equity assuming no redemptions.

d) Reflects the elimination of SOAC's historical retained earnings.

e) Reflects the reclassification of SOAC Class B ordinary shares. 6.8 million Class B ordinary shares will be converted on a one-for-one basis to TMC Common Shares, 0.7 million Class B common shares will be converted to Class J Special Shares and 0.5 million Class I Special Shares, all of which will be issued to the Sponsor group as part of the Business Combination.

f) Reflects the issuance of 135 million DeepGreen Earnout Shares (Class A through Class H) issued to DeepGreen Shareholders and holders of DeepGreen Options upon the exercise of such DeepGreen Options, as additional consideration for the Business Combination, which will automatically convert in accordance with their terms based on certain TMC Common Share price thresholds.

g) Reflects the payment of SOAC and DeepGreen transaction costs of $71.7 million, expected to be incurred related to the closing of the Business Combination. Of that amount, $10.5 million relates to the cash settlement of deferred underwriter compensation incurred as part of SOAC's IPO to be paid upon the consummation of a Business Combination. The remaining transaction costs of $61.2 million include direct and incremental costs, such as legal, third party advisory, investment banking, other miscellaneous fees and equity financing fees associated with the PIPE Financing described at Note 2(b). Transaction costs previously incurred that are not direct and incremental to the transaction have been included within the historical statement of operations of DeepGreen and SOAC.

h) Reflects the issuance of 230.0 million TMC Common Shares to DeepGreen Securityholders at $0.0001 par value as consideration for the Business Combination.

i) Reflects the recapitalization of DeepGreen, including the reclassification of historical equity to TMC Common Shares and Additional Paid in Capital.

j) Reflects the conversion of DeepGreen's convertible debentures into DeepGreen Common Shares immediately prior to the Business Combination which would then be reflected in equity.

k) Reflects the impact of the Third Amendment to the Pilot Mining Test Agreement ("PMTA") executed on March 4, 2021. This agreement becomes effective upon the successful completion of the Business Combination and amends previous terms to the Second Amendment to the PMTA. Amount other things, this amendment issues up to 10 million warrants of DeepGreen which will then apply the exchange ratio similar to other DeepGreen Common Shares and allows for three potential milestone payments of $10 million each. The adjustment reflects the accumulated amortization form the beginning of the first amendment as the payments are for R&D related services being evaluated in accordance with ASC 730. The third milestone liability is not determined to be probable at the time of the Business Combination in accordance with ASC 450. The warrants are contingent upon a successful completion of the PMTA as defined therein and will be accounted for under ASC 718 as share based compensation for goods and services with a performance condition. The performance condition is not determined to be probable at the time of the Business Combination and therefore, no adjustment has been reflected related to the warrants. Refer to Note 3(b) for discussion of the impact to the statement of operations associated with this amendment.

l) Reflects the reclassification of the public warrants from liability to equity. Upon the closing of the transaction, the public warrants have been determined to meet the indexation criteria and equity classification criteria in accordance with ASC 815-40. The primary change resulting in the reclassification is the change in capital structure whereby a tender offer for the TMC common stock would result in a change in control, primarily resulting from TMC having a single voting class of common stock compared to the two classes of common stock at SOAC. Refer to Note 3(d) for the impact to the statement of operations associated with this reclassification.

The additional pro forma adjustment assuming maximum redemptions:

m) Reflects $300.1 million withdrawal of funds from the trust account to fund the redemption of 30.0 million public shares of SOAC at approximately $10.00 per share.

Note 3. Unaudited Pro Forma Condensed Combined Statements of Operations

The pro forma adjustments included in the unaudited pro forma condensed combined statements of operations for the three months ended March 31, 2021 and the year ended December 31, 2020, are as follows:

a) Represents the elimination of less than $0.1 million of interest income on SOAC's trust account for the three months ended March 31, 2021 and the year ended December 31, 2020.

b) Represents the amortization of the first two milestone payments associated with the third amendment to the PMTA over the effective life of the service period which was determined to start in July 2019 as the effective date of the first contract through September 2023 as the date of expected completion. The expense recognized for the year ended December 31, 2020 includes the expense from July 2019 through December 2020 while the expense included in the three months ended March 31, 2021 represents the amortization of expense for that period. Refer to Note 2(k) for further discussion.

c) Represents the elimination of the historical interest expense associated with the convertible debentures which will convert to DeepGreen common stock immediately prior to the closing of the transaction.

d) Represents the elimination of $20.3 million of historical fair value gains and $19.1 million of historical fair value losses associated with the public warrants for the three months ended March 31, 2021 and year ended December 31, 2020, respectively. The elimination of these fair value adjustments to the public warrants is a result of the public warrants being classified within equity upon the close of the Business Combination. Refer to Note 2(l) for more information.

Note 4. Loss Per Share

Pro Forma Weighted Average Shares (Basic and Diluted)

The following pro forma weighted average shares calculations have been performed for the three months ended March 31, 2021 and for the year ended December 31, 2020. The unaudited condensed combined pro forma loss per share ("LPS"), basic and diluted, are computed by dividing loss by the weighted-average number of shares of common stock outstanding during the period.

Prior to the Business Combination, SOAC had two classes of shares: Class A ordinary shares and Class B ordinary shares. The Class B ordinary shares are held by the Sponsor and directors. In connection with the closing of the Business Combination, each currently issued and outstanding SOAC Class B ordinary shares not converted into Sponsor Earnout Shares will automatically convert on a one-for-one basis, into SOAC Class A ordinary shares. Each currently issued and outstanding SOAC Class A ordinary share will thereafter be renamed, and will have the rights and restrictions attached to the, TMC Common Shares.

SOAC has 15 million outstanding public warrants sold during its initial public offering and 9.5 million warrants sold in a private placement, resulting in warrants to purchase an aggregate of 24.5 million Class A ordinary shares following the initial public offering. The warrants are exercisable at $11.50 per share which exceeds the current market price of SOAC's Class A ordinary shares. These warrants are considered anti-dilutive and excluded from the loss per share calculation when the exercise price exceeds the average market value of the ordinary share price during the applicable period.

In connection with the closing of the Business Combination, a total of 136.2 million TMC Special Shares will be outstanding (or will be underlying outstanding options) and will be convertible into TMC Common Shares if the TMC Common Share applicable price threshold is exceeded following the closing of the Business Combination. Because these underlying TMC Common Shares are contingently issuable based upon the price of the TMC Common Shares reaching specified thresholds that are not currently met, these contingent shares have been excluded from basic loss per share. The TMC Special Shares should be considered for diluted loss per share, however, these securities would be anti-dilutive given the historical pro forma net loss and have therefore, been excluded from diluted pro forma loss per share.

As part of the normal course of business, DeepGreen issued warrants to Allseas that shall be assumed by TMC upon consummation of the Business Combination and become exercisable into a variable number of TMC Common Shares, contingent upon the successful completion of the PMTS. The amount of TMC Common Shares to be issued upon exercise of the Allseas Warrant will vary depending on the date of successful completion of the PMTS. The Allseas Warrant has an exercise price of $0.01 per TMC Common Share and is not considered dilutive until the successful completion of the PMTS.

As a result, pro forma diluted LPS is the same as pro forma basic LPS for the periods presented.

	For the three months ended March 31, 2021		For the year ended December 31, 2020	
	Pro Forma Combined (Assuming No Redemption)	Pro Forma Combined (Assuming Maximum Redemption)	Pro Forma Combined (Assuming No Redemption)	Pro Forma Combined (Assuming Maximum Redemption)
Pro forma net loss attributable to common shareholders – basic and diluted	$ 46,887,738	$ 46,887,738	$ 81,208,861	$ 81,208,861
Weighted average shares outstanding – basic and diluted	300,348,305	270,348,305	300,348,305	270,348,305
Pro Forma Loss Per Share – basic and diluted	**$ 0.16**	**$ 0.17**	**$ 0.27**	**$ 0.30**
Pro Forma Weighted Average Shares – Basic and Diluted				
SOAC Public Shareholders	30,000,000	—	30,000,000	—
SOAC Initial Shareholders	6,759,000	6,759,000	6,759,000	6,759,000
Total SOAC	**36,759,000**	**6,759,000**	**36,759,000**	**6,759,000**
DeepGreen Metals shareholders	230,559,305	230,559,305	230,559,305	230,559,305
PIPE Investor(s)	33,030,000	33,030,000	33,030,000	33,030,000
Total Pro Forma Weighted Average Shares – basic and diluted	**300,348,305**	**270,348,305**	**300,348,305**	**270,348,305**

EXTRAORDINARY GENERAL MEETING OF SOAC

General

SOAC is furnishing this proxy statement/prospectus to SOAC's shareholders as part of the solicitation of proxies by the SOAC Board for use at the extraordinary general meeting of SOAC shareholders to be held on , 2021, and at any adjournment thereof. This proxy statement/prospectus is first being furnished to SOAC's shareholders on or about , 2021 in connection with the vote on the proposals described in this proxy statement/prospectus. This proxy statement/prospectus provides SOAC's shareholders with information they need to know to be able to vote or instruct their vote to be cast at the extraordinary general meeting.

Date, Time and Place

The extraordinary general meeting will be held at 10:30 a.m., Central Time, on , 2021, at the offices of Kirkland & Ellis LLP located at 609 Main Street, Houston, Texas 77002, and via a virtual meeting, or at such other date and at such other place to which the meeting may be adjourned.

Purpose of the Extraordinary General Meeting of SOAC

At the extraordinary general meeting, SOAC is asking holders of ordinary shares to consider and vote upon seven separate proposals:

1. **Proposal No. 1 — The Continuance Proposal — RESOLVED**, as a special resolution, that in connection with the Business Combination contemplated by that certain Business Combination Agreement, a copy of which is attached to this proxy statement/prospectus as Annex A, SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company existing and pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Part 9, Division 8 of the BCBCA, as described in more detail in the accompanying proxy statement/prospectus, and the form of the TMC Notice and Articles are attached to this proxy statement/prospectus as Annexes B and C, respectively.

2. **Proposal No. 2 — The Business Combination Proposal — RESOLVED**, as an ordinary resolution, that SOAC's entry into the Business Combination Agreement, pursuant to which, among other things, on the Closing Date, promptly following the Continuance, (A) pursuant to the Plan of Arrangement, (i) SOAC will acquire all of the issued and outstanding DeepGreen Common Shares, (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and options to purchase DeepGreen Common Shares, as applicable, the following shares or options to purchase the following shares: an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the effective time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of TMC and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, Canada, and (B) the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement and certain related agreements (including the Subscription Agreements, the Transaction Support Agreements, the Sponsor Letter Agreement and the Amended and Restated Registration Rights Agreement, each in the form attached to the proxy statement/prospectus as Annex E, Annex F, Annex G and Annex H, respectively), and the transactions contemplated thereby, be approved, ratified and confirmed in all respects.

3. **Proposal No. 3 — The Charter Proposal — RESOLVED,** as a result of and upon the consummation of the Continuance, as a special resolution, that the TMC Notice and Articles become, in replacement of the Existing Governing Documents (as defined below), the governing documents of TMC, including the change in authorized share capital and change of name of Sustainable Opportunities Acquisition Corp. to TMC the metals company Inc., each as reflected in the TMC Notice and Articles.

4. **Proposal No. 4 — The Organizational Documents Proposals** — to consider and vote upon, on a non-binding basis, certain governance provisions in the TMC Notice and Articles, to approve the following material differences between the Existing Governing Documents and the TMC Notice and Articles:

   - **Organizational Documents Proposal 4A** — the establishment of the authorized capital of TMC to consist of an unlimited number of common shares, an unlimited number of preferred shares, issuable in series, and the TMC Special Shares, in each case, without par value (this proposal is referred to herein as "Organizational Documents Proposal 4A").

   - **Organizational Documents Proposal 4B** — the declassification of the board of directors with the result being that each director will be elected annually (this proposal is referred to herein as "Organizational Documents Proposal 4B").

   - **Organizational Documents Proposal 4C** — the reduction of the requisite quorum for a meeting of shareholders from a majority to at least two shareholders representing no less than one-third ($33^{1/3}$%) of the shares entitled to vote at such meeting (this proposal is referred to herein as "Organizational Documents Proposal 4C").

   - **Organizational Documents Proposal 4D** — the inclusion of an advance notice provision that requires a shareholder to provide notice to TMC in advance of a meeting of shareholders should such shareholder wish to nominate a person for election to the board of directors (this proposal is referred to herein as "Organizational Documents Proposal 4D").

   - **Organizational Documents Proposal 4E** — the inclusion of a forum selection provision whereby, subject to limited exceptions or unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada, and the appellate courts therefrom, will be the sole and exclusive forum for certain shareholder litigation matters (this proposal is referred to herein as "Organizational Documents Proposal 4E").

   - **Organizational Documents Proposal 4F** — certain other changes, including changes to the rights and restrictions attached to the Class B ordinary shares, and the deletion of provisions relating to the initial public offering, the Sponsors, the initial business combination and other related matters (this proposal is referred to herein as "Organizational Documents Proposal 4F").

5. **Proposal No. 5 — The NYSE Proposal — RESOLVED**, as an ordinary resolution, that for the purposes of complying with the applicable provisions of NYSE Listing Rule 312.03, the issuance of TMC Common Shares and securities convertible into or exchangeable for TMC Common Shares in connection with the Business Combination and the PIPE Financing be approved.

6. **Proposal No. 6 — The Incentive Award Plan Proposal — RESOLVED**, as an ordinary resolution, that the TMC Incentive Equity Plan, a copy of which is attached to the accompanying proxy statement/prospectus as Annex D, be adopted and approved.

7. **Proposal No. 7 — The Adjournment Proposal — RESOLVED**, as an ordinary resolution, that the adjournment of the extraordinary general meeting to a later date or dates (A) to the extent necessary to ensure that any required supplement or amendment to the proxy statement/prospectus is provided to SOAC shareholders or, if as of the time for which the extraordinary general meeting is scheduled, there are insufficient SOAC ordinary shares represented (either in person or by proxy) to constitute a quorum necessary to conduct business at the extraordinary general meeting or (B) in order to solicit additional proxies from SOAC shareholders in favor of one or more of the proposals at the extraordinary general meeting be approved.

Each of the Continuance Proposal, the Business Combination Proposal, the Charter Proposal and the NYSE Proposal is conditioned on the approval and adoption of each of the other Condition Precedent Proposals. The Adjournment Proposal is not conditioned on any other proposal.

Recommendation of the SOAC Board

The SOAC Board believes that the Business Combination Proposal and the other proposals to be presented at the extraordinary general meeting are in the best interest of SOAC and its shareholders and unanimously recommends that its shareholders vote "FOR" the Continuance, "FOR" the Business Combination Proposal, "FOR" the Charter Proposal, "FOR" the Organizational Documents Proposals, "FOR" the NYSE Proposal, "FOR" the Incentive Award Plan Proposal and "FOR" the Adjournment Proposal, in each case, if presented to the extraordinary general meeting.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

Record Date; Who is Entitled to Vote

SOAC shareholders holding shares in "street name" will be entitled to vote or direct votes to be cast at the extraordinary general meeting if they owned ordinary shares at the close of business on , 2021, which is the "record date" for the extraordinary general meeting. Shareholders will have one (1) vote for each ordinary share owned at the close of business on the record date. If your shares are held in "street name" or are in a margin or similar account, you should contact your broker to ensure that votes related to the shares you beneficially own are properly counted. Our warrants do not have voting rights. As of the close of business on the record date, there were 37,500,000 ordinary shares issued and outstanding, of which 30,000,000 were issued and outstanding public shares.

Quorum

A quorum of SOAC shareholders is necessary to hold a valid meeting. A quorum will be present at the extraordinary general meeting if one or more shareholders who together hold not less than a majority of the issued and outstanding ordinary shares entitled to vote at the extraordinary general meeting are represented in person or by proxy at the extraordinary general meeting. As of the record date for the extraordinary general meeting, 18,750,001 ordinary shares would be required to achieve a quorum.

Abstentions and Broker Non-Votes

Proxies that are marked "abstain" and proxies relating to "street name" shares that are returned to SOAC but marked by brokers as "not voted" will be treated as shares present for purposes of determining the presence of a quorum on all matters. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the extraordinary general meeting, and otherwise will have no effect on a particular proposal. If a shareholder does not give the broker voting instructions, under applicable self-regulatory organization rules, its broker may not vote its shares on "non-routine" proposals, such as the Business Combination Proposal or any of the other Condition Precedent Proposals.

Vote Required for Approval

The approval of the Continuance Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

The approval of the Business Combination Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

The approval of the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

The Organizational Documents Proposals are voted on a non-binding advisory basis.

The approval of the NYSE Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

The approval of the Incentive Award Plan Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

The approval of the Adjournment Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

Each of the Business Combination Proposal, the Continuance Proposal, the Charter Proposal and the NYSE Proposal is conditioned on the approval and adoption of each of the other Condition Precedent Proposals. The Adjournment Proposal is not conditioned on any other proposal.

Voting Your Shares

Each ordinary share that you own in your name entitles you to one (1) vote. Your proxy card shows the number of ordinary shares that you own. If your shares are held in “street name” or are in a margin or similar account, you should contact your broker to ensure that votes related to the shares you beneficially own are properly counted.

There are two ways to vote your ordinary shares at the extraordinary general meeting:

- You can vote by signing and returning the enclosed proxy card. If you vote by proxy card, your “proxy,” whose name is listed on the proxy card, will vote your shares as you instruct on the proxy card. If you sign and return the proxy card but do not give instructions on how to vote your shares, your shares will be voted as recommended by the SOAC Board “FOR” the Continuance Proposal, “FOR” the Business Combination Proposal, “FOR” the Charter Proposal, “FOR” the Organizational Documents Proposals, “FOR” the NYSE Proposal, “FOR” the Incentive Award Plan Proposal and “FOR” the Adjournment Proposal, in each case, if presented to the extraordinary general meeting. Votes received after a matter has been voted upon at the extraordinary general meeting will not be counted.
- You can attend the extraordinary general meeting and vote in person. You will receive a ballot when you arrive. However, if your shares are held in the name of your broker, bank or another nominee, you must get a valid legal proxy from the broker, bank or other nominee. That is the only way SOAC can be sure that the broker, bank or nominee has not already voted your shares.

Revoking Your Proxy

If you are an SOAC shareholder and you give a proxy, you may revoke it at any time before it is exercised by doing any one of the following:

- you may send another proxy card with a later date;
- you may notify SOAC’s general counsel in writing before the extraordinary general meeting that you have revoked your proxy; or
- you may attend the extraordinary general meeting, revoke your proxy, and vote in person, as indicated above.

Who Can Answer Your Questions About Voting Your Shares

If you are a shareholder and have any questions about how to vote or direct a vote in respect of your ordinary shares, you may call Morrow Sodali LLC, our proxy solicitor, by calling (800) 662-5200, or banks and brokers can call collect at (203) 658-9400, or by emailing SOAC.info@investor.morrowsodali.com.

Redemption Rights

In connection with the proposed Business Combination, pursuant to the Existing Governing Documents, a public shareholder may request of SOAC that SOAC redeem all or a portion of its public shares for cash if the Business Combination is consummated. As a holder of public shares, you will be entitled to receive cash for any public shares to be redeemed only if you:

(i) (a) hold public shares, or (b) if you hold public shares through units, you elect to separate your units into the underlying public shares and warrants prior to exercising your redemption rights with respect to the public shares;

(ii) submit a written request to Continental, SOAC's transfer agent, in which you (i) request that SOAC redeem all or a portion of your public shares for cash and (ii) identify yourself as the beneficial holder of the public shares and provide your legal name, phone number and address; and

(iii) deliver your public shares to Continental, SOAC's transfer agent, physically or electronically through DTC.

Holders must complete the procedures for electing to redeem their public shares in the manner described above prior to 5:00 p.m., Eastern Time, on (two business days before the extraordinary general meeting) in order for their shares to be redeemed.

Holders of units must elect to separate the units into the underlying public shares and public warrants prior to exercising redemption rights with respect to the public shares. If holders hold their units in an account at a brokerage firm or bank, holders must notify their broker or bank that they elect to separate the units into the underlying public shares and public warrants, or if a holder holds units registered in its own name, the holder must contact Continental, SOAC's transfer agent, directly and instruct them to do so. The redemption rights include the requirement that a holder must identify itself in writing as a beneficial holder and provide its legal name, phone number and address to Continental in order to validly redeem its shares. Public shareholders are not required to affirmatively vote for or against the Business Combination Proposal or any of the other proposals set forth in this proxy statement/prospectus in order to redeem their public shares for cash. This means that public shareholders (other than those who have agreed not to do so by executing the Sponsor Letter Agreement) who hold public shares on or before , 2021 (two (2) business days before the extraordinary general meeting) may elect to redeem their public shares whether or not they are holders as of the record date, and whether or not they vote "FOR" the Business Combination Proposal or any of the other proposals set forth in this proxy statement/prospectus. If the Business Combination is not consummated, the public shares will be returned to the respective holder, broker or bank. If the Business Combination is consummated, and if a public shareholder properly exercises its right to redeem all or a portion of the public shares that it holds and timely delivers its shares to Continental, SOAC's transfer agent, TMC will redeem such public shares for a per-share price, payable in cash, equal to the pro rata portion of the trust account, calculated as of two business days prior to the consummation of the Business Combination. For illustrative purposes, as of , 2021, this would have amounted to approximately $ per issued and outstanding public share. If a public shareholder exercises its redemption rights in full, then it will be electing to exchange its public shares for cash and will no longer own public shares. The redemption takes place following the Continuance and accordingly it is TMC Common Shares that will be redeemed immediately after consummation of the Business Combination.

If you hold the shares in "street name," you will have to coordinate with your broker to have your shares certificated or delivered electronically. TMC Common Shares that have not been tendered (either physically or electronically) in accordance with these procedures will not be redeemed for cash. There is a nominal cost associated with this tendering process and the act of certificating the shares or delivering them through DTC's DWAC system. The transfer agent will typically charge the tendering broker $80 and it would be up to the broker whether or not to pass this cost on to the redeeming shareholder. In the event the proposed Business Combination is not consummated this may result in an additional cost to shareholders for the return of their shares.

Any request for redemption, once made by a holder of public shares, may be withdrawn at any time up to the time the vote is taken with respect to the Business Combination Proposal at the extraordinary general meeting. If you deliver your shares for redemption to Continental, our transfer agent, and later decide prior to the extraordinary general meeting not to elect redemption, you may request that our transfer agent return the shares (physically or electronically) to you. You may make such request by contacting Continental, our transfer agent, at the phone number or address listed at the end of this section.

Any corrected or changed written exercise of redemption rights must be received by Continental, our transfer agent, prior to the vote taken on the Business Combination Proposal at the extraordinary general meeting. No request for redemption will be honored unless the holder's public shares have been delivered (either physically or electronically) to Continental, our agent, at least two business days prior to the vote at the extraordinary general meeting.

Notwithstanding the foregoing, a public shareholder, together with any affiliate of such public shareholder or any other person with whom such public shareholder is acting in concert or as a "group" (as defined in Section 13(d)(3) of the Exchange Act), will be restricted from redeeming its public shares with respect to more than an aggregate of 15% of the public shares. Accordingly, if a public shareholder, alone or acting in concert or as a group, seeks to redeem more than 15% of the public shares, then any such shares in excess of that 15% limit would not be redeemed for cash.

The initial shareholders have, pursuant to the Sponsor Letter Agreement, agreed to, among other things, vote all of their ordinary shares in favor of the proposals being presented at the extraordinary general meeting and waive their redemption rights with respect to such ordinary shares in connection with the consummation of the Business Combination. Such shares will be excluded from the pro rata calculation used to determine the per-share redemption price. As of the date of this proxy statement/prospectus, the initial shareholders own approximately 20% of the issued and outstanding ordinary shares. See "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*" in the accompanying proxy statement/prospectus for more information related to the Sponsor Letter Agreement.

Holders of the warrants will not have redemption rights with respect to the warrants.

The closing price of public shares on , 2021 was $. For illustrative purposes, as of , 2021, funds in the trust account plus accrued interest thereon totaled approximately $ or $ per issued and outstanding public share.

Prior to exercising redemption rights, public shareholders should verify the market price of the public shares as they may receive higher proceeds from the sale of their public shares in the public market than from exercising their redemption rights if the market price per share is higher than the redemption price. SOAC cannot assure its shareholders that they will be able to sell their public shares in the open market, even if the market price per share is higher than the redemption price stated above, as there may not be sufficient liquidity in its securities when its shareholders wish to sell their shares.

Appraisal Rights

Neither our shareholders nor our warrant holders have appraisal rights in connection with the Business Combination or the Continuance under the Cayman Islands Companies Law or under the BCBCA.

Proxy Solicitation Costs

SOAC is soliciting proxies on behalf of its board of directors. This solicitation is being made by mail but also may be made by telephone or in person. SOAC and its directors, officers and employees may also solicit proxies in person, by telephone or by other electronic means. SOAC will bear the cost of the solicitation.

SOAC has hired Morrow to assist in the proxy solicitation process. SOAC will pay that firm a fee of $, plus disbursements. Such fee will be paid with non-trust account funds.

SOAC will ask banks, brokers and other institutions, nominees and fiduciaries to forward the proxy materials to their principals and to obtain their authority to execute proxies and voting instructions. SOAC will reimburse them for their reasonable expenses.

SOAC Initial Shareholders' Agreements

As of the date of this proxy statement/prospectus, there are 30,000,000 ordinary shares issued and outstanding, which includes an aggregate of 7,500,000 Class B ordinary shares held by the initial shareholders, including Sponsor. In addition, as of the date of this proxy statement/prospectus, there are outstanding an aggregate of 24,500,000 warrants, comprised of 9,500,000 private placement warrants held by Sponsor and the 15,000,000 public warrants.

At any time at or prior to the Business Combination, during a period when they are not then aware of any material nonpublic information regarding us or our securities, our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates may purchase public shares from institutional and other investors who vote, or indicate an intention to vote, against any of the Condition Precedent Proposals, or execute agreements to purchase such shares from such investors in the future, or they may enter into transactions with such investors and others to provide them with incentives to acquire public shares or vote their public shares in favor of the Condition Precedent Proposals. Such a purchase may include a contractual acknowledgement that such shareholder, although still the record or beneficial holder of our shares, is no longer the beneficial owner thereof and therefore agrees not to exercise its redemption rights. In the event that our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates purchase shares in privately negotiated transactions from public shareholders who have already elected to exercise their redemption rights, such selling shareholder would be required to revoke their prior elections to redeem their shares. The purpose of such share purchases and other transactions would be to increase the likelihood of satisfaction of the requirements that (i) the Business Combination Proposal, the Organizational Documents Proposals, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal are approved by the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, and (ii) the Continuance Proposal and the Charter Proposal are each approved by the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, or otherwise limit the number of public shares electing to redeem.

Entering into any such arrangements may have a depressive effect on the ordinary shares. For example, as a result of these arrangements, an investor or holder may have the ability to effectively purchase shares at a price lower than market and may therefore be more likely to sell the shares he or she owns, either at or prior to the Business Combination.

If such transactions are effected, the consequence could be to cause the Business Combination to be consummated in circumstances where such consummation could not otherwise occur. Purchases of shares by the persons described above would allow them to exert more influence over the approval of the proposals to be presented at the extraordinary general meeting and would likely increase the chances that such proposals would be approved. We will file or submit a Current Report on Form 8-K to disclose any material arrangements entered into or significant purchases made by any of the aforementioned persons that would affect the vote on the proposals to be put to the extraordinary general meeting or the redemption threshold. Any such report will include descriptions of any arrangements entered into or significant purchases by any of the aforementioned persons.

INFORMATION ABOUT SOAC

SOAC is a blank check company incorporated on December 18, 2019 as a Cayman Islands exempted company limited by shares and formed for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses. SOAC is an emerging growth company and, as such, SOAC is subject to all of the risks associated with emerging growth companies. All of SOAC's activities since inception have related to its formation and initial public offering, and since the closing of the initial public offering, a search for a business combination candidate.

SOAC's management team is supported by the Northern Pacific Group ("NPG"), a technology and business services focused private equity firm based in Wayzata, Minnesota that was co-founded by SOAC's Chairman, Scott Honour in 2012. NPG has considerable experience investing in environmental, social and governance ("ESG") related portfolio companies with community impact, workplace diversity and integrity, and environmental resource management acting as cornerstones to key investment decisions. NPG has offset its carbon footprint to net zero, achieving CarbonNeutral® status. The partners of NPG have been involved in acquisitions, financings and advisory transactions totaling over $20 billion in transaction value, have significant experience investing across a variety of economic cycles and have a track record of identifying targets with high-quality assets, businesses and management teams with significant resources, capital and optimization potential. NPG is strategically focused on sponsoring and supporting blank check companies either as a direct sponsor or under its portfolio companies. SOAC believes that it will benefit from NPG's prior experiences.

On May 8, 2020, SOAC consummated an initial public offering of 30,000,000 units at an offering price of $10.00 per unit, and a private placement with Sponsor of 9,500,000 private placement warrants at an offering price of $1.00 per warrant.

Following the closing of SOAC's initial public offering, an amount equal to $300,000,000 of the net proceeds from its initial public offering and the sale of the private placement warrants was placed in the trust account, and invested only in U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by SOAC meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of the Investment Company Act, as determined by SOAC, until the earlier of: (i) the completion of a Business Combination and (ii) the distribution of the trust account if SOAC does not complete a business combination within 18 months from the closing of the initial public offering, or November 8, 2021, unless SOAC proposes an amendment to its existing Amended and Restated Memorandum and Articles of Association that would affect the substance or timing of SOAC's obligation to complete a business combination within the Combination Period and provides its shareholders with the opportunity to redeem their Class A ordinary shares in conjunction with any such amendment.

SOAC's units, public shares and public warrants are currently listed on the NYSE under the symbols "SOAC.U," "SOAC" and "SOAC WS," respectively.

Financial Position

As of March 31, 2021, we had approximately $1.2 million in cash and a working capital deficit of approximately $3.4 million, and approximately $300 million of net proceeds were held in the trust account. With the funds available, SOAC offers a target business a variety of options such as creating a liquidity event for its owners, providing capital for the potential growth and expansion of its operations or strengthening its balance sheet by reducing its debt ratio. Because SOAC is able to complete the initial business combination using its cash, debt or equity securities, or a combination of the foregoing, SOAC has the flexibility to use the most efficient combination that will allow us to tailor the consideration to be paid to the target business to fit its needs and desires.

Effecting SOAC's Business Combination

Fair Market Value of Target Business

Pursuant to NYSE listing rules, the target business or businesses that SOAC acquires must collectively have a fair market value equal to at least 80% of the balance of the funds in the trust account (less any deferred

underwriting commissions and taxes payable on interest earned) at the time of the execution of a definitive agreement for SOAC's initial business combination. The SOAC Board determined that this test was met in connection with the proposed Business Combination.

Lack of Business Diversification

For an indefinite period of time after the completion of SOAC's initial business combination, the prospects for SOAC's success may depend entirely on the future performance of a single business. Unlike other entities that have the resources to complete business combinations with multiple entities in one or several industries, it is probable that SOAC will not have the resources to diversify SOAC's operations and mitigate the risks of being in a single line of business. By completing SOAC's initial business combination with only a single entity, SOAC's lack of diversification may:

- subject us to negative economic, competitive and regulatory developments, any or all of which may have a substantial adverse impact on the particular industry in which SOAC operate after the initial business combination; and
- cause us to depend on the marketing and sale of a single product or limited number of products or services.

Redemption Rights for Public Shareholders upon Completion of the Business Combination

SOAC is providing its public shareholders with the opportunity to redeem all or a portion of their public shares upon the completion of SOAC's initial business combination at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the trust account calculated as of two business days prior to the consummation of the initial business combination, including interest earned on the funds held in the trust account and not previously released to us to pay SOAC's income taxes, if any, divided by the number of the then-outstanding public shares, subject to the limitations described herein. As of , 2021, the amount in the trust account was approximately $ per public share. The per-share amount SOAC will distribute to shareholders who properly redeem their shares will not be reduced by the deferred underwriting commissions that SOAC will pay to the underwriters of its initial public offering. The redemption rights include the requirement that a beneficial holder must identify itself in writing as a beneficial holder and provide its legal name, phone number and address to the transfer agent in order to validly redeem its shares. There will be no redemption rights upon the completion of SOAC's initial business combination with respect to SOAC's warrants. Further, SOAC will not proceed with redeeming SOAC's public shares, even if a public shareholder has properly elected to redeem its shares, if the Business Combination does not close. The Redemptions referred to herein shall take effect as repurchases under the Existing Governing Documents.

Limitations on Redemption Rights

Notwithstanding the foregoing, the Existing Governing Documents provide that in no event will SOAC redeem SOAC's public shares in an amount that would cause SOAC's net tangible assets to be less than $5,000,001 (so that SOAC does not then become subject to the SEC's "penny stock" rules).

Redemption of Public Shares and Liquidation if No Business Combination

SOAC has until November 8, 2021 (unless such date is extended in accordance with the Existing Governing Documents) to complete a business combination. If SOAC is unable to consummate an initial business combination by November 8, 2021, SOAC will: (i) cease all operations except for the purpose of winding up; (ii) as promptly as reasonably possible but not more than ten business days thereafter, redeem the public shares, at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the trust account, including interest earned on the funds held in the trust account and not previously released to us to pay SOAC's income taxes, if any (less up to $100,000 of interest to pay dissolution expenses), divided by the number of the then-outstanding public shares, which redemption will completely extinguish public shareholders' rights as shareholders (including the right to receive further liquidation distributions, if any); and (iii) as promptly as reasonably possible following such redemption, subject to the approval of SOAC's remaining shareholders and the SOAC Board, liquidate and dissolve, subject in the case of clauses (ii) and (iii) to SOAC's obligations under Cayman Islands law to provide for claims of creditors and the requirements of other applicable law. There will be no redemption rights or liquidating

distributions with respect to SOAC's warrants, which will expire worthless if SOAC fail to consummate an initial business combination by November 8, 2021. The Existing Governing Documents provide that, if SOAC winds up for any other reason prior to the consummation of SOAC's initial business combination, SOAC will follow the foregoing procedures with respect to the liquidation of the trust account as promptly as reasonably possible but not more than ten business days thereafter, subject to applicable Cayman Islands law.

Sponsor and each member of SOAC's management team have entered into an agreement with us, pursuant to which they have agreed to waive their rights to liquidating distributions from the trust account with respect to any Founder Shares if SOAC fails to consummate an initial business combination by November 8, 2021 (although they will be entitled to liquidating distributions from the trust account with respect to any public shares they hold if SOAC fails to complete an initial business combination by November 8, 2021).

Sponsor and our executive officers and directors have agreed, pursuant to a written agreement with us, that they will not propose any amendment to the Existing Governing Documents that would affect the substance or timing of SOAC's obligation to provide holders of SOAC's Class A ordinary shares the right to have their shares redeemed in connection with the initial business combination or to redeem 100% of SOAC's public shares if SOAC does not complete an initial business combination by November 8, 2021, unless SOAC provide its public shareholders with the opportunity to redeem their public shares upon approval of any such amendment at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the trust account, including interest earned on the funds held in the trust account and not previously released to us to pay SOAC's income taxes, if any, divided by the number of the then-outstanding public shares. However, SOAC may not redeem its public shares in an amount that would cause its net tangible assets to be less than $5,000,001 (so that SOAC does not then become subject to the SEC's "penny stock" rules). If this optional redemption right is exercised with respect to an excessive number of public shares such that SOAC cannot satisfy the net tangible asset requirement, SOAC would not proceed with the amendment or the related redemption of SOAC's public shares at such time. This redemption right shall apply in the event of the approval of any such amendment, whether proposed by Sponsor, any executive officer, director or director nominee, or any other person.

SOAC expects that all costs and expenses associated with implementing SOAC's plan of dissolution, as well as payments to any creditors, will be funded from amounts remaining out of the proceeds of SOAC's initial public offering held outside the trust account plus up to $100,000 of funds from the trust account available to us to pay dissolution expenses, although SOAC cannot assure you that there will be sufficient funds for such purpose.

If SOAC were to expend all of the net proceeds of SOAC's initial public offering and the sale of the private placement warrants, other than the proceeds deposited in the trust account, and without taking into account interest, if any, earned on the trust account, the per-share redemption amount received by shareholders upon SOAC's dissolution would be $10.00. The proceeds deposited in the trust account could, however, become subject to the claims of SOAC's creditors which would have higher priority than the claims of SOAC's public shareholders. SOAC cannot assure you that the actual per-share redemption amount received by shareholders will not be less than $10.00. While SOAC intends to pay such amounts, if any, SOAC cannot assure you that SOAC will have funds sufficient to pay or provide for all creditors' claims.

Although SOAC will seek to have all vendors, service providers, prospective target businesses and other entities with which SOAC does business execute agreements waiving any right, title, interest or claim of any kind in or to any monies held in the trust account for the benefit of SOAC's public shareholders, there is no guarantee that they will execute such agreements, or even if they execute such agreements, that they would be prevented from bringing claims against the trust account including but not limited to fraudulent inducement, breach of fiduciary responsibility or other similar claims, as well as claims challenging the enforceability of the waiver, in each case in order to gain an advantage with respect to a claim against SOAC's assets, including the funds held in the trust account. If any third party refuses to execute an agreement waiving such claims to the monies held in the trust account, SOAC's management will perform an analysis of the alternatives available to it and will only enter into an agreement with a third party that has not executed a waiver if management believes that such third party's engagement would be significantly more beneficial in the best interests of SOAC given the circumstances. Examples of possible instances where SOAC may engage a third party that refuses to execute a waiver include the engagement of a third party consultant whose particular expertise or skills are believed by management to be significantly superior to those of other consultants that would agree to execute a waiver or in cases where management is unable to find a service provider willing to execute a waiver. In addition, there is no guarantee that such entities will

agree to waive any claims they may have in the future as a result of, or arising out of, any negotiations, contracts or agreements with us and will not seek recourse against the trust account for any reason. In order to protect the amounts held in the trust account, Sponsor has agreed that it will be liable to us if and to the extent any claims by a vendor for services rendered or products sold to us (other than our independent registered accounting firm), or a prospective target business with which SOAC have discussed entering into a transaction agreement, reduce the amounts in the trust account to below the lesser of (i) $10.00 per public share and (ii) the actual amount per public share held in the trust account as of the date of the liquidation of the trust account if less than $10.00 per public share due to reductions in the value of the trust assets, in each case net of the interest that may be withdrawn to pay SOAC's tax obligations, provided that such liability will not apply to any claims by a third party or prospective target business who executed a waiver of any and all rights to seek access to the trust account nor will it apply to any claims under SOAC's indemnity of the underwriters of SOAC's initial public offering against certain liabilities, including liabilities under the Securities Act. In the event that an executed waiver is deemed to be unenforceable against a third party, Sponsor will not be responsible to the extent of any liability for such third party claims. However, SOAC has not asked Sponsor to reserve for such indemnification obligations, nor has SOAC independently verified whether Sponsor has sufficient funds to satisfy its indemnity obligations and SOAC believes that Sponsor's only assets are securities of SOAC. Sponsor may not be able to satisfy those obligations. None of SOAC's officers or directors will indemnify us for claims by third parties including, without limitation, claims by vendors and prospective target businesses.

In the event that the proceeds in the trust account are reduced below the lesser of (i) $10.00 per public share and (ii) the actual amount per public share held in the trust account as of the date of the liquidation of the trust account if less than $10.00 per public share due to reductions in the value of the trust assets, in each case net of the interest that may be withdrawn to pay SOAC's tax obligations, and Sponsor asserts that it is unable to satisfy its indemnification obligations or that it has no indemnification obligations related to a particular claim, SOAC's independent directors would determine whether to take legal action against Sponsor to enforce its indemnification obligations. While SOAC currently expects that its independent directors would take legal action on SOAC's behalf against Sponsor to enforce its indemnification obligations to us, it is possible that SOAC's independent directors in exercising their business judgment may choose not to do so in any particular instance. Accordingly, SOAC cannot assure you that due to claims of creditors the actual value of the per-share redemption price will not be less than $10.00 per public share.

SOAC will seek to reduce the possibility that Sponsor will have to indemnify the trust account due to claims of creditors by endeavoring to have all vendors, service providers, prospective target businesses or other entities with which SOAC does business execute agreements with us waiving any right, title, interest or claim of any kind in or to monies held in the trust account. Sponsor will also not be liable as to any claims under SOAC's indemnity of the underwriters of SOAC's initial public offering against certain liabilities, including liabilities under the Securities Act. SOAC has access to up to $2.5 million from the proceeds of the initial public offering and the sale of the private placement warrants with which to pay any such potential claims (including costs and expenses incurred in connection with SOAC's liquidation, currently estimated to be no more than approximately $100,000). In the event that SOAC liquidates and it is subsequently determined that the reserve for claims and liabilities is insufficient, shareholders who received funds from SOAC's trust account could be liable for claims made by creditors; however, such liability will not be greater than the amount of funds from SOAC's trust account received by any such shareholder.

If SOAC files a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, the proceeds held in the trust account could be subject to applicable bankruptcy law, and may be included in SOAC's bankruptcy estate and subject to the claims of third parties with priority over the claims of SOAC's shareholders. To the extent any bankruptcy claims deplete the trust account, SOAC cannot assure you SOAC will be able to return $10.00 per public share to SOAC's public shareholders. Additionally, if SOAC files a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, any distributions received by shareholders could be viewed under applicable debtor/creditor and/or bankruptcy laws as either a "preferential transfer" or a "fraudulent conveyance."

As a result, a bankruptcy court could seek to recover some or all amounts received by SOAC's shareholders. Furthermore, the SOAC Board may be viewed as having breached its fiduciary duty to SOAC's creditors and/or may

have acted in bad faith, and thereby exposing itself and SOAC's company to claims of punitive damages, by paying public shareholders from the trust account prior to addressing the claims of creditors. SOAC cannot assure you that claims will not be brought against us for these reasons.

See "*Risk Factors — Risks Related to the Business Combination and SOAC — If, after SOAC distribute the proceeds in the trust account to SOAC's public shareholders, SOAC file a bankruptcy petition or an involuntary bankruptcy petition is filed against us that is not dismissed, a bankruptcy court may seek to recover such proceeds, and SOAC and the SOAC Board may be exposed to claims of punitive damages*."

Employees

SOAC currently has three executive officers. These individuals are not obligated to devote any specific number of hours to SOAC's matters but they intend to devote as much of their time as they deem necessary to SOAC's affairs until SOAC has completed its initial business combination. The amount of time they will devote in any time period will vary based on whether a target business has been selected for SOAC's initial business combination and the stage in which it is in of the business combination process. SOAC does not intend to have any full-time employees prior to the completion of the initial business combination.

Directors and Executive Officers

SOAC's officers and directors are as follows:

Name	Age	Position
Scott Leonard	46	Chief Executive Officer and Director
Scott Honour	53	Chairman
David Quiram	46	Chief Financial Officer
Rick Gaenzle	55	Director
Isaac Barchas	53	Director
Justin Kelly	49	Director

Scott Leonard is SOAC's Chief Executive Officer and on SOAC's board of directors. Mr. Leonard has over 15 years of experience leading highly successful business transformations and transitions. Mr. Leonard also has deep expertise over the past 8 years driving decarbonization through technology adoption, product lifecycle management and development and industrial demand destruction. Mr. Leonard has held various roles at both public and private companies including Chief Executive Officer, Chief Financial Officer, Chief Restructuring Officer and Independent Director. Previously, Mr. Leonard served as Chief Financial Officer/Chief Restructuring Officer at GenOn Energy from 2017 until 2018, and Chief Executive Officer of GenOn Mid-Atlantic LLC in 2018. From 2014 to 2016, Mr. Leonard was at Hewlett Packard Enterprise (NYSE: HPE), where he served as the Senior Vice President of Global Commercial Functions for the Enterprise Services business. Prior to that, Mr. Leonard served as Deputy Executive Director, Chief Strategy & Administrative Officer for the Texas Department of Transportation from 2012 to 2014. From 2005 to 2012, Mr. Leonard held positions as Senior Vice President, Performance Improvement and Vice President, Corporate Planning at TXU Corp. and its successor Energy Future Holdings Corp. Mr. Leonard previously served on the board of directors of NRG REMA, LLC and Lonestar II Generation Holdings. Earlier in his career, Mr. Leonard was with McKinsey & Co. as a management consultant and Donaldson Lufkin & Jenrette as an investment banker. Mr. Leonard earned a B.S. with Highest Honors from Georgia Tech, and an M.B.A. with Distinction from The Kellogg Graduate School of Management at Northwestern.

Scott Honour is the Chairman of the SOAC Board. Mr. Honour has over 30 years of private equity investment experience and has been involved in over 100 transactions totaling over $20 billion in transaction value. Mr. Honour is Managing Partner of NPG, a private equity firm, which he co-founded in 2012. Prior to that, Mr. Honour was at The Gores Group, a Los Angeles based private equity firm, for 10 years, serving as Senior Managing Director and one of the firm's top executives. During his time at The Gores Group, the firm raised four funds, totaling $4 billion in aggregate, and made over 35 investments. Mr. Honour also served on the investment committee for The Gores Group. Prior to joining The Gores Group, Mr. Honour was a Managing Director at UBS Investment Bank from 2000 to 2002 and was an investment banker at Donaldson, Lufkin & Jenrette from 1991 to 2000. Mr. Honour began his career at Trammell Crow Company in 1988. Mr. Honour has served on the board of directors of numerous public and private companies including Solar Spectrum Holdings LLC, Anthem Sports & Entertainment Inc., 1st Choice

Delivery, LLC, United Language Group, Inc., Renters Warehouse LLC, Real Dolmen (REM:BB) and Westwood One, Inc. (formerly NASDAQ: WWON), and is a co-founder of Titan CNG LLC and YapStone Inc. Mr. Honour earned a B.S. and B.A., *cum laude*, in Business Administration and Economics from Pepperdine University and an M.B.A. in Finance and Marketing from the Wharton School of the University of Pennsylvania.

David Quiram is SOAC's Chief Financial Officer. Dr. Quiram has over 20 years of leadership experience in technology, strategy and finance organizations with a deep understanding of the chemicals, emerging technology, bioscience and energy sectors. Previously, Dr. Quiram served as Head of Financial Planning and Analysis and Tax at GenOn Energy from 2017 until 2019 where he was responsible for standing up the financial and administrative functions of GenOn as a stand-alone entity from NRG Energy Inc. (NYSE: NRG). Prior to that, Dr. Quiram served as Head of Investments for Enterprise Services of Hewlett Packard Enterprise (NYSE: HPE) from 2014 until 2017 where he directed investments into products and services. From 2010 to 2014, Dr. Quiram was with Accenture (NYSE: ACN) as a Senior Manager in their Strategy practice focused on transforming utilities, independent power producers, and energy retailers. From 2006 to 2009, Dr. Quiram worked at multiple roles at TXU Energy starting in finance and later served as Vice President of Retail Pricing and Procurement where he led the pricing and hedging for TXU Energy's retail portfolio. Dr. Quiram began his career at McKinsey & Co where he worked as an Engagement Manager from 2001 until 2005, and as a Research Scientist at DuPont (NYSE: DD) from 1998 to 2001. Dr. Quiram earned a B.S. in Chemical Engineering with Highest Distinction from the University of Virginia, and an M.S. and Ph.D. in Chemical Engineering from the Massachusetts Institute of Technology.

Rick Gaenzle serves on the SOAC Board. Mr. Gaenzle has over 30 years of private equity investment and corporate finance experience; he is the founder and currently serves as a Managing Director of Gilbert Global Equity Capital, L.L.C., the principal investment advisor to Gilbert Global Equity Partners, L.P. and related entities, a $1.2 billion leveraged buyout and private equity fund. Mr. Gaenzle has spent the last twenty-eight years at Gilbert Global and its predecessor entity, completing over 110 direct equity investments, co-investments and add-on acquisitions for portfolio companies. Previously, Mr. Gaenzle was a Principal of Soros Capital L.P., the principal venture capital and leveraged equity entity of the Quantum Group of Funds and a principal advisor to Quantum Industrial Holdings Ltd. Prior to joining Soros Capital, Mr. Gaenzle held various positions at PaineWebber Inc. Mr. Gaenzle currently serves as a Senior Advisor to Impact Delta, an impact-investing and impact-measurement advisory firm; an Operating Partner of NPG; and Chairman of Lake Street Homes, a single-family rental investment vehicle. Mr. Gaenzle holds a B.A. from Hartwick College and an M.B.A. from Fordham University.

Isaac Barchas serves on the SOAC Board. Mr. Barchas is the President and Chief Executive Officer of Research Bridge Partners ("RBP"), a socially-driven investment company, which he founded in 2016. RBP uses both concessionary and nonconcessionary investment to create startup companies based on university research and advance those companies into the venture capital markets. Prior to founding RBP, Mr. Barchas led the Austin Technology Incubator ("ATI") at The University of Texas at Austin from 2006 to 2016. ATI's Clean Energy Incubator was the first university clean tech incubation program in the United States. During Mr. Barchas' leadership, ATI companies raised over $1 billion in the capital markets. Mr. Barchas joined the university from McKinsey & Co., where he worked in the Chicago, Sydney, Auckland and Dallas offices, from 1996 to 2006 and served on the leadership teams of McKinsey's North American Healthcare Practice and Global Organization Practice. Mr. Barchas has served on multiple private company boards and on philanthropic boards including Pecan Street Inc., the largest analytically-focused clean energy and climate data consortium in the United States, where he was a founding board member. Mr. Barchas earned a J.D. (honors) and M.A. (Century Fellowship) from The University of Chicago. He received an A.B. from Stanford University (honors and Phi Beta Kappa).

Justin Kelly serves on the SOAC Board. Mr. Kelly is currently the Chief Executive Officer and Chief Investment Officer of Winslow Capital Management, LLC ("Winslow Capital"), Nuveen's center of excellence for growth investing. Mr. Kelly also serves as lead portfolio manager on the firm's flagship U.S. Large Cap Growth Strategy. Mr. Kelly has been with Winslow Capital for over two decades and has transformed the firm from a single strategy, niche investment firm to a thought leader globally in growth equity investing with four strategies. Prior to joining Winslow Capital in 1999, Mr. Kelly was an equity analyst at Investment Advisors in Minneapolis. Prior to that, Mr. Kelly worked at Prudential Bache, from 1993 to 1996 as Investment Banker, and Salomon Brothers, from 1996 to 1997 as Investment Banker. Mr. Kelly earned a B.S. in Finance/Investments from Babson College.

Number and Terms of Office of Officers and Directors

The SOAC Board is divided into three classes, with only one class of directors being elected in each year, and with each class (except for those directors appointed prior to SOAC's first annual meeting of shareholders) serving a three-year term. In accordance with the NYSE corporate governance requirements, SOAC is not required to hold an annual meeting until one year after SOAC's first fiscal year end following SOAC's listing on the NYSE. The term of office of the first class of directors, consisting of Rick Gaenzle, will expire at SOAC's first annual meeting of shareholders. The term of office of the second class of directors, consisting of Isaac Barchas and Justin Kelly, will expire at SOAC's second annual meeting of shareholders. The term of office of the third class of directors, consisting of Scott Leonard and Scott Honour, will expire at SOAC's third annual meeting of shareholders.

Prior to the completion of an initial business combination, any vacancy on the board of directors may be filled by a nominee chosen by holders of a majority of SOAC's Founder Shares. In addition, prior to the completion of an initial business combination, holders of a majority of SOAC's Founder Shares may remove a member of the board of directors for any reason.

Pursuant to an agreement to be entered into on or prior to the closing of this offering, Sponsor, upon and following consummation of an initial business combination, will be entitled to nominate three individuals for election to the SOAC Board, as long as Sponsor holds any securities covered by the Amended and Restated Registration Rights Agreement.

SOAC's officers are appointed by the SOAC Board and serve at the discretion of the SOAC Board, rather than for specific terms of office. The SOAC Board is authorized to appoint persons to the offices set forth in SOAC's amended and restated memorandum and articles of association as it deems appropriate. SOAC's amended and restated memorandum and articles of association provides that SOAC's officers may consist of one or more chairman of the board, chief executive officer, president, chief financial officer, vice presidents, secretary, treasurer and such other offices as may be determined by the board of directors.

Committees of the Board of Directors

The SOAC Board has three standing committees: an audit committee, a nominating committee and a compensation committee. Each committee operates under a charter that has been approved by SOAC's board and has the composition and responsibilities described below. The charter of each committee is available on SOAC's website. The rules of the NYSE and Rule 10A-3 of the Exchange Act require that the audit committee of a listed company be comprised solely of independent directors. Also subject to phase-in rules and a limited exception, the rules of the NYSE require that the compensation committee and the nominating committee of a listed company be comprised solely of independent directors.

Audit Committee

SOAC has established an audit committee of the board of directors. Rick Gaenzle, Isaac Barchas and Justin Kelly will serve as members of SOAC's audit committee. The SOAC Board has determined that each of Rick Gaenzle, Isaac Barchas and Justin Kelly are independent under the NYSE listing standards and applicable SEC rules. Rick Gaenzle will serve as the Chairman of the audit committee. Each member of the audit committee is financially literate and the SOAC Board has determined that Rick Gaenzle qualifies as an "audit committee financial expert" as defined in applicable SEC rules.

The audit committee is responsible for:

- meeting with SOAC's independent registered public accounting firm regarding, among other issues, audits, and adequacy of SOAC's accounting and control systems;
- monitoring the independence of the independent registered public accounting firm;
- verifying the rotation of the lead (or coordinating) audit partner having primary responsibility for the audit and the audit partner responsible for reviewing the audit as required by law;
- inquiring and discussing with management SOAC's compliance with applicable laws and regulations;

- pre-approving all audit services and permitted non-audit services to be performed by SOAC's independent registered public accounting firm, including the fees and terms of the services to be performed;
- appointing or replacing the independent registered public accounting firm;
- determining the compensation and oversight of the work of the independent registered public accounting firm (including resolution of disagreements between management and the independent auditor regarding financial reporting) for the purpose of preparing or issuing an audit report or related work;
- establishing procedures for the receipt, retention and treatment of complaints received by us regarding accounting, internal accounting controls or reports which raise material issues regarding SOAC's financial statements or accounting policies;
- monitoring compliance on a quarterly basis with the terms of this offering and, if any noncompliance is identified, immediately taking all action necessary to rectify such noncompliance or otherwise causing compliance with the terms of this offering; and
- reviewing and approving all payments made to SOAC's existing shareholders, executive officers or directors and their respective affiliates. Any payments made to members of SOAC's audit committee will be reviewed and approved by the SOAC Board, with the interested director or directors abstaining from such review and approval.

Nominating Committee

SOAC has established a nominating committee of the SOAC Board. The members of SOAC's nominating committee are Rick Gaenzle, Isaac Barchas and Justin Kelly, and Isaac Barchas serves as chairman of the nominating committee. Under the NYSE listing standards, SOAC is required to have a nominating committee composed entirely of independent directors. The SOAC Board has determined that each of Rick Gaenzle, Isaac Barchas and Justin Kelly are independent.

The nominating committee is responsible for overseeing the selection of persons to be nominated to serve on the SOAC Board. The nominating committee considers persons identified by its members, management, shareholders, investment bankers and others.

Guidelines for Selecting Director Nominees

The guidelines for selecting nominees, which are specified in a charter adopted by us, generally provide that persons to be nominated:

- should have demonstrated notable or significant achievements in business, education or public service;
- should possess the requisite intelligence, education and experience to make a significant contribution to the board of directors and bring a range of skills, diverse perspectives and backgrounds to its deliberations; and
- should have the highest ethical standards, a strong sense of professionalism and intense dedication to serving the interests of the shareholders.

The nominating committee considers a number of qualifications relating to management and leadership experience, background and integrity and professionalism in evaluating a person's candidacy for membership on the board of directors. The nominating committee may require certain skills or attributes, such as financial or accounting experience, to meet specific board needs that arise from time to time and will also consider the overall experience and makeup of its members to obtain a broad and diverse mix of board members. The nominating committee does not distinguish among nominees recommended by shareholders and other persons.

Compensation Committee

SOAC has established a compensation committee of the SOAC Board. The members of SOAC's compensation committee are Rick Gaenzle, Isaac Barchas and Justin Kelly, and Justin Kelly serves as chairman of the compensation committee.

The SOAC Board has determined that each of Rick Gaenzle, Isaac Barchas and Justin Kelly are independent. SOAC adopted a compensation committee charter, which details the principal functions of the compensation committee, including:

- reviewing and approving on an annual basis the corporate goals and objectives relevant to SOAC's Chief Executive Officer's compensation, evaluating SOAC's Chief Executive Officer's performance in light of such goals and objectives and determining and approving the remuneration (if any) of SOAC's Chief Executive Officer based on such evaluation;
- reviewing and approving the compensation of all of SOAC's other Section 16 executive officers;
- reviewing SOAC's executive compensation policies and plans;
- implementing and administering SOAC's incentive compensation equity-based remuneration plans;
- assisting management in complying with SOAC's proxy statement and annual report disclosure requirements;
- approving all special perquisites, special cash payments and other special compensation and benefit arrangements for SOAC's executive officers and employees;
- producing a report on executive compensation to be included in SOAC's annual proxy statement; and
- reviewing, evaluating and recommending changes, if appropriate, to the remuneration for directors.

The charter also provides that the compensation committee may, in its sole discretion, retain or obtain the advice of a compensation consultant, legal counsel or other adviser and will be directly responsible for the appointment, compensation and oversight of the work of any such adviser. However, before engaging or receiving advice from a compensation consultant, external legal counsel or any other adviser, the compensation committee will consider the independence of each such adviser, including the factors required by the NYSE and the SEC.

Compensation Committee Interlocks and Insider Participation

None of SOAC's executive officers currently serves, and in the past year has not served, as a member of the compensation committee of any entity that has one or more executive officers serving on the SOAC Board.

Code of Ethics

SOAC adopted a Code of Ethics applicable to SOAC's directors, officers and employees. A copy of the Code of Ethics will be provided without charge upon request to us. SOAC intends to disclose any amendments to or waivers of certain provisions of SOAC's Code of Ethics in a Current Report on Form 8-K.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires SOAC's officers, directors and persons who beneficially own more than 10% of SOAC's ordinary shares to file reports of ownership and changes in ownership with the SEC. These reporting persons are also required to furnish us with copies of all Section 16(a) forms they file.

Conflicts of Interest

Under Cayman Islands law, all of SOAC's directors owe three types of duties to us: (i) statutory duties; (ii) fiduciary duties; and (iii) common law duties. A Cayman Islands director's fiduciary duties are not codified, however the courts of the Cayman Islands have held that a director owes the following fiduciary duties: (a) a duty to act in what the director bona fide considers to be in the best interests of the company; (b) a duty to exercise their powers for the purposes they were conferred; (c) a duty to avoid fettering his or her discretion in the future; and

(d) a duty to avoid conflicts of interest and of duty. The common law duties owed by a director are those to act with skill, care and diligence that may reasonably be expected of a person carrying out the same functions as are carried out by that director in relation to the company and, also, to act with the skill, care and diligence in keeping with a standard of care commensurate with any particular skill they have which enables them to meet a higher standard than a director without those skills. In fulfilling their duty of care to us, SOAC's directors must ensure compliance with the Existing Governing Documents. SOAC have the right to seek damages if a duty owed by any of SOAC's directors is breached. As set out above, directors have a duty not to put themselves in a position of conflict and this includes a duty not to engage in self-dealing, or to otherwise benefit as a result of their position. However, in some instances what would otherwise be a breach of this duty can be forgiven and/or authorized in advance by the shareholders provided that there is full disclosure by the directors. This can be done by way of permission granted in the Existing Governing Documents or alternatively by shareholder approval at general meetings.

Certain of SOAC's officers and directors presently have, and any of them in the future may have, additional, fiduciary or contractual obligations to other entities, including entities that are affiliates of Sponsor, pursuant to which such officer or director is or will be required to present a business combination opportunity to such entity. Accordingly, if any of SOAC's officers or directors becomes aware of a business combination opportunity which is suitable for an entity to which he or she has then-current fiduciary or contractual obligations, he or she will honor his or her fiduciary or contractual obligations to present such business combination opportunity to such entity, subject to their fiduciary duties under Cayman Islands law. SOAC does not believe, however, that the fiduciary duties or contractual obligations of SOAC's officers or directors will materially affect SOAC's ability to complete SOAC's initial business combination.

Potential investors should also be aware of the following other potential conflicts of interest:

- SOAC's executive officers and directors are not required to, and will not, commit their full time to SOAC's affairs, which may result in a conflict of interest in allocating their time between SOAC's operations and SOAC's search for a business combination and their other businesses. SOAC does not intend to have any full-time employees prior to the completion of SOAC's initial business combination. Each of SOAC's executive officers are engaged in several other business endeavors for which he may be entitled to substantial compensation, and SOAC's executive officers are not obligated to contribute any specific number of hours per week to SOAC's affairs.

- Sponsor subscribed for Founder Shares prior to the date of the initial public offering and purchased private placement warrants in a transaction that closes simultaneously with the closing of this initial public offering.

- SOAC's officers and directors may have a conflict of interest with respect to evaluating a particular business combination if the retention or resignation of any such officers and directors was included by a target business as a condition to any agreement with respect to SOAC's initial business combination.

- Sponsor and each member of SOAC's management team have entered into agreements with SOAC, pursuant to which they have agreed to waive their redemption rights with respect to their Founder Shares and Ordinary Shares in connection with (i) the completion of SOAC's initial business combination and (ii) a shareholder vote to approve an amendment to SOAC's amended and restated memorandum and articles of association that would affect the substance or timing of SOAC's obligation to provide holders of SOAC's Class A ordinary shares the right to have their shares redeemed in connection with SOAC's initial business combination or to redeem 100% of SOAC's public shares if SOAC does not consummate an initial business combination within 18 months from the closing of this offering. Additionally, Sponsor has agreed to waive its rights to liquidating distributions from the trust account with respect to its Founder Shares if SOAC fails to complete SOAC's initial business combination within the prescribed time frame. If SOAC does not consummate an initial business combination within the prescribed time frame, the private placement warrants will expire worthless. Except as described herein, Sponsor and SOAC's directors and executive officers have agreed not to transfer, assign or sell any of their Founder Shares until the earliest of (A) one year after the completion of SOAC's initial business combination or (B) subsequent to SOAC's initial business combination, (x) if the closing price of SOAC's Class A ordinary shares equals or exceeds $12.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after SOAC's initial business combination, or

(y) the date on which SOAC complete a liquidation, merger, share exchange or other similar transaction that results in all of SOAC's shareholders having the right to exchange their ordinary shares for cash, securities or other property. The private placement warrants will not be transferable until 30 days following the completion of SOAC's initial business combination. Because each of SOAC's executive officers and director nominees own ordinary shares or warrants directly or indirectly, they may have a conflict of interest in determining whether a particular target business is an appropriate business with which to effectuate SOAC's initial business combination.

- SOAC's officers and directors may have a conflict of interest with respect to evaluating a particular business combination if the retention or resignation of any such officers and directors is included by a target business as a condition to any agreement with respect to SOAC's initial business combination.
- SOAC cannot assure you that any of the above mentioned conflicts will be resolved in SOAC's favor.

Accordingly, as a result of multiple business affiliations, SOAC's officers and directors may have similar legal obligations relating to presenting business opportunities meeting the above-listed criteria to multiple entities. If any of the above executive officers or directors become aware of a business combination opportunity which is suitable for any of the above entities to which he or she has then-current fiduciary or contractual obligations, he or she will honor his or her fiduciary or contractual obligations to present such business combination opportunity to such entity, and only present it to SOAC if such entity rejects the opportunity, subject to their fiduciary duties under Cayman Islands law. SOAC does not believe, however, that any of the foregoing fiduciary duties or contractual obligations will materially affect SOAC's ability to complete a business combination.

Sponsor, SOAC's Founders and each member of SOAC's management team have agreed to vote their Founder Shares and any public shares purchased during or after the initial public offering in favor of the proposed Business Combination.

Limitation on Liability and Indemnification of Officers and Directors

Cayman Islands law does not limit the extent to which a company's memorandum and articles of association may provide for indemnification of officers and directors, except to the extent any such provision may be held by the Cayman Islands courts to be contrary to public policy, such as to provide indemnification against willful default, willful neglect, civil fraud or the consequences of committing a crime. The Existing Governing Documents provide for indemnification of SOAC's officers and directors to the maximum extent permitted by law, including for any liability incurred in their capacities as such, except through their own actual fraud, willful default or willful neglect. SOAC will enter into agreements with SOAC's directors and officers to provide contractual indemnification in addition to the indemnification provided for in SOAC's amended and restated memorandum and articles of association. SOAC expect to purchase a policy of directors' and officers' liability insurance that insures SOAC's officers and directors against the cost of defense, settlement or payment of a judgment in some circumstances and insures us against SOAC's obligations to indemnify SOAC's officers and directors.

Our officers and directors have agreed to waive any right, title, interest or claim of any kind in or to any monies in the trust account, and have agreed to waive any right, title, interest or claim of any kind they may have in the future as a result of, or arising out of, any services provided to us and will not seek recourse against the trust account for any reason whatsoever (except to the extent they are entitled to funds from the trust account due to their ownership of public shares). Accordingly, any indemnification provided will only be able to be satisfied by us if (i) SOAC has sufficient funds outside of the trust account or (ii) SOAC consummates an initial business combination.

Our indemnification obligations may discourage shareholders from bringing a lawsuit against SOAC's officers or directors for breach of their fiduciary duty. These provisions also may have the effect of reducing the likelihood of derivative litigation against SOAC's officers and directors, even though such an action, if successful, might otherwise benefit us and SOAC's shareholders. Furthermore, a shareholder's investment may be adversely affected to the extent SOAC pays the costs of settlement and damage awards against SOAC's officers and directors pursuant to these indemnification provisions.

SOAC believes that these provisions, the insurance and the indemnity agreements are necessary to attract and retain talented and experienced officers and directors.

Executive Compensation and Director Compensation and Other Interests

In March 2020, Sponsor transferred 30,000 Class B ordinary shares to each of Messrs. Gaenzle, Barchas and Kelly. None of SOAC's executive officers or directors have received any cash compensation for services rendered to SOAC. Commencing on the date that SOAC's securities were first listed on the NYSE through the earlier of consummation of SOAC's initial business combination and SOAC's liquidation, SOAC will reimburse an affiliate of SOAC's sponsor for office space, secretarial and administrative services provided to us in the amount of $10,000 per month. In addition, Sponsor, executive officers and directors, or any of their respective affiliates will be reimbursed for any out-of-pocket expenses incurred in connection with activities on SOAC's behalf such as identifying potential target businesses and performing due diligence on suitable business combinations. SOAC's audit committee will review on a quarterly basis all payments that were made to SOAC's sponsor, executive officers or directors, or SOAC's or their affiliates. Any such payments prior to an initial business combination will be made using funds held outside the trust account. Other than quarterly audit committee review of such reimbursements, SOAC does not expect to have any additional controls in place governing SOAC's reimbursement payments to SOAC's directors and executive officers for their out-of-pocket expenses incurred in connection with SOAC's activities on SOAC's behalf in connection with identifying and consummating an initial business combination. Other than these payments and reimbursements, no compensation of any kind, including finder's and consulting fees, will be paid by SOAC to Sponsor, executive officers and directors, or any of their respective affiliates, prior to completion of SOAC's initial business combination.

After the completion of SOAC's initial business combination, directors or members of SOAC's management team who remain with us may be paid consulting or management fees from the combined company. All of these fees will be fully disclosed to shareholders, to the extent then known, in the proxy solicitation materials or tender offer materials furnished to SOAC's shareholders in connection with a proposed business combination. SOAC has not established any limit on the amount of such fees that may be paid by the combined company to SOAC's directors or members of management. It is unlikely the amount of such compensation will be known at the time of the proposed business combination, because the directors of the post-combination business will be responsible for determining executive officer and director compensation. Any compensation to be paid to SOAC's executive officers will be determined, or recommended to the SOAC Board for determination, either by a compensation committee constituted solely by independent directors or by a majority of the independent directors on the SOAC Board.

SOAC does not intend to take any action to ensure that members of SOAC's management team maintain their positions with SOAC after the consummation of SOAC's initial business combination, although it is possible that some or all of SOAC's executive officers and directors may negotiate employment or consulting arrangements to remain with us after SOAC's initial business combination. The existence or terms of any such employment or consulting arrangements to retain their positions with SOAC may influence SOAC's management's motivation in identifying or selecting a target business but SOAC does not believe that the ability of SOAC's management to remain with SOAC after the consummation of SOAC's initial business combination will be a determining factor in SOAC's decision to proceed with any potential business combination. SOAC is not party to any agreements with SOAC's executive officers and directors that provide for benefits upon termination of employment.

Director Independence

NYSE listing standards require that a majority of the SOAC Board be independent. The SOAC Board has determined that Rick Gaenzle, Isaac Barchas and Justin Kelly are "independent directors" as defined in the NYSE listing standards. SOAC's independent directors have regularly scheduled meetings at which only independent directors are present.

Legal Proceedings

There is no material litigation, arbitration or governmental proceeding currently pending or to SOAC's knowledge, threatened against us or any members of SOAC's management team in their capacity as such.

Properties

SOAC currently maintains its registered offices at 1601 Bryan Street, Suite 4141, Dallas, Texas 75201. The cost for SOAC's use of this space is included in the $10,000 per month fee SOAC pays to Sponsor for office space, administrative and support services. Upon consummation of the Business Combination, the principal executive offices of TMC will be located at 595 Howe Street, 10th Floor, Vancouver, British Columbia, Canada V6C 2T5.

Competition

If SOAC succeeds in effecting the Business Combination with DeepGreen, there will be, in all likelihood, significant competition from their competitors. SOAC cannot assure you that, subsequent to the Business Combination, SOAC will have the resources or ability to compete effectively.

Periodic Reporting and Audited Financial Statements

SOAC has registered its securities under the Exchange Act and has reporting obligations, including the requirement to file annual and quarterly reports with the SEC. In accordance with the requirements of the Exchange Act, SOAC's annual reports contain financial statements audited and reported on by SOAC's independent registered public accounting firm.

SOAC is required to evaluate SOAC's internal control procedures as required by the Sarbanes-Oxley Act. Only in the event SOAC is deemed to be a large accelerated filer or an accelerated filer and no longer qualify as an emerging growth company, will SOAC be required to comply with the independent registered public accounting firm attestation requirement on SOAC's internal control over financial reporting. The fact that SOAC is a blank check company makes compliance with the requirements of the Sarbanes-Oxley Act particularly burdensome on SOAC as compared to other public companies because a target business with which SOAC seek to complete SOAC's initial business combination may not be in compliance with the provisions of the Sarbanes-Oxley Act regarding adequacy of its internal controls. The development of the internal controls of any such entity to achieve compliance with the Sarbanes-Oxley Act may increase the time and costs necessary to complete any such acquisition.

SOAC is a Cayman Islands exempted company limited by shares. Exempted companies are Cayman Islands companies conducting business mainly outside the Cayman Islands and, as such, are exempted from complying with certain provisions of the Cayman Islands Companies Law. As an exempted company, SOAC applied for and received a tax exemption undertaking from the Cayman Islands government that, in accordance with Section 6 of the Tax Concessions Law (2018 Revision) of the Cayman Islands, for a period of 20 years from the date of the undertaking, no law which is enacted in the Cayman Islands imposing any tax to be levied on profits, income, gains or appreciations will apply to us or SOAC's operations and, in addition, that no tax to be levied on profits, income, gains or appreciations or which is in the nature of estate duty or inheritance tax will be payable (i) on or in respect of SOAC's shares, debentures or other obligations or (ii) by way of the withholding in whole or in part of a payment of dividend or other distribution of income or capital by us to SOAC's shareholders or a payment of principal or interest or other sums due under a debenture or other obligation of us.

SOAC is an "emerging growth company," as defined in Section 2(a) of the Securities Act, as modified by the JOBS Act. As such, SOAC is eligible to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act reduced disclosure obligations regarding executive compensation in SOAC's periodic reports and proxy statements, and exemptions from the requirements of holding a non-binding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. If some investors find SOAC's securities less attractive as a result, there may be a less active trading market for SOAC's securities and the prices of SOAC's securities may be more volatile.

In addition, Section 107 of the JOBS Act also provides that an "emerging growth company" can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. In other words, an "emerging growth company" can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. SOAC intends to take advantage of the benefits of this extended transition period.

SOAC will remain an emerging growth company until the earlier of (i) the last day of the fiscal year (a) following the fifth anniversary of the completion of SOAC's initial public offering, (b) in which SOAC has a total annual gross revenue of at least $1.0 billion, or (c) in which SOAC is deemed to be a large accelerated filer, which means the market value of SOAC's Class A ordinary shares that are held by non-affiliates exceeds $700 million as of the prior June 30th and (ii) the date on which SOAC has issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Additionally, SOAC is a "smaller reporting company" as defined in Item 10(f)(1) of Regulation S-K. Smaller reporting companies may take advantage of certain reduced disclosure obligations, including, among other things, providing only two years of audited financial statements. SOAC will remain a smaller reporting company until the last day of the fiscal year in which (i) the market value of SOAC's ordinary shares held by non-affiliates exceeds $250 million as of the prior June 30 or (ii) SOAC's annual revenues exceeded $100 million during such completed fiscal year and the market value of SOAC's ordinary shares held by non-affiliates exceeds $700 million as of the prior June 30.

SOAC'S MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

References to the "Company," "Sustainable Opportunities Acquisition Corp.," "our," "us" or "we" refer to Sustainable Opportunities Acquisition Corp. The following discussion and analysis of the Company's financial condition and results of operations should be read in conjunction with the financial statements and the notes thereto contained elsewhere in this registration statement. Certain information contained in the discussion and analysis set forth below includes forward-looking statements that involve risks and uncertainties.

Overview

We are a blank check company incorporated as a Cayman Islands exempted company limited by shares on December 18, 2019 for the purpose of effecting the Business Combination. Although we are not limited to a particular industry or geographic region for purposes of consummating a Business Combination, we intend to focus within industries that benefit from strong Environmental, Social and Governance ("ESG") profiles. While investing in ESG covers a broad range of themes, we are focused on evaluating suitable targets that have existing environmental sustainability practices or that may benefit, both operationally and economically, from our management team's commitment and expertise in executing such practices.

The registration statement for our initial public offering was declared effective on May 5, 2020. On May 8, 2020, we consummated our initial public offering of 30,000,000 units at $10.00 per unit, generating gross proceeds of $300 million, and incurring offering costs of approximately $17.4 million, inclusive of $10.5 million in deferred underwriting commissions.

Simultaneously with the closing of the initial public offering, we consummated the private placement of 9,500,000 Private Placement Warrants at a price of $1.00 per Private Placement Warrant in a private placement to our Sponsor, generating gross proceeds of $9.5 million.

Upon the closing of the initial public offering and the private placement, $300 million ($10.00 per unit) of the net proceeds of the sale of the units in the initial public offering and the private placement were placed in a trust account, located in the United States at J.P. Morgan Chase Bank, N.A., with Continental Stock Transfer & Trust Company acting as trustee, and invested only in U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by us meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of the Investment Company Act, as determined by us, until the earlier of: (i) the completion of a Business Combination and (ii) the distribution of the trust account as described below. Our management has broad discretion with respect to the specific application of the net proceeds of the initial public offering and the sale of Private Placement Warrants, although substantially all of the net proceeds are intended to be applied generally toward consummating a Business Combination.

If we are unable to complete a Business Combination within the Combination Period, we will: (i) cease all operations except for the purpose of winding up; (ii) as promptly as reasonably possible but not more than ten business days thereafter, redeem the public shares, at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the trust account, including interest earned on the funds held in the trust account and not previously released to us to pay for our tax obligations, if any (less up to $100,000 of interest to pay dissolution expenses) divided by the number of the then-outstanding public shares, which redemption will completely extinguish public shareholders' rights as shareholders (including the right to receive further liquidation distributions, if any); and (iii) as promptly as reasonably possible following such redemption, subject to the approval of the remaining shareholders and our board of directors, liquidate and dissolve, subject in the case of clauses (ii) and (iii), to our obligations under Cayman Islands law to provide for claims of creditors and the requirements of other applicable law.

Proposed Business Combination

On March 4, 2021, we entered into the Business Combination Agreement, by and among the Company, NewCo Sub, and DeepGreen.

Pursuant to the Business Combination Agreement, we will undergo the Continuance. Following the Continuance, pursuant to the Plan of Arrangement under the *Business Corporations Act* (British Columbia), (i) we will acquire all of the issued and outstanding DeepGreen Common Shares, (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares or DeepGreen Options, as applicable, the following shares or options to purchase the following shares: an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the effective time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of the Company, and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement and the Plan of Arrangement and in accordance with the provisions of applicable law. See the Company's Current Report on Form 8-K, filed with the SEC on March 4, 2021, for further information.

Results of Operations

Our entire activity from December 18, 2019 (inception) through December 31, 2020, was in preparation for our initial public offering, and since such offering, our activity has been limited to the search for a prospective initial Business Combination. We will not generate any operating revenues until the closing and completion of our initial Business Combination.

We recognize non-cash gains and losses within other income (expense) related to changes in recurring fair value measurement of our warrant liabilities at each reporting period. The activity below reflects the results after considering the restatement of our historical financial statements to account for the Warrants within liabilities as further described in our financial statements.

For the year ended December 31, 2020, we had a net loss of approximately $36,542,055, which consisted of general and administrative expenses of approximately $2,923,654, changes in fair value of warrant liabilities of $32,730,000, offering costs allocated to warrant liabilities of $877,647, general and administrative- related party expenses of approximately $80,000, offset by approximately $69,246 in interest income and in the trust account.

For the period from December 18, 2019 (inception) to December 31, 2019, we had a net loss of approximately $9,000, which consisted solely of general and administrative expenses of approximately $9,000.

For the three months ended March 31, 2021, we had net income of $31,869,620, which consisted primarily of $34,880,000 related to the change in the fair value of the Company's Warrants partially offset by $3,014,922 of general and administrative expenses.

For the three months ended March 31, 2020, we had net loss of approximately $59,000, which consisted solely of general and administrative expenses.

Going Concern Consideration

As of December 31, 2020, we had approximately $1.3 million in cash and a working capital deficit of approximately $372,000.

As of March 31, 2021, we had approximately $1.2 million in cash and a working capital deficit of approximately $3.4 million.

Until the consummation of a Business Combination, we will be using the funds not held in the trust account for identifying and evaluating prospective acquisition candidates, performing due diligence on prospective target businesses, paying for travel expenditures, selecting the target business to acquire, and structuring, negotiating and consummating the Business Combination. We will need to raise additional capital through loans or additional investments from our Sponsor, shareholders, officers, directors, or third parties. Our officers, directors and Sponsor may, but are not obligated to, loan us funds, from time to time or at any time, in whatever amount they deem

reasonable in their sole discretion, to meet our working capital needs. Accordingly, we may not be able to obtain additional financing. If we are unable to raise additional capital, it may be required to take additional measures to conserve liquidity, which could include, but not necessarily be limited to, curtailing operations, suspending the pursuit of a potential transaction, and reducing overhead expenses. We cannot provide any assurance that new financing will be available to it on commercially acceptable terms, if at all. These conditions raise substantial doubt about our ability to continue as a going concern through November 8, 2021. These financial statements do not include any adjustments relating to the recovery of the recorded assets or the classification of the liabilities that might be necessary should we be unable to continue as a going concern.

We continue to evaluate the impact of the COVID-19 pandemic and have concluded that the specific impact is not readily determinable as of the date of the balance sheet. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Other Contractual Obligations

Underwriting Agreement

The underwriter was entitled to an underwriting discount of $0.20 per unit, or $6.0 million in the aggregate paid upon the closing of the initial public offering. In addition, $0.35 per unit, or $10.5 million in the aggregate will be payable to the underwriter for deferred underwriting commissions. The deferred underwriting commissions will become payable to the underwriter from the amounts held in the trust account solely in the event that we complete a Business Combination, subject to the terms of the underwriting agreement.

Administrative Support Agreement

We entered into an agreement, commencing on May 8, 2020 through the earlier of our consummation of a Business Combination and our liquidation, to reimburse our Sponsor a total of $10,000 per month for office space, secretarial and administrative services. We incurred and paid $80,000 and $0 in expenses in connection with such services and recorded in general and administrative expenses in the statements of operations for the year ended December 31, 2020, and for the period December 18, 2019 (inception) to December 31, 2019 respectively. We incurred and paid $30,000 and $0 in expenses in connection with such services and recorded in general and administrative expenses in the statements of operations for the three months ended March 31, 2021, and 2020, respectively.

Consulting Agreement

We are receiving consulting services in connection with identification of potential targets for a Business Combination and due diligence on such targets. As compensation for such services, we have paid a nonrefundable fixed fee of $350,000 and agreed to pay the consulting firm $2,650,000 solely in the event that we complete a Business Combination. The consulting agreement may be terminated early by either party to the agreement provided that we pay a termination fee to the consulting firm determined based on a monthly increasing amount through November 2021. As of December 31, 2020, the termination fee is $1,115,800, which has been accrued and recognized in general and administrative expenses within the statements of operations. The Company recognized $418,000 and $0 in general and administrative expenses within the statements of operations for the three months ended March 31, 2021 and March 31, 2020, respectively. The termination fee accrued was $1,533,800 as of March 31, 2021.

Critical Accounting Policies and Estimates

The preparation of financial statements and related disclosures in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements, and income and expenses during the periods reported. Actual results could materially differ from those estimates. The Company has identified the following as its critical accounting policies:

Class A Ordinary Shares Subject to Possible Redemption

Class A ordinary shares subject to mandatory redemption (if any) are classified as liability instruments and are measured at fair value. Conditionally redeemable Class A ordinary shares (including Class A ordinary shares that feature redemption rights that are either within the control of the holder or subject to redemption upon the occurrence

of uncertain events not solely within our control) are classified as temporary equity. At all other times, Class A ordinary shares are classified as shareholders' equity. Our Class A ordinary shares feature certain redemption rights that are considered to be outside of our control and subject to occurrence of uncertain future events. Accordingly, 30,000,000 Class A ordinary shares subject to possible redemption were presented at redemption value as temporary equity, outside of the shareholders' equity section of our balance sheet as of March 31, 2021.

Warrant Liabilities

We do not use derivative instruments to hedge exposures to cash flow, market or foreign currency risks. We evaluate all of our financial instruments, including issued stock purchase warrants, to determine if such instruments are derivatives or contain features that qualify as embedded derivatives, pursuant to ASC 480 and ASC 815-15. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period.

We issued an aggregate of 15,000,000 Public Warrants associated with Units issued to investors in our initial public offering and the underwriters' exercise of their overallotment option and we issued 9,500,000 Private Placement Warrants. All of our outstanding warrants are recognized as derivative liabilities in accordance with ASC 815-40. Accordingly, we recognize the warrant instruments as liabilities at fair value and adjust the instruments to fair value at each reporting period. The liabilities are subject to remeasurement at each balance sheet date until exercised, and any change in fair value is recognized in the Company's statement of operations. The fair value of warrants issued in connection with the initial public offering were measured at fair value using a Monte Carlo simulation and the private placement warrants were initially measured at fair value using a modified Black Scholes Model, including inputs from a Monte Carlo simulation. The private placement warrants have been valued similarly for each subsequent measurement date and fair value of warrants issued in connection with our initial public offering has subsequently been measured based on the listed market price of such warrants.

Net Income (Loss) Per Ordinary Share

We apply the two-class method in calculating earnings per share. Net income (loss) per share is computed by dividing net income (loss) by the weighted-average number of ordinary shares outstanding during the periods. An aggregate of 30,000,000 and 22,726,721 Class A ordinary shares subject to possible redemption at March 31, 2021 and December 31, 2020, respectively have been excluded from the calculation of basic income (loss) per ordinary share, since such shares, if redeemed, only participate in their pro rata share of the trust account earnings. We have not considered the effect of the warrants sold in the initial public offering and private placement to purchase an aggregate of 24,500,000 Class A ordinary shares in the calculation of diluted income (loss) per ordinary share, since the exercise of the warrants are contingent upon the occurrence of future events. As a result, diluted net income (loss) per ordinary share is the same as basic net income (loss) per ordinary share for the periods presented.

Recent Accounting Pronouncements

Management does not believe that any recently issued, but not yet effective, accounting pronouncements, if currently adopted, would have a material effect on the Company's financial statements.

Off-Balance Sheet Arrangements

As of March 31, 2021, we did not have any off-balance sheet arrangements as defined in Item 303(a)(4)(ii) of Regulation S-K and did not have any commitments or contractual obligations.

JOBS Act

On April 5, 2012, the JOBS Act was signed into law. The JOBS Act contains provisions that, among other things, relax certain reporting requirements for qualifying public companies. We will qualify as an "emerging growth company" and under the JOBS Act will be allowed to comply with new or revised accounting pronouncements based on the effective date for private (not publicly traded) companies. We are electing to delay the adoption of new or revised accounting standards, and as a result, we may not comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies. As such, our financial statements may not be comparable to companies that comply with public company effective dates.

Additionally, we are in the process of evaluating the benefits of relying on the other reduced reporting requirements provided by the JOBS Act. Subject to certain conditions set forth in the JOBS Act, if, as an "emerging growth company," we choose to rely on such exemptions we may not be required to, among other things, (i) provide an auditor's attestation report on our system of internal controls over financial reporting pursuant to Section 404, (ii) provide all of the compensation disclosure that may be required of non-emerging growth public companies under the Dodd-Frank Wall Street Reform and Consumer Protection Act, (iii) comply with any requirement that may be adopted by the PCAOB regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements (auditor discussion and analysis) and (iv) disclose certain executive compensation related items such as the correlation between executive compensation and performance and comparisons of the CEO's compensation to median employee compensation. These exemptions will apply for a period of five years following the completion of our initial public offering or until we are no longer an "emerging growth company," whichever is earlier.

INFORMATION ABOUT DEEPGREEN

As used herein, references to the "NORI Technical Report Summary" are to the NORI Technical Report Summary, prepared by AMC Consultants Ltd. ("AMC") for DeepGreen, dated March 2021, which was prepared in accordance with the requirements of subpart 1300 of Regulation S-K which governs disclosure for mining registrants (the "SEC Mining Rules"). References to the "TOML Technical Report Summary" are to the TOML Technical Report Summary, prepared by AMC for DeepGreen, dated March 2021, which was prepared in accordance with the SEC Mining Rules. The NORI Technical Report Summary and TOML Technical Report Summary are filed as Exhibit 96.1 and Exhibit 96.2, respectively, to the registration statement of which this proxy statement/prospectus forms a part. The mineral resource estimates contained in the NORI Technical Report Summary have an effective date of December 31, 2020 and have not been updated since that time. The mineral resource estimates contained in the TOML Technical Report Summary have an effective date of December 31, 2020 and have not been updated since such date.

Overview

DeepGreen is a deep-sea minerals exploration company focused on the collection, processing and refining of polymetallic nodules found on the seafloor of the CCZ. The CCZ is a zone of abyssal plains and other formations in the Eastern Pacific Ocean, with a length of around 4,500 miles (7,240 km) that spans approximately 4,500,000 square kilometers (1,700,000 sq mi). Polymetallic nodules, which are located in significant quantities on the seafloor of the CCZ, have high concentrations of nickel, manganese, cobalt and copper in a single rock. These metals are the main raw material inputs into lithium NMC (nickel-manganese-cobalt) battery cathodes and electric wiring often used in EV and energy storage. DeepGreen has identified the potential to recover metals from polymetallic nodules to support increasing demand from battery and electric vehicle production through the development of a process that produces metals from the polymetallic nodules with near-zero solid processing waste. As compared to land-based sources, polymetallic nodule collection has many advantages that allow DeepGreen to reduce the potential environmental and social impact of primary metal production, including the potential for up to a 90% reduction in climate change impacts, and a flow sheet that DeepGreen expects could lead to the substantial reduction or elimination of tailings. DeepGreen has a dual mission: (1) to supply metals for the clean energy transition with low environmental and social impact; and (2) to accelerate the transition to a circular metal economy. The primary application of DeepGreen's mission is to solve the metals supply problem for the manufacture of EV batteries.

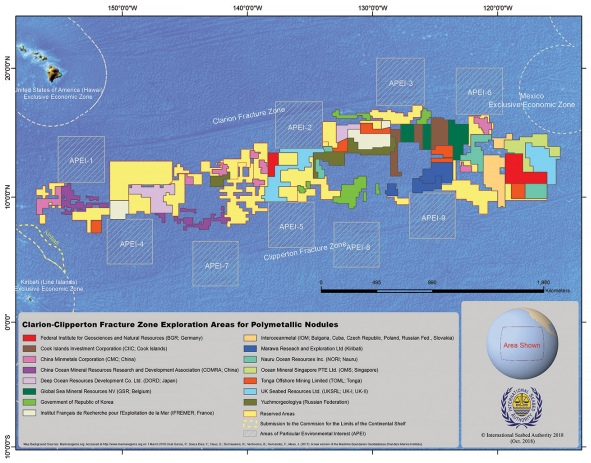
DeepGreen, through its subsidiaries, holds (directly or indirectly) exploration or commercial rights to three polymetallic nodule contract areas in the CCZ regulated by the ISA and sponsored by the Nation States of Nauru, Tonga and Kiribati, respectively. Based on the NORI Technical Report Summary and the TOML Technical Report Summary, the NORI Contract Area and TOML Contract Area, DeepGreen's current material mineral properties, represent an aggregate area of 149,543 km^2 and an estimated resource base of approximately 1.6 billion tonnes (wet) of polymetallic nodules. DeepGreen believes that the mineral resource in these two contract areas alone is the largest estimated single aggregated source of battery metals in the world, with enough estimated polymetallic nodules on the seafloor to support the electrification of approximately one quarter of the current global passenger vehicle fleet.

The ISA has issued a total of 16 polymetallic nodule exploration contracts in the CCZ covering 1.1 million km^2, or 0.3% of the global seafloor. Subsidiaries of DeepGreen hold direct or indirect rights to three out of these 16 exploration contracts:

NORI. Nauru Ocean Resources Inc. ("NORI"), a wholly-owned subsidiary of DeepGreen, holds exploration rights to four blocks (NORI Area A, B, C, and D, the "NORI Contract Area") covering 74,830 km^2 in the CCZ that were granted by the ISA in July 2011. NORI is sponsored by Nauru pursuant to a certificate of sponsorship signed by the Government of Nauru on April 11, 2011. The D block of the NORI area ("NORI Area D") is the seafloor parcel where DeepGreen has performed the most resource definition and environmental work to date. NORI commissioned AMC to undertake a preliminary economic assessment ("PEA") of the mineral resource contained in NORI Area D and to compile a Technical Report compliant with Canadian National Instrument (NI 43-101), which was completed in March 2021. AMC subsequently compiled the NORI Technical Report Summary, dated March 2021, which included an initial assessment and an economic analysis of NORI Area D prepared in accordance with the SEC Mining Rules. The NORI Technical Report Summary is filed as Exhibit 96.1 to the registration statement of which this proxy statement/prospectus forms a part.

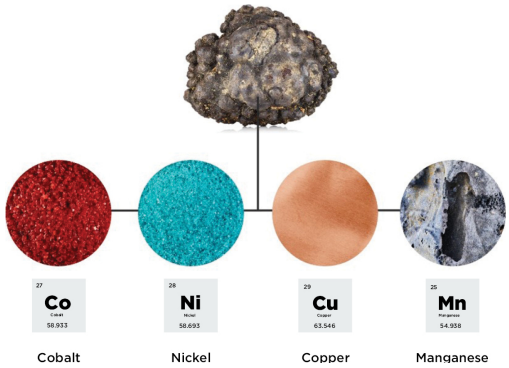
TOML. Tonga Offshore Mining Limited ("TOML"), a wholly-owned subsidiary of DeepGreen which was acquired by DeepGreen in March 2020, holds exploration rights to an area covering 74,713 km^2 in the CCZ that were granted by the ISA in January 2012 (the "TOML Contract Area"). On March 8, 2008, Tonga and TOML entered into a sponsorship agreement formalizing certain obligations of the parties in relation to TOML's exploration and potential exploitation of a proposed application to the ISA (subsequently granted) for the TOML Contract Area. TOML commissioned a Technical Report Summary by AMC, dated March 2021, which is filed as Exhibit 96.2 to the registration statement of which this proxy statement/prospectus forms a part.

Marawa. DGE, a wholly-owned subsidiary of DeepGreen, entered into agreements with Marawa Research and Exploration Ltd. ("Marawa") and the Republic of Kiribati ("Kiribati") which provide DGE with exclusive exploration rights to an area covering 74,990 km2 in the CCZ (the "Marawa Contract Area"). The exploration contract between Marawa and the ISA (the "Marawa Exploration Contract") was signed on January 19, 2015. To date, very limited offshore marine resource definition activities in the Marawa Contract Area have occurred and DeepGreen expects to commit future resources as contractually agreed with Marawa to evaluate the future commercial viability of any project in such area. DeepGreen has not completed adequate research to establish the economic viability of any project in the Marawa Contract Area. Further work will need to be conducted in order to assess the viability of any potential project in the Marawa Contract Area and such work will take several years until such assessment can be made.



The ISA was established in 1994 pursuant to the United Nations Convention on the Law of the Sea ("UNCLOS"). The ISA regulates the development of seabed resources in the Area beyond national jurisdiction. The ISA is in the process of finalizing regulations for the commercialization of operations in the Area, including those necessary for the collection of polymetallic nodules. The ISA was intending to have these regulations finalized by July 2020, but the COVID-19 pandemic disrupted ISA meetings and discussions. DeepGreen expects that the new exploitation regulations may be approved by the ISA within the next two years as the ISA's regular processes resume, or in the event that a member state notifies the ISA that a sponsored national intends to apply for approval of a plan of work for exploitation, the ISA is required complete the adoption of such rules regulations and procedures within two years of the request. The exploitation regulations will create the legal and technical framework for exploitation of the mineral resource in the NORI, TOML and Marawa Contract Area.

Polymetallic Nodules



Deep-ocean polymetallic nodules form on or just below the sediment-covered abyssal plains of the ocean. These nodules contain significant amounts of metals, and their unique characteristic compared to terrestrial deposits is the presence of multiple metals in one deposit. Additionally, polymetallic nodules in the CCZ possess a select number of key defining features such as:

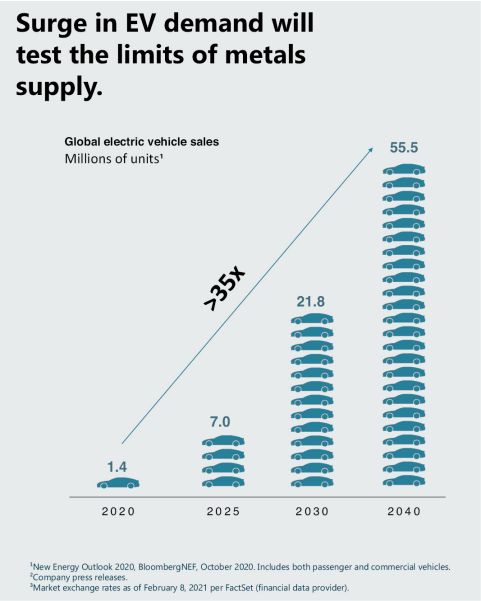
- far removed from human communities — no need for social displacement;
- unattached to the seafloor — no need for drilling and blasting;
- high-grades of four metals (nickel, copper, cobalt and manganese) in a single source — much less mass to process;
- very low hazardous elements like arsenic, antimony and mercury — which with the processing flow sheet contemplated by DeepGreen would result in no toxic processing tailings;
- low head-grade variability — easy to process;
- 2-10 cm diameter — easy to handle; and
- microporous — easy to smelt.

Market Opportunity

Battery Metals and EV Market Opportunity

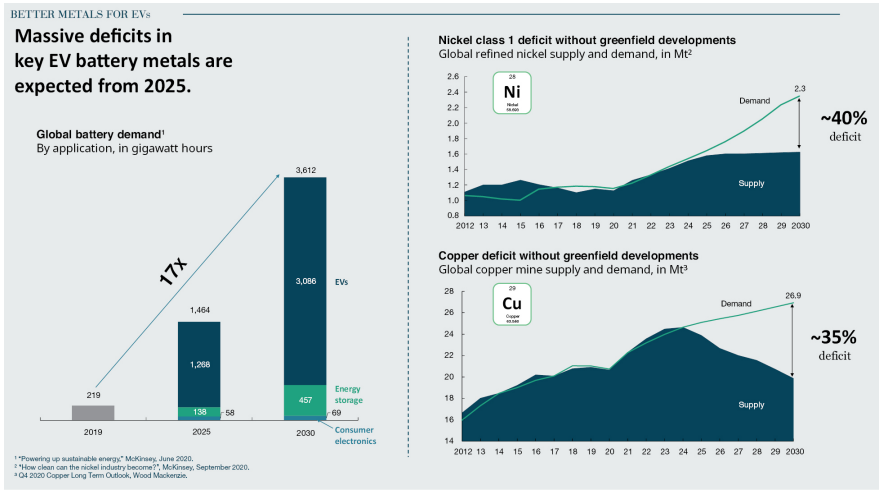
Significant growth in EV demand is now widely expected, with many countries committing to phasing out cars that burn fossil fuels and many original equipment manufacturers ("OEMs") devoting significant resources to the electrification of their vehicle offerings. This transition to EVs will test the limits of the supply of certain metals where EVs require several times more of certain metals (such as nickel and cobalt) than cars with internal combustion engines.

The urgent transition away from fossil fuels is driving a very significant, transitional demand for base metals. While only 1.4 million EVs were sold globally in 2020, that number is expected to grow over 15 times to 21.8 million EVs annually by 2030 and then further accelerate to 55.5 million vehicles by 2040. The surge in electric vehicle demand is supported by shifting consumer preferences, technology advancements and government legislation.



There has been unprecedented capital allocation towards the development and commercialization of EVs. Eight of the leading OEMs have announced more than $200 billion of capital for EV development. In addition to internal combustion engine ("ICE") OEMs and EV pioneers, in the last year alone, approximately $20 billion of capital was raised through SPAC mergers to support the development and commercialization of EVs. In addition to corporate investment, many national and regional regulatory bodies have adopted legislation to incentivize or require a shift to lower-emission and zero-emission vehicles. For example, China, the United Kingdom, Sweden, Germany, and France have announced plans to either increase applicable environmental targets or outright ban the sale of new ICE vehicles by 2030 or 2040. More recently, California passed regulations requiring half of the trucks sold in the state to be zero-emissions by 2035 and 100% by 2045.

Given the importance of battery metals such as nickel, manganese, cobalt and copper as critical components in the anticipated global development and commercialization of EVs, demand is expected to outpace supply and create a shortage in the coming years. By 2030, global battery demand is expected to reach 3,612 GWh, or 17 times greater than demand in 2019. The EV market is expected to drive approximately 85% of this demand. The remaining demand is comprised of energy storage applications (13%) and consumer electronics (2%).



Given the projected growth in global demand for large-scale lithium-ion batteries in connection with the EV transition, the current supply of battery metals such as nickel and copper is expected to be insufficient, with shortages projected to emerge by 2024. If no new greenfield developments are added to the pipeline, existing mining operations are predicted to fall short of meeting increased demand, and could result in a deficit of up to 40% in the supply of Class 1 nickel and up to 35% in the supply of copper.

Environmental Market Opportunity

Hundreds of millions of tons of nickel, cobalt, manganese and copper are required for the electrification of the global passenger fleet, and DeepGreen believes there is a critical need to ensure that these large amounts of base metals are sourced with the lowest environmental, social, and economic impacts possible. As the global supply of high-grade ore remains limited and metal demand increases, we can expect a larger environmental footprint as well as potential increases in metal prices should land-based mining remain the only viable method of collection. A 2021 study by the International Energy Agency shows that the production of minerals could increase by 600% by 2040 to meet the growing demand for clean energy technologies required to keep global warming at 1.5°C. DeepGreen expects that a growing global population, rising standards of living, higher penetration of intermittent renewable energy and increased commitments to carbon neutrality will contribute to high demand for battery metals. All base metals going into EV batteries today are produced from land-based ores. However, the land mining sector is fundamentally challenged — ore grades are falling, production is moving to some of the more biodiverse and conflict-laden regions in the world (such as DRC, Indonesia, and South Africa), and accessing ore bodies often requires a complete removal of ecosystems situated on and above such orebodies, and removing, breaking or tunneling through significant tonnage of waste rock. Toxic levels of heavy elements often found in land ore bodies often need to be removed, stored, and maintained indefinitely — a real challenge on seismically active and wet tropical islands in countries like Indonesia that is expected to account for most of future growth in nickel supply. While some market proponents have recently announced opposition to acquiring metals derived from deep-sea ore bodies on environmental grounds, DeepGreen believes that deep-sea mineral production presents significant net aggregated environmental and social benefits compared to production of similar metals from land based resource deposits.

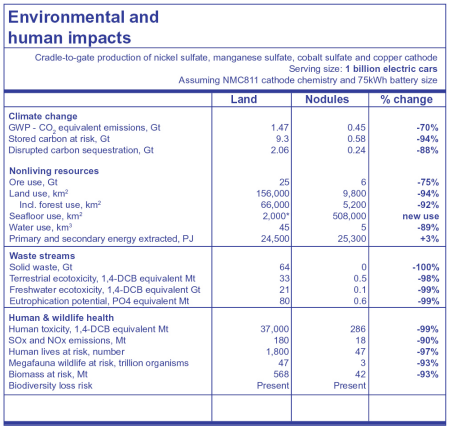
DeepGreen believes that sourcing such a large transitional demand of base metals from polymetallic nodules provides an opportunity to dramatically compress most lifecycle ESG impacts associated with conventional metal production from land-based ores. Producing metals from CCZ nodules can help avoid common ESG impacts with conventional metal production, such as child labor, deforestation, toxic tailings, and dramatically reduce other footprints like CO_2, sulphur oxide (SOx) and nitrogen oxide (NOx), water and land use.

Most of this compression is made possible by the unique properties of the polymetallic nodule resource and supported by production design choices made by DeepGreen. Polymetallic nodules sit unattached to the seafloor, with over 90% of nodule mass presenting in the top 5 cm unobstructed by overburden. This means that the nodules can be collected without the need for removing overburden to access the nodules or destructive rock cutting and excavation that is required on land. It also means that land use and deforestation caused by land-based mining can be avoided when collecting nodules. In order to extract nickel, copper, cobalt and manganese on land, at least three different types of ores would need to be excavated on land. Nodules contain rich concentrations of all four of these critical metals in a single rock, accounting for over one-third of nodule mass. This means that, on average, four times less ore needs to be processed to get at the same amount of metal if nodules are used as the source. Furthermore, unlike many land ores, nodules do not contain toxic levels of deleterious elements like arsenic and mercury — making it possible to productize 100% of nodule mass and leave no solid waste streams behind.

Nodule collection will also result in a new type of seafloor use in the CCZ abyssal plains. Some conventional projects producing metals from land ores do currently use the deep seafloor in the Coral Triangle and in the Atlantic Ocean for deposition of toxic tailings. If measured in terms of the used seafloor area (rather than the severity of impacts on the deep-sea ecosystems which are expected to be far more severe for deep-sea tailings placement), nodule collection will significantly increase the use of the seafloor. For context, it is also worth noting that if the entire CCZ area currently under exploration were to be exploited over a 30 year period, it would impact 40,000 km^2 of the abyssal seafloor per year. This is less than 1% of the estimated 4,900,000 km2 of the seafloor impacted every year by trawling.

The CCZ abyssal plains are one of the most common and least populated habitats on the planet, akin to barren deserts on land, and they on average support approximately 1,500 less biomass per km^2 than Indonesian rainforests (the number one nickel producer today). The CCZ abyssal seafloor is plant-free, food-poor and dominated by bacterial life forms. While it has been studied extensively since the 1960s and more research is underway, some level of uncertainty about the full inventory of local biodiversity will necessarily remain; as a result, entirely eliminating the risk of biodiversity loss is not feasible. The issue of biodiversity loss is also faced by conventional metal producers on land, with land-based mining featuring as a significant driver of biodiversity loss and deforestation today. As a precautionary environmental management and protection measure, the ISA has set aside 1.4 million km^2 of the CCZ as areas of particular environmental interest that will be preserved. As a result, more area in the CCZ is currently under protection than under exploration (1.4 million vs. 1.1 million km^2, respectively). Additional marine impact mitigation measures such as setting aside more areas and leaving partial nodule cover inside collection areas to aid natural recovery of bacterial and other communities are also being evaluated. DeepGreen is collaborating with certain of the world’s leading researchers to conduct environmental baseline and collection impact studies and to design plans that could further mitigate marine impacts of nodule collection through its collection system and adaptive management system.

To understand comparative ESG footprints of metal production from nodules as compared to conventional land ores, DeepGreen commissioned several lifecycle assessments (LCAs) looking at the cradle-to-gate impacts of producing nickel, copper, cobalt and manganese products for “1 billion EVs by 2050” scenario. An LCA white paper looking at a comprehensive set of impacts was reviewed by experts from Yale Center for Business and the Environment and published in April 2020 and an LCA research paper focusing on climate change impacts went through peer-review and was published in the Journal of Cleaner Production in December 2020. Based on these LCA assessments, DeepGreen believes that it is positioned to become one of the lowest ESG footprint metal companies in the industry, offering an expected 70-99% reduction of most lifecycle ESG impacts. While most of these reductions are attributable to the unique advantages of the polymetallic nodule resource as described above, the elimination of solid processing waste streams onshore is due to DeepGreen’s investment in zero-waste flowsheet design and the 70% reduction in Global Warming Potential of operations are due to DeepGreen’s commitment to locate its onshore processing facilities in places with access to renewable power.



Environmental and human impacts

Cradle-to-gate production of nickel sulfate, manganese sulfate, cobalt sulfate and copper cathode
Serving size: **1 billion electric cars**
Assuming NMC811 cathode chemistry and 75kWh battery size

	Land	Nodules	% change
Climate change			
GWP - CO_2 equivalent emissions, Gt	1.47	0.45	**-70%**
Stored carbon at risk, Gt	9.3	0.58	**-94%**
Disrupted carbon sequestration, Gt	2.06	0.24	**-88%**
Nonliving resources			
Ore use, Gt	25	6	**-75%**
Land use, km^2	156,000	9,800	**-94%**
Incl. forest use, km^2	66,000	5,200	**-92%**
Seafloor use, km^2	2,000*	508,000	**new use**
Water use, km^3	45	5	**-89%**
Primary and secondary energy extracted, PJ	24,500	25,300	**+3%**
Waste streams			
Solid waste, Gt	64	0	**-100%**
Terrestrial ecotoxicity, 1,4-DCB equivalent Mt	33	0.5	**-98%**
Freshwater ecotoxicity, 1,4-DCB equivalent Gt	21	0.1	**-99%**
Eutrophication potential, PO4 equivalent Mt	80	0.6	**-99%**
Human & wildlife health			
Human toxicity, 1,4-DCB equivalent Mt	37,000	286	**-99%**
SOx and NOx emissions, Mt	180	18	**-90%**
Human lives at risk, number	1,800	47	**-97%**
Megafauna wildlife at risk, trillion organisms	47	3	**-93%**
Biomass at risk, Mt	568	42	**-93%**
Biodiversity loss risk	Present	Present	

Competitive Strengths

For the following reasons, DeepGreen believes that it is well positioned to compete in the global marketplace for the collection and production of certain critical metal inputs of lithium NMC (nickel-manganese-cobalt) batteries and electric wiring often used in electric vehicles:

- *The world's largest estimated single aggregated source of battery materials* **—** DeepGreen, directly or indirectly, has the exploration rights to 224,533 km^2 of CCZ seafloor that host an estimated 1.6 billion (wet) ton nodule resource.
- *Low cost of production* — DeepGreen intends to become the second lowest-cost nickel producer in the world, and DeepGreen believes that it can achieve a negative cash cost for nickel as a result of being able to sell 100% of the byproducts created through the smelting and refining process.
- *Quality resource* — the polymetallic nodules that are to be collected are rich in valuable metals, containing high grades of copper, nickel, cobalt and manganese in a single rock.
- *Positive ESG impacts* — DeepGreen believes that its business model will result in significant ESG benefits compared to its on-land mining counterparts, and is expected to yield a 70 – 99% improvement in most lifecycle ESG impacts.
- *Best-in-class strategic partners* — DeepGreen's strategic partners, such as Allseas, Maersk and Glencore, are among the leaders in their respective fields, and DeepGreen believes that such relationships will allow DeepGreen to successfully pursue its asset-light model of development.
- *Highly qualified and knowledgeable management team* — DeepGreen is led by Gerard Barron, its Chief Executive Officer and Chairman who has a successful track-record as a serial company-builder (including battery manufacturing, telecoms and digital asset management technology) and as an investor in ocean resources; Dr. Greg Stone, its chief Ocean Scientist, who has over 30 years of experience in ocean research, conservation and policy, including approximately 10 years as Chief Scientist for Oceans at Conservation International; Erika Ilves, its Head of Strategy, who has over 15 years in strategy, including six years at McKinsey & Co.; and Anthony O'Sullivan, its Chief Development Officer, who has 30 years of experience in both land and ocean resource development projects, and was the former Head of Base Metals Exploration at BHP.

Business Strategy

DeepGreen's contemplated business spans the entire lifecycle of the polymetallic nodule from the resource acquisition and definition stage through the collection and transportation phases into the processing of nodules onshore and finally in product marketing and offtake. NORI and TOML, both subsidiaries of DeepGreen, intend to operate under the effective supervision, regulation and sponsorship of Nauru and Tonga, respectively, in the CCZ. DeepGreen intends to engage in processing operations in locations that have yet to be determined. DeepGreen has chosen an asset-light approach to its operations and has focused on forming deep strategic partnerships with leading offshore companies in every aspect of its operations.

DeepGreen's key strategic alliances include:

Allseas. Allseas, a leading global offshore contractor, is developing the pilot collection system for DeepGreen, which is expected to be modified into the initial smaller scale commercial production system and serve as the basis for the design of a full-scale commercial production system.

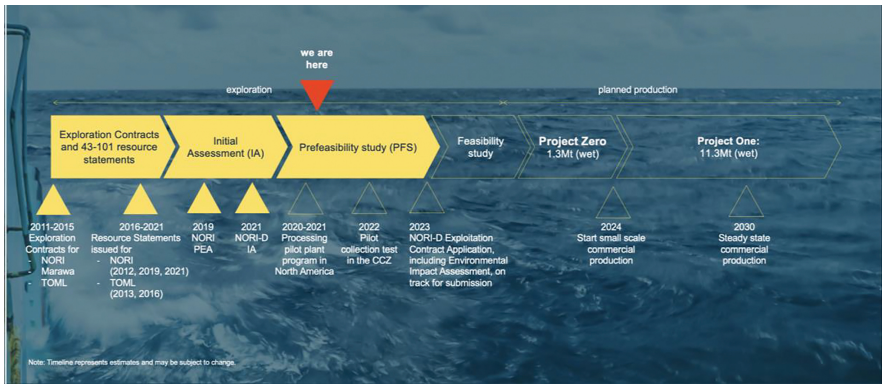
Maersk. Maersk Supply Service, a leading offshore marine service company, has provided DeepGreen with vessel operations and project management services for resource definition and environmental offshore campaigns in return for DeepGreen equity.

Glencore: Glencore holds offtake on 50% of the NORI nickel and copper production.

In addition, DeepGreen has worked with an engineering firm (Hatch) and consultants (KPM) to develop a zero solid waste flowsheet, which includes a pilot plant program which is being completed at FLSmidth's and Glencore's facilities. The zero solid waste flowsheet is the process design that is expected to serve as the basis for DeepGreen's onshore processing facilities.

NORI has planned a phased development for NORI Area D. Offshore collection systems, comprising collector vehicles on the seafloor, a riser and lift system ("RALS"), and a production support vessel, would collect polymetallic nodules. The nodules are expected to be transferred to transport vessels and shipped to on-shore processing facilities where established processing technology would be used to produce copper cathode, nickel sulphate and cobalt sulphate suitable for Li Ion battery cathode feedstock, nickel-copper-cobalt alloy, nickel matte, manganese silicate, and ammonium sulphate.

Through our strategic partnership with Allseas, a former oil and gas drilling vessel (the *Hidden Gem*) acquired by Allseas in February 2020 will be converted and modified to undertake a pre-production collector test in which a collector vehicle, RALS and other systems will be tested. The first phase of commercial production ("Project Zero") would then be expected to commence after the *Hidden Gem* has been upgraded to become a production support vessel that can produce up to 1.3 Mtpa (wet) of nodules. The nodules collected in Project Zero are expected to be processed through existing third-party facilities on a tolling basis. For the next phase of development ("Project One"), production is expected to be expanded with an additional converted drillship (*Drill Ship 2*), a second upgrade to the *Hidden Gem*, and the construction of a bespoke production support vessel (*Collector Ship 1*). Ultimately, DeepGreen expects that NORI will deploy a fleet of three production support vessels, each with a dedicated seafloor collection system that together would produce an average of ~12.5 Mtpa of wet nodules during steady state production. In Project One, DeepGreen expects to process a majority of nodules at a new facility that has not yet been constructed, with the balance of production going to toll treatment at an alternative facility. DeepGreen believes that this phased approach to development allows for management of risk and for progressive improvement of engineering and operating systems.



Currently, DeepGreen is in the prefeasibility study phase and expects to enter into the feasibility study phase in 2023 following completion of the pilot collection test in the CCZ. NORI plans to begin its pilot collection test 12 months after a collector test EIS is lodged with ISA. This lodgment is planned for June 2021.

Summary of Mineral Resources

Below is a summary table of estimated mineral resources. Further information can be found in the following sections: "*Properties — NORI Contract Area — Mineral Resource Estimates*" and "*Properties — TOML Contract Area — Mineral Resource Estimates*."

Summary Mineral Resources, In-Situ, at End of the Fiscal Year Ended December 31, 2020 at 4 kg/m^2 abundance cut-off and based on nickel metal $16,472/t; nickel in nickel sulfate $18,807/t Ni ; copper metal $6,872/t; cobalt metal $46,333/t; cobalt in cobalt sulfate $56,920/t Co; manganese in manganese silicate $4.50/dmtu Mn.

	Measured mineral resources		Indicated mineral resources		Measured + indicated mineral resources		Inferred mineral resources	
	Million tonnes (wet)	Grades (%)	Million tonnes (wet)	Grades (%)	Million tonnes (wet)	Grades (%)	Million tonnes (wet)	Grades (%)
Ni								
NORI								
NORI Area A							72	1.35
NORI Area B							36	1.43
NORI Area C							402	1.26
NORI Area D	4	1.42	341	1.40	345	1.40	11	1.38
TOML (Areas A to F)	2.6	1.33	69.6	1.35	72.2	1.35	696	1.29
Total	6.6	1.38	410.6	1.39	417.2	1.39	1217	1.29
Cu								
NORI								
NORI Area A							72	1.06
NORI Area B							36	1.13
NORI Area C							402	1.03
NORI Area D	4	1.16	341	1.14	345	1.14	11	1.14
TOML (Areas A to F)	2.6	1.05	69.6	1.18	72.2	1.18	696	1.14
Total	6.6	1.12	410.6	1.15	417.2	1.15	1217	1.10
Co								
NORI								
NORI Area A							72	0.22
NORI Area B							36	0.25

	Measured mineral resources		Indicated mineral resources		Measured + indicated mineral resources		Inferred mineral resources	
	Million tonnes (wet)	Grades (%)	Million tonnes (wet)	Grades (%)	Million tonnes (wet)	Grades (%)	Million tonnes (wet)	Grades (%)
NORI Area C							402	0.21
NORI Area D	4	0.13	341	0.14	345	0.14	11	0.12
TOML (Areas A to F)	2.6	0.23	69.6	0.21	72.2	0.21	696	0.20
Total	6.6	0.17	410.6	0.15	417.2	0.15	1217	0.21
Mn								
NORI								
NORI Area A							72	28.0
NORI Area B							36	28.9
NORI Area C							402	28.3
NORI Area D	4	32.2	341	31.2	345	31.2	11	31.0
TOML (Areas A to F)	2.6	27.6	69.6	30.3	72.2	30.2	402	29.0
Total	6.6	30.4	410.6	31.0	417.2	31.0	923	28.6

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w for NORI and 28% w/w for TOML. These estimates are presented on an undiluted basis without adjustment for resource recovery.

As reflected in the economic analysis of NORI Area D contained in the NORI Technical Report Summary, a discounted cash flow analysis, discounting at 9% per annum, indicates a NORI Area D project net present value (as of January 1, 2021) of $6.8 billion. The initial assessment included in the NORI Technical Report Summary is a conceptual study of the potential viability of NORI's mineral resources. This initial assessment indicates that development of the NORI mineral resource is potentially technically and economically viable; however, due to the preliminary nature of project planning and design, and the untested nature of the specific seafloor production systems at a commercial scale, economic viability has not yet been demonstrated.

The NORI Technical Report Summary and TOML Technical Report Summary do not include the conversion of mineral resources to mineral reserves.

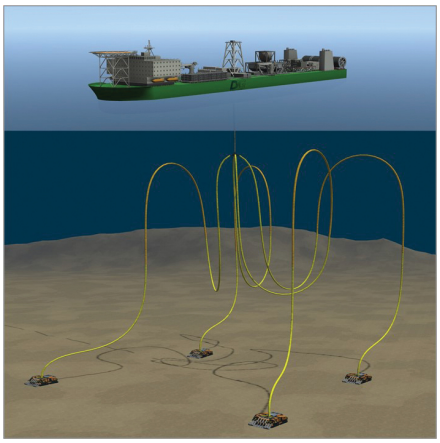
You are specifically cautioned not to assume that any part or all of the mineral deposits in these categories will ever be converted into mineral reserves, as defined by the SEC. You are also cautioned that mineral resources do not have demonstrated economic value. Inferred mineral resources have a high degree of uncertainty as to their existence and to whether they can be economically or legally commercialized. Under the SEC Mining Rules, estimates of inferred mineral resources may not form the basis of an economic analysis. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. A significant amount of exploration must be completed in order to determine whether an inferred mineral resource may be upgraded to a higher category. Therefore, you are cautioned not to assume that all or any part of an inferred mineral resource exists, that it can be economically or legally commercialized, or that it will ever be upgraded to a higher category. Approximately 97% of the NORI D Area resource is categorized as measured or indicated.

Likewise, you are cautioned not to assume that all or any part of measured or indicated mineral resources will ever be upgraded to mineral reserves.

Collection of Polymetallic Nodules and Processing

Collection and Shipping

The plan for the collection of polymetallic nodules includes offshore collection systems, which are comprised of collector vehicles on the seafloor, a riser and lift system, or RALS, and a production support vessel to collect the polymetallic nodules. The nodules would be expected to be collected from the seafloor by self-propelled, tracked collector vehicles. No rock cutting, digging, drill-and-blast or other breakage are expected to be required at the point of collection. The collectors would be remotely controlled and supplied with electric power via umbilical cables from the production support vessel.



The intended seafloor production system operated at 4km depth (picture not to scale)

Following collection by the production support vessel, the polymetallic nodules would be transferred to transport vessels and shipped to on-shore processing facilities to produce copper cathode, nickel sulfate and cobalt sulfate suitable for Li Ion battery cathode feedstock, a manganese silicate product and ammonium sulfate.

In order to test the collection system, a contract has been entered into with Allseas to undertake a pre-production collector test. If such test is successful, DeepGreen expects that commercial production would then commence after the upgrading of the *Hidden Gem* to produce a production support vessel that can produce 1.3 Mtpa (wet) of polymetallic nodules (Project Zero). Subsequent production expansions (Project One) would be expected to involve an additional converted drill ship, a second upgrade to the *Hidden Gem*, and construction of a bespoke production support vessel. DeepGreen believes that a fleet of three production support vessels, each with a dedicated seafloor collection system, would be estimated to produce approximately 12.5 Mtpa of wet nodules, which DeepGreen intends to be processed, either at a new facility to be constructed by DeepGreen or potential processing partners, subject to available capital, or at third-party facilities pursuant to a toll treatment model.

DeepGreen believes that this phased approach to development allows for management of risk and for progressive improvement of engineering and operating systems. The intention to implement the project in multiple phases that will allow the seafloor collection systems to be tested and then polymetallic nodule production to be gradually ramped up. DeepGreen also believes that this approach will de-risk the project for a relatively low initial capital investment. Additionally, this phased development will allow for an adaptive approach to environmental management providing learning at small-scale which would be applied as the development increases scale.

Mineral Processing and Metallurgical Testing

Pyrometallurgical processing of polymetallic nodules has been extensively studied from the early 1970s until the present day and appears to have been the preferred process for many other nodule processing research groups. Many groups including Kennecott (now Rio Tinto), Inco (now Vale), Cuban/Bulgarian, German, Indian, Japanese and Korean teams have studied pyrometallurgical processing of nodules at a laboratory scale; Chinese teams have studied it at a pilot plant scale.

From an early stage, DeepGreen has recognized that chemical and mineral processing represents a key to potentially commercializing seafloor polymetallic nodules and to becoming a low-cost producer of nickel,

manganese, copper and cobalt products. Moreover, DeepGreen believes that there is a commercial advantage in positioning itself as a leader in the onshore processing of seafloor polymetallic nodules. Consequently, DeepGreen has been undertaking a process development program since 2011.

DeepGreen has been working with a leading global process engineering group Hatch, and a professional services firm, to develop pyrometallurgical onshore processing technologies for the production of battery metals from nodules. Hatch has developed a zero solid waste flowsheet and is overseeing a pilot plant program which is in the process of being completed at FLSmidth's and Glencore's facilities. Pursuant to an engineering and consulting services agreement, Hatch is assisting and advising DeepGreen during the development of the pilot test program and is analyzing and interpreting the testing results through reports provided by such test facilities. Based on the results of the pilot plant program, DeepGreen and Hatch expect to expand the scope of work between the parties, including the development or modification of a processing plant for the recovery of battery metals from the polymetallic nodules collected.

DeepGreen proposes that the processing of the polymetallic nodules from the NORI Contract Area would also be ramped up in phases. This plan includes toll treating polymetallic nodules at existing Rotary Kiln-Electric arc Furnace ("RKEF") plants, utilizing existing excess industry capacity. DeepGreen believes that there is significant interest to deploy underutilised RKEF plants which may have become stranded as a result of the Indonesian government nickel laterite ore export ban restricting supply of the nickel laterite feedstock that they currently utilize. These RKEF plants were originally built to convert nickel laterite to nickel pig iron and could potentially be converted to smelt polymetallic nodules. While DeepGreen has not negotiated any definitive agreements with RKEF plants, DeepGreen believes that it may be able to do so in the future on commercially reasonable terms. In parallel, DeepGreen is actively exploring a scenario of co-locating new RKEF capacity with a potential future offtaker of the manganese silicate product of DeepGreen.

In the future, based on the work performed by Hatch and subject to available capital, it is contemplated that DeepGreen shall construct a processing plant(s), which may include pyrometallurgical and hydrometallurgical circuits. Nodule production would be increased in phases by treatment in this new plant or plants.

Strategic Alliances and Key Commercial Agreements

Allseas Agreements

On March 29, 2019, DeepGreen and Allseas entered into a Strategic Alliance Agreement, which provides the foundation for DeepGreen and Allseas to conduct project development of an integrated offshore nodule collection system for DeepGreen's subsidiaries. As initially constituted, Allseas agreed to subscribe for (i) 6,666,667 DeepGreen Common Shares for a purchase price of $20,000,000 in cash (the "Subscription"), the entire amount of which was funded, and (ii) an additional 10,000,000 DeepGreen Common Shares in exchange for services rendered by Allseas in respect of the contemplated pilot mining test system (the "PMTS"), which would be designed and built by Allseas. The 10,000,000 shares would only be issued upon completion of the PMTS (the "Success Fee Shares"), along with an additional $30 million cash success fee that would be payable simultaneously therewith. The Strategic Alliance Agreement also contemplated that DeepGreen and Allseas would enter into other commercial arrangements following the successful completion of the PMTS.

On July 8, 2019, DeepGreen and Allseas entered into the Pilot Mining Test Agreement (the "PMTA"), which governed the terms, design specifications, procedures, and timetable under which Allseas agreed to complete the PMTS, and which agreement is intended to be used by NORI. The PMTA was subsequently amended on September 1, 2019, February 2, 2020, and March 4, 2021. The Strategic Alliance Agreement was also amended on March 4, 2021 (collectively with the PMTA amendment of the same date, the "Amendment"), which Amendment would take effect upon closing of the Business Combination. Pursuant to the Amendment, the cash fee payable pursuant to the PMTA was amended such that DeepGreen would pay to Allseas (i) $10,000,000 on June 30, 2021, (ii) $10,000,000 on the later of January 1, 2022 and such time that confirmation is received with respect to the successful collection of the North Sea test, and (iii) $10,000,000 upon successful completion of the PMTS. Pursuant

to the Amendment, except as provided therein, Allseas may not, without DeepGreen's prior written consent, terminate the Strategic Alliance Agreement or the PMTA before DeepGreen or its applicable affiliate receives an Exploitation Contract with the ISA.

Also on March 4, 2021, DeepGreen issued the Allseas Warrant to Allseas, which shall vest upon successful completion of the PMTS and become exercisable for 10,000,000 DeepGreen Common Shares (as it may be adjusted based on the formula described therein) at a purchase price of $0.01 per share, and which will become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with the terms of the Allseas Warrant. The Allseas Warrant was issued to Allseas in lieu of any future obligation to issue the Success Fee Shares. The Allseas Warrant shall vest only upon (and not before) the successful completion of the PMTS. The Warrant Credit Value shall be determined as of June 1, 2022 based on the closing trading price of the TMC Common Shares. In the event that the Warrant Credit Value is greater than $150,000,000, then on the vesting date of the Allseas Warrant, TMC shall receive a "credit" for the amount by which such Warrant Credit Value exceeds $150,000,000. TMC will be able to exchange such credit value for future goods and services from Allseas. No amount will be due or receivable under the Allseas Warrant if the Warrant Credit Value is under $150,000,000 on June 1, 2022. The Allseas Warrant shall expire on September 30, 2026.

Supply Agreements with Maersk and Maersk UK

On March 21, 2017, DeepGreen entered into four charter vessel agreements with Maersk and one charter vessel agreement with Maersk UK (together, the "Maersk Supply Agreements") pursuant to which Maersk and Maersk UK agreed to supply DeepGreen with vessels and offshore services for a total of five marine campaigns. By letter agreement on March 3, 2021, DeepGreen and Maersk agreed to extend the arrangement until 2022.

Pursuant to the Maersk Investment and Participation Agreement dated March 15, 2017 (the "Participation Agreement"), DeepGreen agreed, among other things, that in return for marine cruises and related project management services provided by Maersk and Maersk UK, DeepGreen will issue that number of DeepGreen common shares as is equal to the final cost of each marine cruise divided by $1.25 (subject to adjustment as described therein), upon completion of each marine cruise, and after agreement between the parties as to the calculation of the final cost to Maersk or Maersk UK for such cruise. As of March 2021, all unspent costs have now been agreed to be reimbursed in cash. Services valued at approximately $22.5 million have been delivered, with 17,982,123 shares issued to Maersk under the contract.

On March 3, 2021, DeepGreen entered into a letter agreement with Maersk and Maersk UK (the "Maersk Letter Agreement"), whereby Maersk and Maersk UK agreed to, among other matters, enter into certain commercial and other changes under the Participation Agreement. Pursuant to the Maersk Letter Agreement, Maersk irrevocably (i) waived certain pro rata participation rights that it may have under the Participation Agreement in connection with the Business Combination and contemplated PIPE transaction; (ii) acknowledged that all amounts owing to Maersk for services rendered through February 5, 2021 in the aggregate amount of $4.58 million had been satisfied by the issuance of 3,666,267 DeepGreen Common Shares at a price per share of $1.25; (iii) agreed that all final costs for services rendered from and after February 5, 2021 will be settled in cash, and that Maersk shall not be entitled to any further in-kind common share investment; and (iv) agreed to lower the charter vessel hire operational day rates.

As described herein, DeepGreen's agreement with Maersk is set to expire in 2022. With respect to Allseas, if the PMTS is successfully delivered, the PMTA will terminate by its terms in 2022, whereas the overarching SAA will remain in place. While Allseas and Maersk have communicated their intention to negotiate in good faith in order to extend the applicable arrangements, there are no guarantees that DeepGreen will be able to enter into new agreements on commercially reasonable terms, if at all. DeepGreen does not currently have a collection and transport agreement with Allseas for the conduct of commercial operations using Allseas technology or the

Hidden Gem, but principle terms have been considered in the Strategic Alliance Agreement and the parties intend to complete commercial negotiations in connection with such arrangement as soon as practicable. Nevertheless, no assurance can be given that definitive arrangements will be reached.

Offtake Agreements

On May 25, 2012, DeepGreen's wholly-owned subsidiary, DGE, and Glencore International AG ("Glencore"), entered into a copper off-take agreement and a separate nickel off-take agreement (together, the "Glencore Offtake Agreements"), pursuant to which Glencore has the right to purchase from DGE 50% of the annual quantity of copper material and 50% of the annual quantity of nickel material produced by DGE from ore derived from the NORI Contract Area at a metallurgical installation for processing owned by DGE. Pursuant to the Glencore Offtake Agreements, for London Metal Exchange ("LME") Codelco registered Grade "A" copper cathodes, the delivered price is the official LME Copper Grade "A" Cash Settlement quotation as published in the London Metal Bulletin averaged over the month of shipment or the following month at Glencore's choice, plus the official long-term contract premium as announced annually by Codelco, basis CIF Main European Ports (Rotterdam, the Netherlands). For LME Registered Primary Nickel, the delivered price is the official LME Primary Nickel Cash Settlement averaged over the month of shipping or the following month at Glencore's choice. For other copper-bearing material and other nickel-bearing material, the parties shall agree a price annually for the forthcoming calendar year on the basis of prevailing market prices for such copper products and such nickel products. The Glencore Offtake Agreements are for the life of the NORI Contract Area, and either party may terminate the agreement upon a material breach or insolvency of the other party. Glencore may also terminate either agreement by giving 12 months' prior written notice. The Glencore Offtake Agreements do not extend to other DeepGreen entities in the event other entities are the ultimate processing owners for metal products. The Glencore Offtake Agreements only apply with respect to metals processed and developed from the NORI license that are processed by a facility owned by DGE and do not apply to other projects (including for example Marawa or TOML). Concurrent with entering into the Glencore Offtake Agreements, Glencore made an equity investment of $5 million into DeepGreen.

Competition

Sixteen contractors currently hold ISA exploration leases to assess the value of polymetallic nodule fields for future extraction in the Area. The Government of India holds the only lease block in the Indian Ocean. Beijing Pioneer Hi-Tech Development Corporation sponsored by the government of China holds a lease block in the Western Pacific Ocean. In addition to the TOML contract sponsored by Tonga, and the NORI contract sponsored by Nauru, other leases are in the CCZ, including two contractors sponsored by China — China Minmetals Corporation and China Ocean Mineral Resources Research and Development Association (who has two leases) — while two lease blocks for UK Seabed Resources Limited are sponsored by the UK. Belgium sponsors Global Sea Mineral Resources; Kiribati sponsors Marawa (which has a partnership with DeepGreen); Germany sponsors Federal Institute for Geosciences and Natural Resources of Germany; France sponsors IFREMER; Japan sponsors Deep Ocean Resources Development Co. Limited; Jamaica sponsors Blue Minerals Jamaica Ltd, and the Russian Federation sponsors JSC Yuzhmorgeologiya. Other contractors, including Cook Islands Investment Corporation and Ocean Mineral Singapore Private Limited, are sponsored by their eponymous states. A coalition of six states, including Bulgaria, Cuba, Czech Republic, Poland, Russian Federation and Slovakia, sponsor Interoceanmetal Joint Organization. These contractors and any new entrants are potential competitors to DeepGreen, NORI, TOML and Marawa with respect to the collection of polymetallic nodules and the production of nickel, manganese, copper and cobalt products.

DeepGreen may be unable to compete successfully with other contractors, or other mineral resource companies that provide metals for the manufacture of batteries, or that produce large volumes of manganese as DeepGreen plans to do. The mining industry is competitive in all of its phases and we expect to face strong competition from other companies in connection with the production of battery metals and manganese. Many of these companies have greater financial resources and a longer operating history than DeepGreen. In addition, competition for exploration resources at all levels is very intense. Increased competition could adversely affect DeepGreen's ability to attract necessary capital funding for mineral exploration in the future.

Government Regulation

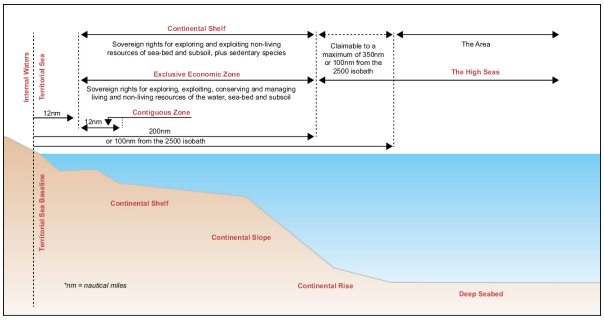
United Nations Convention on the Law of the Sea

The Area is defined as the seabed and subsoil beyond the limits of national jurisdiction (UNCLOS Article 1).

The principal policy documents governing the Area include:

- the United Nations Convention on the Law of the Sea, of 10 December 1982 ("UNCLOS"); and
- the 1994 Implementation Agreement.

UNCLOS deals with, among other things, navigational rights, territorial sea limits, exclusive economic zone jurisdiction, the continental shelf, freedom of the high seas, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits, conservation and management of living marine resources in the high seas, protection of the marine environment, marine scientific research, and settlement of disputes.



Part XI of UNCLOS and the 1994 Implementation Agreement deal with mineral exploration and collection in the Area, providing a framework for entities to obtain legal title to areas of the seafloor from the ISA for the purpose of exploration and eventually collection of resources. UNCLOS became effective on November 16, 1994. A subsequent agreement relating to the implementation of Part XI of UNCLOS was adopted on July 28, 1994 and became effective on July 28, 1996. The 1994 Implementation Agreement and Part XI of UNCLOS are to be interpreted and applied together as a single instrument. As of August 20, 2020, UNCLOS had been signed by 167 States (countries) and the European Union. The United States of America is currently not a party to UNCLOS, though US membership of the ISA does not have an impact on the enforceability or effectiveness of any rights granted to the Company through the ISA.

International Seabed Authority

The ISA is an autonomous international organization established under UNCLOS and the 1994 Implementation Agreement to organize and control activities in the Area, particularly with a view to administering and regulating the development of the resources of the Area in accordance with the legal regime established under UNCLOS and the 1994 Implementation Agreement. The ISA is comprised of 167 Member States, and the European Union. All parties to UNCLOS are members of the ISA. The ISA is mandated as the organization through which parties to UNCLOS shall organize and control all mineral-related activities in the Area. Two principal organs establish the policies and govern the work of ISA: the Assembly, where all 168 members are represented (the "Assembly"), and a 37-member council elected by the Assembly (the "Council"). The Council has two advisory bodies: the LTC (30 members), which advises the Council on all matters relating to the exploration and collection of non-living marine resources, such as polymetallic nodules, polymetallic sulfides and cobalt-rich ferromanganese crusts, and the Finance Committee (15 members), which deals with budgetary and related matters.

All rules, regulations, and procedures issued by the ISA to regulate prospecting, exploration, and collection of marine minerals in the Area are issued within a general legal framework established by UNCLOS and the 1994 Implementation Agreement. To date, the ISA has issued the following regulations (*https://www.isa.org.jm/mining-code/Regulations*):

- The Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted July 13, 2000, as amended in 2013; the Regulations).
- The Regulations on Prospecting and Exploration for Polymetallic Sulphides (adopted May 7, 2010).
- The Regulations on Prospecting and Exploration for Cobalt-Rich Ferromanganese Crusts in the Area (July 2012).

No polymetallic nodule collection operations have started anywhere in the world. Currently, exploration activities undertaken in the Area are aimed at gathering the necessary information on the location and quality of the minerals of the seabed as well as collecting all the necessary environmental information. To date, the ISA has approved 30 contracts for exploration involving 22 different countries and covering more than 1.35 million square kilometers of the seabed including areas outside of the CCZ. This represents 0.7 percent of the Area and 0.3 percent of the world's oceans. Twelve of these contracts are sponsored by developing countries (including the sponsors of our subsidiaries NORI — Nauru, and TOML — Tonga, and our partner Marawa which is sponsored by the Republic of Kiribati). Thirteen countries and one intergovernmental consortium currently have contracts for the exploration of polymetallic nodules, seven countries have contracts for the exploration of polymetallic sulphides, and five countries have contracts for the exploration of cobalt-rich ferromanganese crusts. The ISA is currently working on the development of a legal framework to regulate the commercialization of mineral development activities in the Area, as described below.

In 2014, the ISA completed a study looking at comparative extractive regulatory regimes. This was followed in March 2014 with a stakeholder survey seeking comments on what financial, environmental, and health and safety obligations should be included under the framework (ISA 2014).

In August 2017, the Council released the first Draft Regulations on Exploitation of Mineral Resources in the Area, as subsequently amended. In March 2019, the Council released the advance and unedited text (English only) of the Draft Regulations on Exploitation of Mineral Resources in the Area (ISBA/25/LTC/WP.1) (ISA, 2018). The revised draft exploitation regulations incorporated the consideration of requests addressed to the LTC by the Council during the first part of the 24th Session in March 2018, as well as certain comments by the Commission, and also reflected the responses to the first draft from stakeholder submissions. Finalization of the exploitation regulations remains subject to the decision of the members of the ISA. Final exploitation regulations must be adopted by the Council. ISA participants set an intention of July 2020 to have the regulations finalized; however, the July 2020 session was deferred as a result of the COVID-19 pandemic. DeepGreen expects that the final regulations may be approved within the next two years but there can be no assurance that such regulations will be approved then, or at all. Commercial nodule collection can only begin once an application for the ISA Exploitation Contract has been granted based on such final adopted exploitation regulations. The exploitation regulations will create the legal and technical framework for collection and related operations.

Pursuant to paragraph 15(a) and (b) of Section 1 of the annex to the 1994 Implementation Agreement, which relates to article 162(2)(o)(ii) of UNCLOS, the ISA Council must provisionally approve a plan of work within two years of a formal request being made by any State whose national contractor intends to apply for approval of a plan of work for collection.

The NORI Exploration Contract

In July 2011, DeepGreen's wholly-owned subsidiary, NORI, was granted a polymetallic nodule exploration contract by the ISA, providing it exclusive rights to explore 74,830 km^2 in the CCZ pursuant to the NORI Exploration Contract. The NORI Exploration Contract was approved by the Council on July 19, 2011, and entered into on July 22, 2011 between NORI and the ISA, and terminates on July 22, 2026, subject to extension.

The NORI Exploration Contract, which was granted pursuant to the ISA's Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (the "Regulations"), formalized a 74,830 km^2 exploration area, has an initial term of 15 years (subject to renewal for successive five-year periods), and provides for certain obligations

with respect to exploration, training, and other programs of activities for an initial five-year period. The NORI Exploration Contract also formalized the rights of NORI around future rights. Pursuant to the Regulations, NORI has the priority right to apply for an exploration contract to collect polymetallic nodules in the same area (Regulation 24(2)). Such preference or priority may be withdrawn by the Council if the contractor has failed to comply with the requirements of its approved plan of work for exploration within the time period specified in a written notice or notices from the Council to the contractor indicating which requirements have not been complied with by the contractor. After a hearing process, the Council would be required to provide the reasons for its proposed withdrawal of preference or priority and shall consider any contractor's response. The decision of the Council shall take account of that response and shall be based on substantial evidence. As soon as practicable, NORI intends to submit an application to collect polymetallic nodules in the same area as its current exploration rights.

In March 2016, NORI submitted to the ISA its proposed activities for the second five-year period of its exploration contract. NORI indicated that work during such period would focus on:

- reducing project uncertainties and technical risks;
- optimizing the onshore processing and offshore production systems (including increasing performance and reliability); and
- improving project economics, including decreasing estimated capital and operating expenditures as well as increasing projected revenues.

NORI proposed various activities under that submission, which have been undertaken and are continuing to be undertaken. Such work has included improving metal recovery from the hydrometallurgical process then being developed, including studies to improve efficiencies, reduce costs, and increase revenue streams. During the course of this second five-year period, the metallurgical process flow sheet was revised to result in perceived lower-risk and no solid waste, and a pyrometallurgical/hydrometallurgical flowsheet was developed. Studies have also been carried out to identify potential sites for the processing plant. A program of offshore campaigns has been and is in the process of being implemented, resulting in a comprehensive environmental baseline study program involving in excess of 100 separate studies and world leading researchers and institutions. This study is intended to inform NORI's ESIA and EMMP submissions to the ISA and assist in its design and plans to manage and mitigate potential environmental impacts from operations.

NORI commenced a pre-feasibility study to analyze technical and economic viability of the collection system and metallurgical process, and verified capital and operating costs to a greater accuracy.

NORI also proposed and has implemented or will implement a range of activities pertaining to the collector test: (i) identification and ground truthing of areas potentially suitable for the collector test; (ii) confirmation of a collector test site; (iii) commencement of the environmental baseline studies pertaining to the collector test environmental impact assessment ("EIA") programme; and (iv) commencing geotechnical studies pertaining to the collector test programme.

The ISA Council may suspend or terminate the NORI Exploration Contract, without prejudice to any other rights that the ISA may have, if any of the following events should occur:

- if, in spite of written warnings by the ISA, NORI has conducted its activities in such a way as to result in serious persistent and willful violations of the fundamental terms of the NORI Exploration Contract, Part XI of UNCLOS, the 1994 Agreement and the rules, regulations and procedures of the ISA;
- if NORI has failed to comply with a final binding decision of the dispute settlement body applicable to it; or
- if NORI becomes insolvent or commits an act of bankruptcy or enters into any agreement for composition with its creditors or goes into liquidation or receivership, whether compulsory or voluntary, or petitions or applies to any tribunal for the appointment of a receiver or a trustee or receiver for itself or commences any proceedings relating to itself under any bankruptcy, insolvency or readjustment of debt law, whether now or hereafter in effect, other than for the purpose of reconstruction.

Additionally, if the nationality or control of NORI changes or NORI's Sponsoring State, as defined in the Regulations, terminates its sponsorship and NORI does not obtain another sponsor meeting the requirements prescribed in the Regulations, then the NORI Exploration Contract will terminate.

The NORI Sponsorship Agreement

NORI is sponsored by Nauru pursuant to a certificate of sponsorship signed by the Government of Nauru on April 11, 2011. NORI is a Nauruan incorporated entity and is subject to applicable Nauruan legislation and regulations. In 2015, the Nauruan government established the NauruSeabed Minerals Authority to regulate activities carried out by companies sponsored by Nauru.

Throughout the period of the NORI Exploration Contract, NORI must be sponsored by a State that is party to UNCLOS. If the nationality or control of NORI changes or NORI's Sponsoring State, as defined in the Regulations, terminates its sponsorship, NORI must promptly notify the ISA. In either such event, if NORI does not obtain another sponsor meeting the requirements prescribed in the Regulations which submit to the ISA a certificate of sponsorship for NORI in the prescribed form within six months, the NORI Exploration Contract will terminate.

On June 5, 2017, Nauru, the Nauru Seabed Minerals Authority and NORI entered into a sponsorship agreement (the "NORI Sponsorship Agreement") formalizing certain obligations of the parties in relation to NORI's exploration and potential collection of the NORI Contract Area of the CCZ. The NORI Sponsorship Agreement will remain in force for the duration of the 15-year NORI Exploration Contract, and will automatically extend for a further 20 years upon NORI reaching the minimum recovery level under an ISA Exploration Contract, unless earlier terminated by the ISA as a result of NORI's breach of the NORI Exploration Contract or pursuant to its terms. Upon reaching the minimum recovery level within the tenement area, NORI will pay Nauru a seabed mineral recovery payment based on the polymetallic nodules recovered from the tenement area. In addition, NORI will pay an administration fee each year to Nauru for such administration and sponsorship, which is subject to review and increase in the event that NORI is granted an ISA exploitation contract.

During exploration, NORI is required to, among other things:

- submit an annual report to the ISA;
- meet certain performance and expenditure commitments;
- pay an annual overhead charge to cover the costs incurred by the ISA in administering and supervising the contract;
- implement training programs for personnel of the ISA and developing countries in accordance with a training program proposed by NORI in its license application;
- take measures to prevent, reduce, and control pollution and other hazards to the marine environment arising from its activities in the Area;
- maintain appropriate insurance policies;
- establish environmental baselines against which to assess the likely effects of its program of activities on the marine environment; and
- establish and implement a program to monitor and report on such effects.

In 2016, NORI submitted to the ISA proposed activities for the second five-year period of its exploration contract. NORI indicated that work during this second five-year period would focus on:

- reducing project uncertainties and technical risks;
- optimizing the on-shore processing and off-shore production systems (including increasing performance and reliability); and
- improving project economics, including decreasing estimated capital and operating expenditures as well as increasing projected revenues.

The TOML Exploration Contract

In March 2020, DeepGreen acquired TOML, a subsidiary of the former Nautilus Minerals Group, from Deep Sea Mining Finance Limited, providing DeepGreen with exclusive rights to explore a 74,713 km^2 block of the CCZ seabed. TOML holds an exploration contract granted by the ISA and sponsored by Tonga pursuant to the TOML Exploration Contract. The plan of work was approved by the Council, acting on the recommendation of the LTC, on July 19, 2011. The TOML Exploration Contract was then signed on January 11, 2012 between TOML and the ISA and terminates on January 11, 2027, subject to a potential extension under the terms of the agreement.

The TOML Exploration Contract was granted pursuant to the ISA's Regulations, as well as Article 153 of UNCLOS, and formalized a 74,713 km^2 exploration area. The TOML Exploration Contract includes an initial term of 15 years, which may be extended under the contract, and a program of activities to be completed within the first five-year period of the term. The TOML Exploration Contract also formalized the rights of TOML around future rights. Pursuant to the Regulations, TOML has the priority right to apply for an exploitation contract to collect polymetallic nodules in the same area (Regulation 24(2)). The Regulations state that a contractor who has an approved plan of work for exploration only shall have a preference and a priority among applicants submitting plans of work for collection of the same area and resources. Such preference or priority may be withdrawn by the Council if the contractor has failed to comply with the requirements of its approved plan of work for exploration within the time period specified in a written notice or notices from the Council to the contractor indicating which requirements have not been complied with by the contractor. After a hearing process, the Council shall provide the reasons for its proposed withdrawal of preference or priority and shall consider any contractor's response. The decision of the Council shall take account of that response and shall be based on substantial evidence.

In October 2016 TOML submitted to the ISA its proposed activities for the second five-year period of its exploration contract. TOML indicated that work would focus on:

- continued development and collection of environmental baseline data;
- completing pilot testing;
- completing geotechnical studies;
- completing feasibility studies;
- drafting of the first EIA/EMP; and
- continuing training.

Based on an expectation that the forthcoming environmental regulations pertaining to obtaining an exploitation contract were to be completed, TOML submitted a plan that included a substantive program of environmental baseline survey and pilot collection monitoring. It also included fabrication and trials of pilot scale collection equipment, metallurgical test work, and other engineering and marketing studies as well as report drafting for environmental permitting and feasibility study purposes. The designing of TOML's collection system called the Decoupled Underwater Collection Concept ("DUCC") did progress to prefeasibility study state. TOML continued to advance its project design by conducting land-based tests and closing technology gaps in areas not previously piloted. A preliminary collection plan and collection equipment/schedule was completed for the TOML preliminary collection areas, but such plans are now subject to change by TOML.

The ISA Council may suspend or terminate the TOML Exploration Contract, without prejudice to any other rights that the ISA may have, if any of the following events should occur:

- if, in spite of written warnings by the ISA, TOML has conducted its activities in such a way as to result in serious persistent and willful violations of the fundamental terms of this contract, Part XI of UNCLOS, the 1994 Agreement and the rules, regulations and procedures of the ISA;
- if TOML has failed to comply with a final binding decision of the dispute settlement body applicable to it; or
- if TOML becomes insolvent or commits an act of bankruptcy or enters into any agreement for composition with its creditors or goes into liquidation or receivership, whether compulsory or voluntary,

or petitions or applies to any tribunal for the appointment of a receiver or a trustee or receiver for itself or commences any proceedings relating to itself under any bankruptcy, insolvency or readjustment of debt law, whether now or hereafter in effect, other than for the purpose of reconstruction.

Additionally, if the nationality or control of TOML changes or TOML's Sponsoring State, as defined in the Regulations, terminates its sponsorship and TOML does not obtain another sponsor meeting the requirements prescribed in the Regulations, then the TOML Exploration Contract will terminate.

The TOML Sponsorship Agreement

On March 8, 2008, Tonga and TOML entered into a sponsorship agreement (the "TOML Sponsorship Agreement") formalizing certain obligations of the parties in relation to TOML's exploration and potential collection of a proposed application to the ISA (subsequently granted) known as the TOML Area. The initial term for the TOML Sponsorship Agreement is 30 years, unless earlier terminated, and the parties may agree to extend the initial term pursuant to the terms of the contract. Upon reaching the minimum recovery level within the tenement area, TOML has agreed to pay Tonga a seabed mineral recovery payment based on the polymetallic nodules recovered from the tenement area. In addition, TOML has agreed to pay the reasonable direct costs incurred by Tonga to administer the ISA obligations of Tonga to the ISA. TOML is currently negotiating a new Sponsorship Agreement with Tonga and expects that any such new agreement will be on substantially the same terms as the NORI Sponsorship Agreement.

Marawa Agreements

On March 17, 2012, DeepGreen's wholly-owned subsidiary, DGE, entered into an Option Agreement (the "Option Agreement") with Marawa and Kiribati. In consideration of the $250,000 option fee, Marawa granted DGE an option to purchase tenements, as may be granted to Marawa by the ISA or any other regulatory body, for $300,000, or in consideration of DGE waiving any loan and other debt obligation pursuant to the Services Agreement (as defined below), if a default event occurs. The exercise period for the Option is a maximum of 40 years after the date of the execution of the Option Agreement.

On July 26, 2012, the ISA Council approved a plan of work for exploration submitted by Marawa covering the Marawa Contract Area.

On October 1, 2013, DGE entered into an agreement (the "Services Agreement") with the Republic of Kiribati and Marawa granting DGE the exclusive right for 40 years to carry out exploration and collection in the Marawa Contract Area as well as purchase polymetallic nodules collected from the Marawa Contract Area. The Marawa Exploration Contract was signed on January 19, 2015. Mineral resource definition work began in 2020 for the Marawa Contract Area and we expect to continue undertaking such work in the near future.

DGE has the right to terminate the Services Agreement for convenience at any time at its election by giving written notice to Marawa and Kiribati and such termination shall take effect two months following the date of the termination notice, provided that DGE shall pay to the ISA on behalf of Marawa the fees or payments legally owed to the ISA by Marawa (including the Annual ISA Exploration Fee and ISA Royalties and Taxes) that are outstanding at the date of termination or that are incurred within 12 months of the date of such termination, provided that Marawa shall have an obligation to minimize such fees and payments to the extent practicable after the date of said termination. DGE and Marawa have considered the potential to amend the current contractual arrangements to provide additional mutual benefits in the conduct of operations, though no assurances may be given that any changes will be agreed.

Royalties and taxes

Royalties and taxes payable on any future production from the Area will be stipulated in the ISA's exploitation regulations. While the rates of payments are yet to be set by the ISA, the 1994 Implementation Agreement (Section 8(1)(b)) prescribes that the rates of payments "shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage."

An ad hoc ISA working group workshop has met several times including most recently in February 2020 to discuss a number of potential royalty and taxation regimes supported by modelling conducted by the Massachusetts Institute of Technology. No final recommendations were made. However, a 2% ad valorem royalty increasing to 6% after a period of five years of production was discussed as well as a 1% ad valorem environmental levy. Additional discussions have considered capping any proposed environmental levy once an agreed total value has been reached and might no longer be collected once sufficient funds are in trust. We cannot assure you that any such royalties or levies will not be greater than those discussed and could be significantly greater.

Environmental Regulation

The ISA is mandated through UNCLOS to "preserve and protect the marine environment" while developing the resources within CCZ. Given that the NORI Contract Area is in the Area, the ISA is responsible for assessing any environmental and social impact assessment ("ESIA") prepared by NORI and for granting the relevant permits. NORI is currently one of 16 contractors with a license to explore for polymetallic nodules in the CCZ (refer ISBA/23/C/7, 5 June 2017). Historically, a significant amount of technical work has been undertaken within the CCZ by such contractors and a significant body of information has been acquired during the past 40 years on the likely environmental impacts of collecting nodules from the sea floor. To date, no licenses for the commercial collection of polymetallic nodules within the CCZ have been granted by the ISA.

Between 1998 and 2019, the ISA held workshops and developed a number of documents to provide guidance to contractors with respect to its expectations for responsible environmental management during the exploration and collection phases of mineral development. Regulations for exploration have been established, and environmental standards and guidelines (together with environmental provisions in the Draft Regulations for Exploitation) to apply to operations are currently under development. The ISA held a workshop "towards an ISA environmental management strategy for the Area" in March 2017 in Berlin, Germany. The results of the workshop were published as ISA technical Study 17 (ISA 2017). The ISA has developed various Standards and Guidelines which are expected to be finalized and adopted by the Council when completed by the Legal and Technical Commission, and are expected to include standards concerning an environmental management and monitoring program that will be required by each contractor.

The ISA has issued Regulations on Prospecting and Exploration for Polymetallic Nodules (adopted on July 13, 2000, updated on July 25, 2013). The regulations were complemented by the LTC's recommendations for the guidance of contractors on assessing the environmental impacts of exploration. The draft exploitation regulations on deep-seabed collection were discussed at the 25th Session of the ISA in early 2020 in Kingston, Jamaica. The ISA is developing various Standards and Guidelines which are expected to be finalized by the Legal and Technical Commission and adopted by the Council, and are expected to include standards concerning the submission requirements for an ESIA that will be required by each contractor.

Although the environmental impact review process has not yet been finalized, all contractors have been made aware that the ISA requires the completion of baseline studies and EIA, culminating in an environmental impact statement ("EIS"), prior to collection. Guidance for contractors in terms of what will be expected in the EIS has been provided in ISA Technical Study No. 10 (ISA 2012a). The EIS, along with an EMMP, will be required as part of the application for an Exploitation Contract for operations in the contract Area. Environmental impacts of exploration and potential collection activities have been studied, and NORI is working with several of the deep-sea research institutions that are contributing to our environmental and social impact assessment program, consisting of over 100 discrete studies.

NORI's off-shore exploration campaigns have included sampling to support environmental studies, collection of high-resolution imagery, full column physical and chemical oceanographic data and environmental baseline studies. A number of future campaigns are planned to collect data on ocean currents and water quality to assist plume modelling, environmental baseline studies, box core and multicorer sampling focused on benthic ecology

and sediment characteristics. NORI intends to manage the project under the governance of an EMS, which is to be developed in accordance with the international EMS standard, ISO 14001:2004. The EMS will provide the overall framework for the environmental management and monitoring plans that will be required.

NORI's EMMP will specify the objectives and purpose of all monitoring requirements, the components to be monitored, frequency of monitoring, methods of monitoring, analysis required in each monitoring component, monitoring data management and reporting. The EMMP will be submitted to the ISA as part of the exploitation contract application.

Through a consultation process initiated by the ISA in 2013 and the feedback that was obtained from multiple stakeholder groups, the environmental permitting process is expected to involve a series of checks and balances with reviews being conducted by the ISA and LTC. The recommendations of these groups will then go before the ISA Council, which will then review and, if it deems appropriate, approve the exploitation application.

The sponsoring State has a responsibility to put in place legislation to ensure the entity it has sponsored complies with UNCLOS and ISA rules and regulations. Nauru implemented the Nauru International Seabed Minerals Act in 2015.

As of the date of this proxy statement/prospectus, DeepGreen believes, based on NORI's assessment that it is in compliance with existing exploration permits and contracts. NORI is in the middle stages of the exploitation permitting process. In addition to working on key engineering aspects of the project such as designing the nodule collector and the dewatering facility, NORI is also continuing the following tasks:

- delineating nodule mineralization;
- characterizing the nature of the seabed, water column and biology;
- conducting environmental baseline studies and impact assessments;
- characterizing the nature of any materials returned to the environment;
- developing oceanographic and physical information to inform models (e.g., sediment plume models); and
- developing other plans, including the EMMP and the various subordinate plans.

The potential future on-shore environmental impacts have not yet been assessed because the processing plant that DeepGreen expects to create or to partner with through a tolling or other arrangement has not been determined or otherwise has not been designed in detail, and the location and host country (and hence regulatory regime) has not been confirmed. The planned metallurgical process is not expected to generate solid waste products, and the deleterious elements (for example, cadmium and arsenic) content of the nodules is understood to be very low, indicating that with careful management, the environmental impacts of the processing operation could potentially be low.

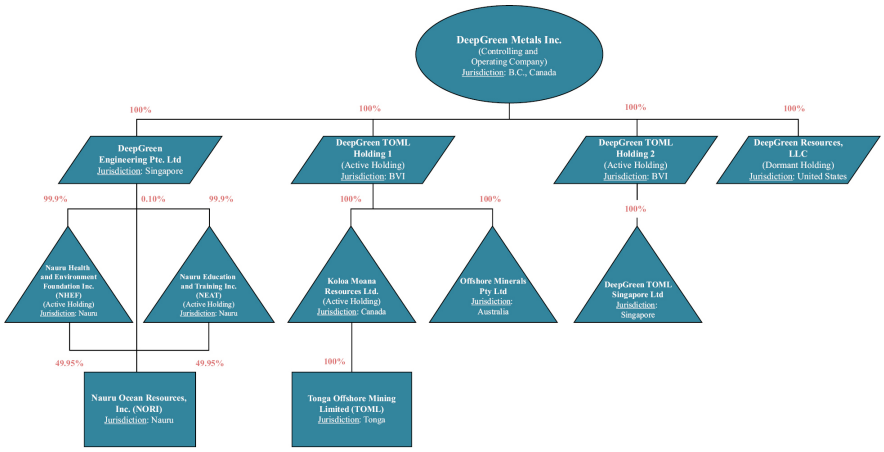
Intellectual Property

DeepGreen's success depends in part upon its ability to obtain and maintain patent protection of its core technology and intellectual property, as well as that of its strategic partners, and particularly that it maintains its freedom to operate not being restricted by patents lodged by others. DeepGreen maintains a portfolio of issued patents and pending patent applications, which relate to offshore collection systems and to the processing of polymetallic nodules for recovering metals. As DeepGreen relies on a number of patents to establish and protect its intellectual property, it has obtained and filed patent applications in countries throughout North America, Europe and Asia.

DeepGreen cannot conclusively state that any pending applications, existing patents or future patents will be definitively useful in protecting or promoting DeepGreen's business and growth plans. In addition, DeepGreen cannot guarantee that it will be able to obtain trademark protection of the name, "The Metals Company" once the Business Combination is complete. Please see the section entitled "*Risk Factors*" for additional information on the risks associated with DeepGreen's intellectual property strategy and portfolio.

Corporate Information

Founded in 2011, DeepGreen is a corporation existing under the laws of British Columbia, Canada. DeepGreen's registered office is currently located at 595 Howe Street, 10th Floor, Vancouver, British Columbia, Canada V6C 2T5, and its telephone number is: (604) 631-3115. Upon the closing of the Business Combination, the location of the registered office of TMC will be those of DeepGreen. The following chart illustrates our simplified corporate structure as of the date of this proxy statement/prospectus.



Legal Proceedings

From time to time, DeepGreen may become involved in legal proceedings or be subject to claims arising in the ordinary course of its business. There is no material litigation, arbitration or governmental proceeding or any other legal proceeding currently pending or to DeepGreen's knowledge, threatened against DeepGreen or any members of DeepGreen's management team in their capacity as such.

Employees

DeepGreen has approximately twenty-four (24) employees and contractors. As of April 1, 2021, five of DeepGreen's staff were located in the United States, two were located in Canada, eight were located in Australia, one was located in each of Nauru and Tonga, and the rest were located in Europe and the UAE. None of DeepGreen's staff are represented by a labor union or subject to a collective bargaining agreement.

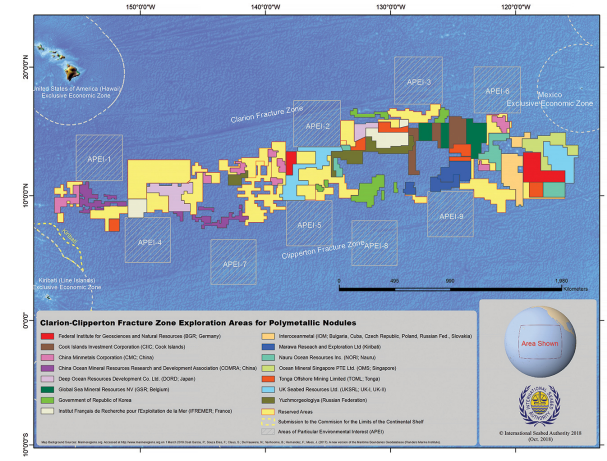
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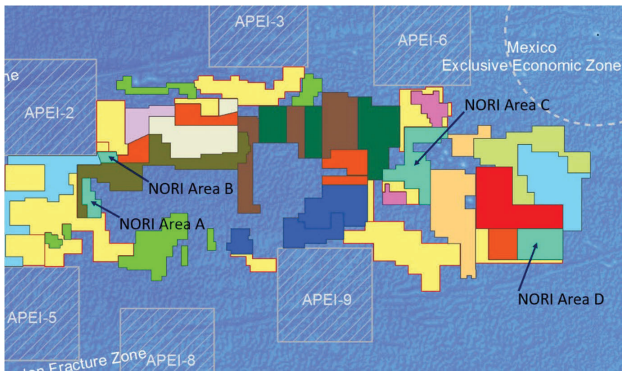
NORI Contract Area

The information that follows relating to the NORI Contract Area of the CCZ is derived, for the most part, from, and in some instances is an extract from, the NORI Technical Report Summary prepared in compliance with the SEC Mining Rules. Portions of the following information are based on assumptions, qualifications and procedures which are not fully described herein. Reference should be made to the full text of the NORI Technical Report Summary, which has been filed as exhibit 96.1 to the registration statement of which this proxy statement/prospectus forms a part. The NORI Technical Report Summary is incorporated herein by reference and made a part hereof.

Location of the NORI Area and access

The NORI Contract Area is located within the CCZ of the northeast Pacific Ocean. The CCZ is located in international waters between Hawaii and Mexico. The western end of the CCZ is approximately 1,000 km south of the Hawaiian island group. From here, the CCZ extends almost 5,000 km east-northeast, in an approximately 600 km wide trend, with the eastern limits approximately 2,000 km west of southern Mexico. The region is well-located to ship nodules to the American continent or across the Pacific to Asian markets. The NORI Contract Area comprises four separate blocks (A, B, C and D) in the CCZ with a combined area of 74,830 km^2.





NORI Contract Area extents

Area	Minimum Latitude (DD)	Maximum Latitude (DD)	Minimum Longitude (DD)	Maximum Longitude (DD)	Minimum UTM X (m)	Maximum UTM X (m)	Minimum UTM Y (m)	Maximum UTM Y (m)	UTM Zone
A	11.5000	13.00000	-134.5830	-133.8330	545220.4	627276.0	1271339	1437255	8

B	13.5801	14.00000	-134.0000	-133.2000	607995.7	694759.8	1501590	1548425	8
C	12.0000	14.93500	-123.0000	-120.5000	500000.0	769458.3	1326941	1652649	10
D	**9.8950**	**11.08333**	**-117.8167**	**-116.0667**	**410465.2**	**602326.1**	**1093913**	**1225353**	**11**

DD — Decimal degrees, UTM — Universal Transverse Mercator map projection

As the CCZ deposit does not include any habitable land and is not near coastal waters, there is no requirement to negotiate access rights from landowners for seafloor collection operations. All personnel and material will be transported to the project area by ship.

See Section 3 of the NORI Technical Report Summary for further specific information of the location of the NORI Contract Area.

Tenements and permits

In July 2011, NORI was granted the NORI Exploration Contract. The NORI Exploration Contract, which was granted pursuant to the ISA's Regulations on Prospecting and Exploration for Polymetallic Nodules in the international seabed area (the "Regulations"), formalized a 74,830 km^2 exploration area, has an initial term of 15 years (subject to renewal for successive five-year periods), and provided for certain obligations with respect to exploration, training, and other programs of activities for the initial period of five-year period. The NORI Exploration Contract also formalized the rights of NORI around future rights. Pursuant to the Regulations, NORI has the priority right to apply for an exploitation contract to collect polymetallic nodules in the same area (Regulation 24(2)). To date, no exploitation licenses for extracting minerals from the seafloor within the Area have been granted. The ISA is currently working on the development of a legal framework to regulate the exploitation of polymetallic nodules in the Area, as described below. ISA participants set an intention of July 2020 to have the regulations finalized; however, the July 2020 session was deferred as a result of the COVID-19 pandemic. NORI expects that the new regulations may be approved within the next two years but there can be no assurance that such regulations will be approved then, or at all. Collection of nodules can only begin when the exploitation regulations currently being developed by ISA have been agreed and provisionally adopted by the Council and approved by all members of ISA at the Assembly. The exploitation regulations will create the legal and technical framework for commercial production of nodules.

Pursuant to paragraph 15(a) and (b) of Section 1 of the annex to the 1994 Implementation Agreement, which relates to article 162 (2)(o)(ii) of UNCLOS, the ISA Council must adopt provisional exploitation regulations within two years of a formal request being made by any State which intends to apply for approval of a plan of work for exploitation.

For more information about UNCLOS, the ISA and the NORI Exploration Contract, see "*Information About DeepGreen — Government Regulation — The NORI Exploration Contract.*"

NORI obligations and sponsorship

During exploration, NORI, is required under the NORI Sponsorship Agreement to, among other things:

- submit an annual report to the ISA;
- meet certain performance and expenditure commitments;
- pay an annual overhead charge (currently $60,000) to cover the costs incurred by the ISA in administering and supervising the contract;
- implement training programs for personnel of the ISA and developing countries in accordance with a training program proposed by NORI in its license application and five-year work plans;
- take measures to prevent, reduce, and control pollution and other hazards to the marine environment arising from its activities in the Area;
- maintain appropriate insurance policies;
- establish environmental baselines against which to assess the likely effects of its program of activities on the marine environment; and

- establish and implement a program to monitor and report on such effects.

NORI is sponsored to carry out its mineral exploration activities in the Area by Nauru, pursuant to a certificate of sponsorship signed by the Government of Nauru on April 11, 2011. Sponsorship of an entity requires the sponsoring State to certify that it assumes responsibility for the entity's activities in the Area in accordance with UNCLOS. NORI is a Nauruan incorporated entity and is subject to applicable Nauruan legislation and regulations.

In 2015, Nauru enacted the International Seabed Minerals Act, which establishes the Nauru Seabed Minerals Authority to administer Nauru's sponsorship of activities carried out in the Area by companies sponsored by Nauru.

In June 2017, Nauru and NORI entered into the NORI Sponsorship Agreement formalizing certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI Contract Area of the CCZ.

In 2016, NORI submitted to the ISA proposed activities for the second five-year period of its exploration contract. NORI indicated that work would focus on:

- reducing project uncertainties and technical risks;
- optimizing the on-shore processing and off-shore production systems (including increasing performance and reliability); and
- improving project economics, including decreasing estimated capital and operating expenditure as well as increasing projected revenues.

Royalties and taxes

Royalties and taxes payable on any future production from the NORI Area will be stipulated in the ISA's exploitation regulations. While the rates of payments are yet to be set by the ISA, the 1994 Implementation Agreement. Section 8(1)(b) prescribes that the rates of payments "shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage."

An ad hoc ISA working group workshop has met several times including most recently in February 2020 to discuss a number of potential royalty and taxation regimes supported by modelling conducted by the Massachusetts Institute of Technology. No final recommendations were made. However, a 2% ad valorem royalty increasing to 6% after a period of five years of production was discussed as well as a 1% ad valorem environmental levy. These amounts were used for the economic analysis included in the initial assessment included in the NORI Technical Report Summary.

Under the NORI Sponsorship Agreement between Nauru and NORI, upon reaching a minimum recovery level within the tenement area, NORI has agreed to pay Nauru a seabed mineral recovery payment for polymetallic nodules recovered from the tenement area, annually adjusted (from year 5 of production) on a compounding basis based on the official inflation rate in the United States.

History of previous exploration activities in the NORI Contract Area

Prior to the implementation of UNCLOS, many offshore exploration campaigns were completed by international organizations and consortia. A number of at-sea trial collection operations were successfully carried out in the CCZ in the 1970s to test potential collection concepts. These system tests evaluated the performance of a self-propelled and several towed collection devices, along with submersible pumps and airlift technology for lifting the nodules from the deep ocean floor to the support vessel. Certain pioneer investors include those entities that carried out substantial exploration in the Area prior to the entry into force of UNCLOS, as well as those entities that inherited such exploration data.

NORI Area D was originally explored by Arbeitsgemeinschaft Meerestechnisch Rohstoffe ("AMR"). AMR subsequently joined Ocean Management Inc. ("OMI"). The OMI consortium comprised Inco Ltd (Canada), AMR (Federal Republic of Germany), SEDCO Inc. (US), and Deep Ocean Mining Co. Ltd (Japan). OMI completed a successful trial collection operation in 1978. Hydraulic pumps, an air lift system, and towed collectors were tested in approximately 4,500 m of water. Approximately 800 tonnes of nodules were recovered.

Kennecott consortium (now a division of Rio Tinto) first became seriously interested in seafloor polymetallic nodules in 1962 (Agarwal et al. 1979). In the 1970s, Kennecott developed and tested components and subsystems of a seafloor collection system, and also carried out significant polymetallic nodule metallurgical processing test work.

Using a different system to OMI, Ocean Mining Associates recovered approximately 500 tonnes of nodules during its trial collection in the 1970s.

Between 1969 and 1974, Deepsea Ventures Inc. carried out 16 survey cruises of three to four weeks' duration each, to define the extent of the polymetallic nodule deposit discovered by them in 1969 in the CCZ. As reported by Deepsea Ventures Inc:

"These activities included the taking of some 294 discrete samples, including the bulk dredging of some 164 tons of manganese nodules from some 263 dredge stations, 28 core stations and three grab sample stations, cutting of some 28 cores, approximately 1000 lineal miles of survey of seafloor recorded by television and still photography, etc. As a result, the deposit of nodules identified with the discovery has been proved to extend generally throughout the entire area (American Society of International Law, 1975)."

Also active in the CCZ was the Ocean Minerals Company ("OMCO"), comprising Amoco Minerals Co. (United States), Lockheed Missiles and Space Company Inc. (United States), Billiton International Metals BV, and dredging company Bos Kalis Westminster (Netherlands). In a program lasting 16 years, OMCO collected thousands of free-fall grab and box core samples of nodules from its claim area and carried out trial collection operations. Lockheed's design efforts resulted in over 80 patents, a seafloor production system that consisted of a remote-controlled collector and crusher, a seafloor to surface slurry riser system, the first industrial-scale dynamic positioning system for a vessel, and a metallurgical processing plant.

Upon making an application, the pioneer investors were required to submit sufficient data and information to enable designation of a reserved area based on the estimated commercial value. These sample data provide the basis of a database held by the ISA and were used initially to define the areas of the NORI application.

See Section 5 of the NORI Technical Report Summary for further specific information of the history of previous exploration of the NORI Contract Area.

Geology and sampling

Seafloor polymetallic nodules occur in all oceans but the CCZ hosts a relatively high abundance of high Ni and Cu grade nodules. The CCZ seafloor forms part of the Abyssal Plains, which are the largest physiographic province on Earth.

The average depth of the seafloor in the Project Area is 3,800 to 4,200 m. Overall, the seafloor slopes at approximately 0.57˚ (1 m per km) but the Abyssal Plains are traversed by ridges, with amplitude of 50 to 300 m (maximum 1,000 m) and wavelength of 1 to 10 km. The Abyssal Plains are punctuated by extinct volcanoes rising 500 to 2,000 m above the seafloor.

Seafloor polymetallic nodules rest on the seafloor at the seawater - sediment interface. Such nodules are composed of nuclei and concentric layers of manganese and iron hydroxides and are formed by precipitation of metals from the surrounding seawater and sediment pore waters. Nickel, cobalt and copper are also precipitated and occur within the structure of the manganese and iron minerals.

Nodules are abundant in abyssal areas with oxygenated bottom waters and low sedimentation rates (less than 10 cm per thousand years). Nodules generally range from about 1 to 12 cm in their longest dimension. Nodules of 1 to 5 cm are typically the most common in NORI Area D, where they have been classified as Type 1 nodules.

The specific conditions of the CCZ (water depth, latitude, and seafloor sediment type) are considered to be the key controls for the formation of polymetallic nodules.

Information on the mineralization within NORI Area D comprises a combination of sampling undertaken by NORI as well as free-fall grab sampler ("FFG") and box core sampler ("BC") data supplied by the ISA at the time of the NORI application and also supplied by the ISA to NORI in 2012. Additional regional data, assembled by the ISA

as part of its Geological Model Project during 2008 to 2010 ("ISA 2010"), are available. The data provide significant coverage over NORI Area D and indicate a high abundance of nodules in this region, as has been confirmed by NORI's exploration.

During the 2018 NORI campaign, 91% of nodules sampled were situated at surface. These include nodules on the surface and nodules with their top surfaces in the upper 1 cm of sediment. A few nodules were found at depth; most of these were usually clustered around the edges of the box core and are considered to have been pushed below surface by the box coring process. Significant nodule abundance below surface was only recorded in one out of 45 samples. The nodules vary in abundance, in some cases touching one another and covering more than 70% of the seafloor. They can occur at any depth, but the highest concentrations have been found on abyssal plains between 4,000 and 6,000 mbsl. Data analysis in Section 9 of the NORI Technical Report Summary shows that nodule abundance variability is significantly higher than metal grades, suggesting that abundance estimation will be the key variable in mineral resource estimation.

NORI completed offshore exploration campaigns in 2012, 2013, 2018, 2019 and 2020. During these campaigns a variety of data was collected including:

- bathymetric mapping of the whole of NORI Area D using a hull-mounted Kongsberg Simrad EM120 12 kHz, full-ocean depth multibeam echo-sounding system (MBES). This system also provided backscatter data with which seafloor characteristics could be interpreted;
- detailed seafloor survey work with an autonomous underwater vehicle (AUV), utilizing an MBES, Side Scan Sonar (SSS), Sub-Bottom Profiler (SBP), and camera payload; and
- a total of 252 box core samples collected using a 0.75 m^2 box corer, mainly on a 10 km by 10 km square grid.

The nodules in the box cores were collected, and their characteristics measured and recorded in detail. Samples of nodules were collected in duplicate and assayed at two reputable, well-qualified laboratories: ALS and Bureau Veritas. Certified reference material, and blank samples were inserted to provide additional levels of quality control. No significant issues were identified with the assay results.

The backscatter data and the sidescan sonar and seafloor photography indicate strong continuity of nodule abundance across NORI Area D. There is a clear relationship between nodule long axis length and nodule weight and therefore it is possible to estimate nodule abundance from photographs. Several estimation techniques were tested, and methodologies were developed that are suitable for closely-packed (Type 1) and less closely-packed (Type 2 and 3) nodules.

For more information about the NORI exploration campaigns in 2012, 2013, 2018, 2019 and 2020, see Section 7 of the NORI Technical Report Summary.

Mineral resource estimate

The mineral resource was classified on the basis of the quality and uncertainty of the sample data and sample spacing, in accordance with the definitions of "inferred mineral resource," "indicated mineral resource" and "measured mineral resource" under the SEC Mining Rules.

Mineral resources were estimated using a two-dimensional block model. Estimates of nodule abundance and nickel, manganese, cobalt, and copper grades were performed using kriging. A variety of methods was used to validate the estimates, including conditional simulation. The estimates of nodule abundance were used to calculate the tonnage of the mineral resources.

The bathymetric mapping enabled the interpretation of parts of seafloor that are possibly too steep for recovery of nodules using the systems considered by the NORI Technical Report Summary. Seafloor areas with slopes steeper than 6° were excised from the 2020 mineral resource estimate.

The measured mineral resource was assigned to the area within NORI Area D where box-core sampling was conducted on a nominal 7 km by 7 km spacing and infilled with estimates of nodule abundance from seafloor photography to a spacing of 3.5 km by 3.5 km.

The indicated mineral resource was assigned to the area within NORI Area D where box-core sampling was conducted on a nominal spacing of 7 km by 7 km or 10 km by 10 km but without additional photo-estimates of nodule abundance.

The inferred mineral resource was assigned to the areas of abyssal plain in the southeast corner of NORI Area D that are largely unsampled. The volcanic high in the southeast corner was excluded from the mineral resource estimate due to the high level of uncertainty about nodule abundance and grades in this domain.

The mineral resource estimate for NORI Area D, with an effective date of December 31, 2020, and at a 4 kg/m^2 abundance cut-off is set forth below. This cut-off is derived from the estimates of costs and revenues presented in the NORI Technical Report Summary. The method of calculation for the cut-off determines the minimum average nodule abundance needed during steady state operations such that the revenue minus costs (excluding capital) is greater than zero. Revenue includes metal pricing and metallurgical processing recoveries, and the costs include the collection, transport, processing, corporate costs and royalties.

NORI December 31, 2020 In-Situ Mineral Resource estimate for NORI Area D at 4 kg/m^2 abundance cut-off

NORI Area	Category	Tonnes (Mt (wet))	Abundance (wet kg/m^2)	Nickel (%)	Copper (%)	Cobalt (%)	Manganese (%)	Silicon (%)
D	Measured	4	18.6	1.42	1.16	0.13	32.2	5.13
D	Indicated	341	17.1	1.40	1.14	0.14	31.2	5.46
D	Measured + Indicated	345	17.1	1.40	1.14	0.14	31.2	5.46
D	Inferred	11	15.6	1.38	1.14	0.12	31.0	5.50

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

Due to the extremely low variance in the grades and the high metal content of the nodules, a cut-off based on abundance is appropriate for determining the limits of economic exploitation. A cut-off of 4 kg/m^2 abundance was chosen for the NORI Contract Area, based on the estimates of costs and revenues presented in the initial assessment contained in the NORI Technical Report Summary. The metal prices assumed in the calculation of the cut-off were: nickel metal $16,472/t; nickel in nickel sulphate $18,807/t Ni; copper metal $6,872/t; cobalt metal $46,333/t; cobalt in cobalt sulphate $56,920/t Co; manganese in manganese silicate $4.50/dmtu. The price estimates are long term (2034 – 2046) forecasts provided in a report by CRU International Limited (CRU, October 23, 2020). The Qualified Person considers that this timeframe is reasonable in view of the likely time required to bring the majority of the NORI mineral resources into production.

Sampling of NORI Area D at a spacing of 10 km by 10 km during the 2019 campaign confirmed that the nodules have low variability and high continuity. The 2020 mineral resource estimate set forth above is 4 Mt Measured and 341 Mt indicated, and 11 Mt inferred mineral resources. Taking into account the conversion of the majority of inferred to indicated mineral resources, the remaining inferred mineral resource has decreased by 26 Mt as a result of excluding the Volcanic High domain in the south-eastern corner of NORI Area D, due to uncertainty about the occurrence of nodules in this area. The 2020 resource estimate is also slightly higher in abundance (5.4% higher), and nickel (6.1% higher), cobalt (5.4% higher) and manganese (2.2% higher) grades than the 2018 estimate.

Comparison of the area covered by inferred, indicated and measured mineral resource for the 2020 estimate and the same area in the 2018 model shows that nickel grade has increased by 6% (1.32% to 1.40% Ni) while abundance has increased by 6% (16.0 to 17.0 kg/m^2). Mineral resource tonnage has increased by 10% (from 10 to 11 Mt) in the inferred area and 7% (from 320 to 341 Mt) in the indicated area. The positive conversion rates arising from infilling the sampling grid with high-quality box core sample data (rather than extending the area sampled) are exceptionally high compared to the typical outcomes from infill sampling of terrestrial mineral deposits.

While the NORI Technical Report Summary focuses primarily on the development of collection operations in NORI Area D, NORI holds another three areas in the CCZ under the same title. These areas (NORI Areas A, B and C) are estimated to contain inferred mineral resources of 510 Mt (wet) at 1.28% Ni, 0.21% Co, 1.04% Cu, 28.3%

Mn, at an average abundance of 11 kg (wet)/m^2 at a 4 kg/m^2 abundance cut-off (effective date of December 31, 2020). The polymetallic nodule mineralization in NORI Areas A, B and C has similar characteristics to NORI Area D and it is reasonable to assume that the technology proposed in the NORI Technical Report Summary would be suitable for development of these additional areas.

NORI Area A, B and C December 31, 2020 In-Situ Mineral Resource estimate at 4 kg/m^2 abundance cut-off

NORI Area	Category	Nodule tonnage	Abundance	Ni	Cu	Co	Mn
		(Mt (wet))	(wet kg/m^2)	(%)	(%)	(%)	(%)
A	Inferred	72	9.4	1.35	1.06	0.22	28.0
B	Inferred	36	11	1.43	1.13	0.25	28.9
C	Inferred	402	11	1.26	1.03	0.21	28.3

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

Information concerning our mineral properties in the NORI Technical Report Summary and in this proxy statement/prospectus includes information that has been prepared in accordance with the requirements of the SEC Mining Rules set forth in subpart 1300 of Regulation S-K. Under SEC standards, mineralization, such as mineral resources, may not be classified as a "reserve" unless the determination has been made that the mineralization could be economically and legally produced or extracted at the time of the reserve determination. As used in this proxy statement/prospectus, the terms "mineral resource," "measured mineral resource," "indicated mineral resource" and "inferred mineral resource" are defined and used in accordance with the SEC Mining Rules set forth in subpart 1300 of Regulation S-K. **You are specifically cautioned not to assume that any part or all of the mineral deposits in these categories will ever be converted into mineral reserves, as defined by the SEC.**

You are cautioned that mineral resources do not have demonstrated economic value. Inferred mineral resources have a high degree of uncertainty as to their existence as to whether they can be economically or legally mined. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. A significant amount of exploration must be completed in order to determine whether an inferred mineral resource may be upgraded to a higher category. About 97% of the NORI D resource is defined in the measured and indicated categories. **Therefore, you are cautioned not to assume that all or any part of an inferred mineral resource exists, that it can be economically or legally mined, or that it will ever be upgraded to a higher category. Likewise, you are cautioned not to assume that all or any part of measured or indicated mineral resources will ever be upgraded to mineral reserves.**

Development plan

NORI proposes to implement the project in multiple phases that will allow the seafloor collection systems to be tested and then nodule production to be gradually ramped up. The phased approach will facilitate de-risking of the project for relatively low initial capital investment. Additionally, this phased development will allow for an adaptive approach to environmental management providing learning at small-scale which would be applied as the development increases scale.

The proposed seafloor production development phases are as follows:

- The Collector Test is designed to perform proof of concept for the methods of collecting and lifting the nodules while acquiring sufficient data to design a commercial system. The Collector Test would use a converted sixth generation drillship, the *Hidden Gem*. Nodules collected during the test would be stored on the *Hidden Gem* and brought to shore for use in large scale process pilot testing. The test would not demonstrate the transshipment of nodules to a shore-based facility.
- Project Zero would be an extension of the Collector Test using an upgrade of the Hidden Gem to produce a sufficient and continuous quantity of nodules to support a relatively small commercial operation of about 1.3 Mtpa (wet) nodules delivered to a shore-based facility. This operation would demonstrate a

more continuous collection operation at a larger scale than the collector test and would demonstrate the transshipment of nodules to a processing facility. It would also allow for the implementation and testing of adaptive management systems to ensure environmental compliance.

- Project One would increase production in a further three steps: 1) introduction of a second converted drillship (Drill Ship 2) with a capacity of up to 3.6 Mtpa (wet), 2) a further upgrade of the Hidden Gem to up to 3.6 Mtpa (wet) and 3) construction of a new purpose-built production support vessel (Collector Ship 1) with capacity of up to 8.2 Mtpa (wet). Project One would benefit from lessons learned on the Collector Test and Project Zero.
- The processing of the polymetallic nodules would also be ramped up in phases:
- In Project Zero, NORI proposes to toll-treat polymetallic nodules at existing RKEF smelters, utilizing excess industry capacity. NORI advises there is significant interest from many parties in China to utilize RKEF plants which may become stranded as a result of the Indonesian government nickel laterite ore export ban restricting supply of the nickel laterite feedstock that they currently utilize. These RKEF plants were originally built to convert nickel laterite to nickel pig iron and could be converted to smelt polymetallic nodules.
- In Project One, a purpose-built process plant would be constructed, including pyrometallurgical and hydrometallurgical circuits. Nodule production would be increased in phases by treatment in this new plant.

Collection methods

The main items of offshore infrastructure are the nodule collector vehicles, the riser, and three production support vessels ("PSV"): *Hidden Gem*; Drill Ship 2; and Collector Ship 1. Collector Ship 1 is intended to be supported by a collector support vessel.

The nodules are intended to be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection. The collectors are intended to be remotely controlled and supplied with electric power via umbilical cables from the PSV. The collectors are intended to traverse the seabed at a speed of approximately 0.5 m/s. Suction dredge heads on each collector are expected to recover a dilute slurry of nodules, sediment, and water from the seafloor. Each collector is expected to yield about 254 t/hr (dry) nodules. A hopper on each vehicle is expected to separate sediment and excess water, which is expected to pass out of the hopper overflow, from the nodules, which is planned to be pumped as a higher concentration slurry via flexible hoses to a riser.

The riser is a steel pipe through which nodules are planned to be transferred to the surface by means of an airlift. The riser is intended to consist of three main sections. The lower section is expected to carry the two-phase slurry of nodules and water from the collectors to the airlift injection point. The mid-section is expected to carry a three-phase mixture of slurry and air. This section will also include two auxiliary pipes: one to carry the compressed air for the airlift system, and one to return water from dewatering of the slurry to its subsea discharge point. The upper section of riser is expected to have a larger diameter to account for the expansion of air in the airlift.

The airlift is intended to work by lowering the average density of the slurry inside the riser to a level lower than seawater. The difference between the hydrostatic pressure of the seawater at depth and the pressure caused by the weight of the low-density three-phase slurry column inside the riser is expected to force the slurry column to rise. The energy to achieve the lift is planned to be supplied by compressors housed on the PSV, which are planned to be capable of generating very high air pressures — up to 15 MPa.

The PSVs are planned to each support a RALS and its handling equipment, and to house the airlift compressors, collector vehicle control stations, and material handling equipment. All power for offshore equipment, including the nodule collecting vehicles, is intended to be generated on the PSVs. The PSVs are intended to be equipped with controllable thrusters and to be capable of dynamic positioning (DP), which should allow the vessels and risers to track the collectors. The Collector Ship 1 PSV is expected to be similar in size to an Aframax or New Panamax class of tanker, displacing approximately 103,000 t, and housing a crew of around 120 personnel. Nodules are planned to be discharged from the RALS to the PSVs, where they are expected to be dewatered and temporarily stored or transferred directly to a transport vessel.

A separate collector support vessel is expected to remain at sea to support Collector Ship 1. It is expected to be configured as a subsea support platform, as commonly used in oil industry, with a displacement of around 17,250 t. The function of the collector support vessel will be to facilitate collector maintenance and repair.

The NORI Technical Report Summary assumes transportation of nodules will be by chartered vessels, with deadweight capacities of 35,000 to 100,000 tonnes. The vessels are expected to require dynamic positioning capability to enable them to be loaded at sea alongside the PSV. Hydraulic offloading of the nodules from the PSV to the transport ships is assumed in the NORI Technical Report Summary, but future studies will confirm the offloading mechanism.

The overall nodule collector efficiency is estimated at 80%. The recovery value is based upon test work conducted in the 1970s. Nodule recovery efficiency is the product of nodule entrainment efficiency, subsea concentrator recovery, and dewatering system efficiency. The estimate of dewatering recovery used in the NORI Technical Report Summary is higher than indicated by the 1970s test work because data that has come to light recently suggests the amount of breakup during lifting the nodules up the RALS may be significantly less than previously assumed (Kennecott (1978), DRT (2015)).

Expected Mineral Resource modifying factors

Modifying factors	Value	Description
Resource area efficiency	92%	The resource area efficiency factor is defined as the width of the collector divided by the width of the collector path. A 0.5 m undisturbed strip is to be left either side of the collector. For a 12 m wide collector, the resource area efficiency is calculated as 12/13.
Collector pick-up efficiency	90%	This is the percentage of nodule mass passed over by the collector that is pickup up by the collector head.
Collector underflow efficiency	95%	This is percentage of nodule mass that is pickup up that is passed to the collector underflow.
Nodule attrition	0%	This is the percentage of mass of nodule lost through attrition from the sea floor to trans-shipment. It is included in the trans-shipment efficiency.
Trans-shipment efficiency	93%	This is the percentage of nodule mass transferred from the production vessel to trans-shipment.
Overall collector efficiency	80%	This is the percentage of nodule mass passed over by the collector that is delivered to the transport vessel. It includes losses in the pick-up, overflow, attrition and trans-shipment (90%*95%*100%*93%).
Overall resource recovery factor	73%	Is the product of the resource area efficiency * collector pick-up efficiency * collector under flow efficiency * (1 – nodule attrition (%)), * trans-shipment efficiency (92%*90%*95%*100%*93%).

For more information on polymetallic nodule collection methods, see Section 13 of the NORI Technical Report Summary.

Mineral processing and metallurgical testing

A combined pyro-metallurgical and hydro-metallurgical flowsheet was evaluated for the initial assessment included in the NORI Technical Report Summary. Similar flowsheets were investigated at various times over the last several decades. NORI has undertaken bench-scale test-work and is in the process of completing pilot-scale testing of the proposed flowsheet. This work has confirmed or improved the flowsheet that was initially developed from extensive information available in the literature.

Pyrometallurgical processing of nodules has been extensively studied from the early 1970s until the present day and appears to be the preferred process for most of the other currently active nodule processing research groups. Many groups including: Kennecott; Inco; Cuban/Bulgarian; German; Indian; Japanese; and Korean have studied pyrometallurgical processing of nodules at a laboratory scale. The nodule samples for these tests were collected from their respective license areas in the CCZ. The nodules used in each of the studies have similar compositions

but there are subtle variations that can have significant implications for pyrometallurgical processing. Of particular importance is the ratio of MnO:SiO2 in the nodules as this impacts the choice of process operating parameters for the electric furnace smelting operation.

For Project Zero, NORI proposes to toll treat polymetallic nodules at existing RKEF smelters. During Project One, NORI proposes the progressive construction and expansion of a new pyrometallurgical and hydrometallurgical process plant for the recovery of battery-grade nickel and cobalt sulphate powder, copper cathode and manganese silicate, from polymetallic nodules. This is expected to allow for the proportion of toll treatment to be reduced.

Four rotary kiln and electric furnaces lines ("RKEF") and two hydrometallurgical refineries are expected to be required to meet our expected production demand.

The pyrometallurgical front end of the plant is expected to use RKEF lines that calcine and smelt the nodules to form an alloy. The alloy is then expected to be sulphidized to form a matte and then partially converted in a Peirce-Smith converter operation to remove iron. The matte from the sulphidation step is planned to then be sent to the hydrometallurgical refinery. The pyrometallurgical process is expected to be similar to that successfully used to process some nickel laterite ores.

The hydrometallurgical refinery concept is based on a sulphuric acid leach flowsheet. A two-stage leach would be used to produce copper cathode and a pregnant leach solution rich in nickel and cobalt, while low in copper. Further processing of the pregnant leach solution is based on mixed-sulphide precipitate processing flowsheets employing solvent extraction. The final production of battery-grade nickel and cobalt sulphates is expected to use crystallization.

The pyrometallurgical process is expected to generate a manganese silicate stream that we believe could be sold to the manganese industry and small converter slag stream that we believe could be sold for industrial applications. No value has been ascribed to converter slag in the NORI Technical Report Summary. The hydrometallurgical plant is expected to produce an ammonium sulphate by-product for sale to the fertilizer industry. Thus, together with the ability to recycle other hydrometallurgical side-streams to the pyrometallurgical process, the flowsheet is planned to have neither tailings ponds nor permanent slag repositories and should not generate substantial waste streams.

The average targeted processing rate for the new processing plant at full capacity is expected to be 6.4 Mtpa of nodules (dry basis). The location and host country of the processing operation has not yet been determined. Engineering design has not yet been undertaken. Expected metallurgical recoveries are summarized in the table below.

Process Step	Nickel Recovery (%)	Cobalt Recovery (%)	Copper Recovery (%)
Final matte	94.6%	77.4%	86.5%
Hydrometallurgical products before recycle	98.9%	98.0%	96.2%
Recycled residue	94.6%	77.4%	86.5%
Overall recovery	94.6%	77.2%	86.2%

In addition to the above base metals, 98.9% of the manganese contained in the feed is expected to be recovered to the manganese silicate product, containing 52.6% MnO. Approximately 7.3 Mt of manganese silicate is expected to be produced per annum (from steady state operation from 2030 onwards).

For more information on mineral processing and metallurgical testing, see Section 14 of the NORI Technical Report Summary.

Environmental studies, permitting, community, or social impact

Historically, a significant amount of technical work has been undertaken within the CCZ by the contractors under the ISA and a significant body of information has been acquired during the past 40 years on the likely environmental impacts of collecting nodules from the sea floor.

NORI's offshore exploration campaigns have included sampling to support environmental studies, collection of high-resolution imagery and environmental baseline studies. A number of future campaigns are planned to collect data on ocean currents and water quality to assist plume modelling, environmental baseline studies, box core and multicorer sampling focused on benthic ecology and sediment characteristics.

NORI has commenced the ESIA process in support of an application for an exploitation license for the commercial collection of deep-sea polymetallic nodules. A comprehensive program of metocean and biological data acquisition is in progress to characterize the baseline conditions at a designated Collector Test site and control sites in the NORI Contract Area.

NORI intends to manage the project under the governance of an Environmental Management System ("EMS"), which is to be developed in accordance with the international EMS standard, ISO 14001:2004. The EMS will provide the overall framework for the environmental management and monitoring plans that will be required.

An EMMP will be required. The plan will specify the objectives and purpose of all monitoring requirements, the components to be monitored, frequency of monitoring, methods of monitoring, analysis required in each monitoring component, monitoring data management and reporting. The plan will be submitted to the ISA as part of the exploitation contract application. This plan will involve an ecosystem approach incorporating an adaptive management system.

The social impacts of the offshore operation are expected to be positive. The CCZ is uninhabited by people, and there are no landowners associated with the CCZ. No significant commercial fishing is carried out in the area. The projects are expected to provide a source of revenue to our sponsor countries, Nauru, Tonga, Kiribati and the ISA.

The onshore environmental and social impacts have not yet been assessed because the process plant has not been designed in detail, and the location and host country (and hence regulatory regime) not confirmed. The planned metallurgical process will not generate solid waste products, and the deleterious elements (for example, cadmium and arsenic) content of the nodules is very low, indicating that with careful management the environmental impacts of the processing operation could be very low.

For more information on environmental studies, permitting and social or community impact, see Section 17 of the NORI Technical Report Summary.

Economic analysis

A financial model based on estimates of future cash flows derived from extraction of nodules from the NORI D project has been developed in-house by DeepGreen. AMC reviewed the logic, input assumptions and integrity of the calculations and forecasts. The financial model is for NORI Area D only, which is at a preliminary level of planning and design.

The collection plan considered in the NORI Technical Report Summary contemplates a 23-year production period. The expected production period is within the expected duration of a NORI Area D Exploitation Contract which would be thirty (30) years (with possible extensions by periods of ten (10) years) as outlined in the current draft of the regulations for exploitation of mineral resources in the Area (ISBA/25/C/WP.1).

After the initial 23-year period, substantial resources will remain in the other NORI Areas that could support future collection (combined inferred mineral resource in NORI Areas A, B and C of 510 Mt (wet) at 1.28% Ni, 0.21% Co, 1.04% Cu, 28.3% Mn, at an average abundance of 11 kg (wet)/m^2). The proposed project schedule is shown in the Gantt chart in Figure 19.1 of the NORI Technical Report Summary.

In Project Zero, NORI expects to toll treat the nodules in third party pyrometallurgical plants and sell the RKEF products into the alloy market. This will be expected to generate revenue while its pyrometallurgical and hydrometallurgical facilities are planned to be built.

In Project One, NORI expects to stage the construction of its multiple pyrometallurgical and hydrometallurgical lines to flatten out capital expenditure requirements. Nodule production is expected to be directed preferentially to the NORI pyrometallurgical plants as this is expected to be the lowest operating cost option. Whenever these facilities are at maximum capacity (particularly during the ramp-up phase), the surplus nodules are expected to be sent for toll treatment.

NORI expects that it will ensure that its own hydrometallurgical refineries are filled up to maximum capacity, as this is expected to produces the highest value products. Whenever its own hydrometallurgical refineries are at full capacity, NORI expects to sell the surplus product from its pyrometallurgical plant directly to the matte market.

While the matte is not as valuable as the refined products from the hydrometallurgical plant (nickel sulphate, cobalt sulphate, and copper cathode), it still provides a consistent revenue stream and assists for periods when the refineries are at full capacity.

Some of the alloy production from toll treatment of NORI nodules are expected to be shipped to the NORI hydrometallurgical plants to make use of spare capacity. This will require the alloy from the third party RKEF to be sulphidized prior to hydrometallurgical treatment.

Based on preliminary discussions with potential buyers, NORI believes that there is sufficient demand for the alloy and matte over the life of the project.

The analysis was performed on a 100% ownership basis and excludes consideration of financing costs and forward metal sales. The analysis assumes the economic parameters listed in the table below.

Assumed Economic Inputs

Parameters	Units	Values
Hydrometallurgical plant Ni recovery	%	94.6%
Mn recovery	%	98.9%
Hydrometallurgical plant Cu recovery	%	86.2%
Hydrometallurgical plant Co recovery	%	77.2%
Pyrometallurgical plant Cu recovery	%	96.8%
Pyrometallurgical plant Cu recovery	%	93.3%
Pyrometallurgical plant Co recovery	%	92.7%
Mn silicate grade	%	40.0%
Cu cathode grade	%	99.9%
Payability of Cu content in cathode	%	100%
Nodule moisture content	%	24%
On-shore tax rate	% of taxable income	20%
Average off-shore tax (to ISA)	% of taxable income	6.7%

Commodity Prices

Project revenues will come from the following sources:

- a nickel sulphate product;
- a copper cathode product;
- a cobalt sulphate product;
- a manganese silicate product;
- an ammonium sulphate product;
- a nickel alloy product containing copper and cobalt; and
- a matte product from the NORI pyrometallurgical plants containing nickel, copper and cobalt, which would be sold to the matte market.

NORI has used the following payable percentages for the alloy:

- Nickel: 80% of in-situ value in the alloy;
- Copper: 40% of in-situ value in the alloy; and
- Cobalt: 80% of in-situ value in the alloy.

The following estimates for treatment charges and refining charges for the alloy product were used in the NORI financial model:

- a refining charge of $1,697/tonne of contained nickel in the alloy;
- a refining charge of $800/tonne of contained nickel in the alloy;
- a refining charge of $6,700/tonne of contained nickel in the alloy; and
- a treatment charge $300/tonne of alloy.

For the matte product, NORI has used a used a payables figure of 83% of the market metal price of nickel, copper and cobalt. The metal recoveries for the matte and alloy are those from the pyrometallurgical plant, whilst the refined products (nickel sulphate, copper cathode and cobalt sulphate) are from the hydrometallurgical refinery metal recoveries.

The prices forecast by CRU and adopted for use in the economic analysis were derived from a report prepared by CRU dated October 23, 2020 and are listed in the table below. The Qualified Person considers the metal price assumptions underpinning the analysis are reasonable.

Commodity prices

	2024 ($)	2025 ($)	2026 ($)	2027 ($)	2028 ($)	2029 ($)	2030 ($)	2031 ($)	2032 ($)	2033 ($)	2034 – 2046 ($)
Ni metal, LME cash (/t)	14,067	14,467	14,868	15,269	15,670	16,071	16,472	16,472	16,472	16,472	16,472
Ni Sulphate (/t)	15,610	16,027	16,443	16,860	17,269	17,678	18,087	18,087	18,087	18,087	18,807
SiMn, China import, 44% Mn (/dmtu)	4.80	4.70	4.70	4.60	4.60	4.50	4.50	4.50	4.50	4.50	4.50
Cu, Grade A cathode – LME cash (/t)	6,435	6,497	6,557	6,615	6,673	6,730	6,787	6,805	6,822	6,839	6,872
Co, EU Co 99.8% min (EXW) (/t)	52,881	39,914	38,204	41,526	45,137	49,062	51,106	50,600	49,126	47,695	46,333
Co Sulphate premium over Co metal (ex-China) (/t)	64,250	49,035	46,933	51,014	55,450	60,272	62,784	62,162	60,351	58,594	56,920

Production schedule

The production schedule on which the economic analysis is based was developed on an annual basis. The Qualified Person cautions that a prefeasibility study has not been undertaken and that the seafloor production schedule is preliminary in nature and should not be interpreted as a mineral reserve. Approximately 96% of the mineral resource within NORI Area D is classified as indicated and a further 1% is classified as measured resource. The LOM production sequence includes 6 Mt (wet) of nodules that are classified as inferred mineral resources. This is approximately 2% of the total LOM production.

The production schedule assumes staged operation initially of the Hidden Gem, then Drill Ship 2 and finally Collector Vessel 1, as outlined in Section 16.1 of the NORI Technical Report Summary.

The nodule metal grades and nodule abundance varying annually according to the life of mine schedule. The grades and nodule abundance for the mine plan were derived from a preliminary production schedule developed by AMC as outlined in Section 16.7 of the NORI Technical Report Summary. The higher abundance areas were targeted by the production schedule. The metal grades and abundance used in the schedule are compared to the averages (of all mineral resource categories) for NORI Area D in the table below.

Comparison of IA mine plan to Mineral Resource for NORI Area D

	Mineral Resource in NORI Area D (all categories)	Seafloor production plan	Difference (%)
Tonnage (Mt wet)	356	254	71%
Nodule abundance (kg/m^2)	17.0	16.9	99%
Ni grade (%)	1.40	1.4	100%
Mn grade (%)	31.2	31.0	99%
Cu grade (%)	1.14	1.1	100%
Co grade (%)	0.14	0.14	98%

The production ramp-up discussed in Section 17 of the NORI Technical Report Summary was adopted for the production schedule. The Qualified Person considers the assumptions underpinning the initial assessment and economic analysis are reasonable.

Capital and operating costs

The capital cost estimates for the Project are summarized below. Pre-project items include data gathering and studies that will occur prior to construction. Offshore project costs include the procurement and integration of the PSVs, the collector support vessel, the fabrication of the collectors, and the RALS. On-shore project costs consist principally of the construction of the minerals processing pyrometallurgical plant and hydrometallurgical refinery. Sustaining costs are for both on-shore and off-shore assets, and closure costs are principally for rehabilitation of the onshore minerals processing site.

Section	Cost estimate ($ million)
Pre-project costs	237
Project costs	
Off-shore project costs	
Project Zero	204
Project One	2,244
Total	2,448
On-shore project costs	
Project One	4,786
Total	4,786
Total project costs	7,234
Sustaining capital costs (on-shore and off-shore)	2,637
Closure costs	500
Total	10,607

Operating costs have been estimated at $1.8 billion per annum during steady state production (from 2030 onwards). Expenditure of a total of $37.5 billion over the life of the project on operating costs is expected. On-shore processing is the most significant operating cost.

Average operating cost estimates during steady state operation (from 2030 onwards)

Section	Average Operating Cost over Life of Mine ($ million pa)	Average Unit Cost (/t – wet tonne nodules recovered)	Average Unit Cost (/t – dry tonne processed)
Off-shore	$ 240.74	$ 19.31	$ 25.40
Shipping	$ 254.37	$ 20.40	$ 26.84
On-shore	$ 1,286.19	$ 103.14	$ 135.71
Other	$ 25.00	$ 2.00	$ 2.64
Total	$ 1,806.31	$ 144.85	$ 190.59

For more information on capital and operating costs, see Section 18 of the NORI Technical Report Summary.

Cash flows analysis

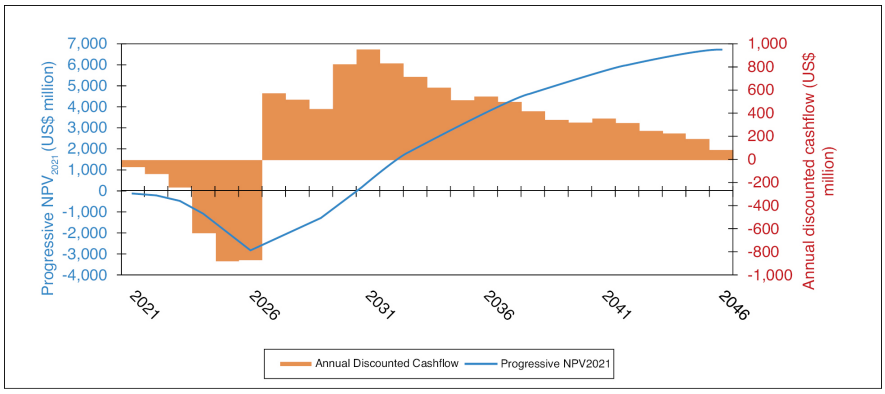
The economic analysis set forth in Section 19 of the NORI Technical Report Summary presents a post-tax, real (uninflated) cash flows analysis. The valuation date is January 1, 2021. The analysis was performed on a 100% ownership basis and excludes consideration of financing costs and forward metal sales. The initial assessment indicates a positive economic outcome. Undiscounted post-tax net cash flow of $30.6 billion is expected. An internal rate of return of 27% has been estimated from the financial model. Discounted cash flow analysis of unleveraged real cashflows, discounting at 9% per annum, indicates a pre-tax project net present value (NPV) of $11.2 billion and a post-tax project NPV of $6.8 billion, which includes the LOM production of polymetallic nodules that are presently classified as inferred mineral resources, representing approximately 2% of the total LOM production. Excluding the inferred mineral resources from the economic analysis, the post-tax project NPV is estimated at $6.7 billion, which is not a significant difference from the economic analysis that includes the inferred mineral resources. The project reaches its lowest cumulative undiscounted cashflow figure of $4.0 billion in 2026. Undiscounted payback period is 6.6 years after commencement of production.

The total cashflows are summarized below:

	Value ($ million)
Cashflow item	
Ni revenue	$ 44,106
Mn revenue	$ 26,785
Cu revenue	$ 12,685
Co revenue	$ 11,075
Ammonium sulphate revenue	$ 439
Total revenue	**$ 95,090**
Pre-project capital	$ 237
Off-shore construction	$ 2,448
On-shore construction	$ 4,786
Off-shore sustaining capital	$ 1,418
On-shore sustaining capital	$ 1,219
Closure costs	$ 500
Total capital	**$ 10,607**
Off-shore operating costs	$ 5,154
Shipping costs	$ 5,266
On-shore operating costs	$ 26,544
Corporate costs	$ 560
Total operating costs	**$ 37,524**
Royalties	$ 7,195
Onshore tax	$ 9,123
Taxes and royalties	**$ 16,318**
Net undiscounted cashflow	**$ 30,641**

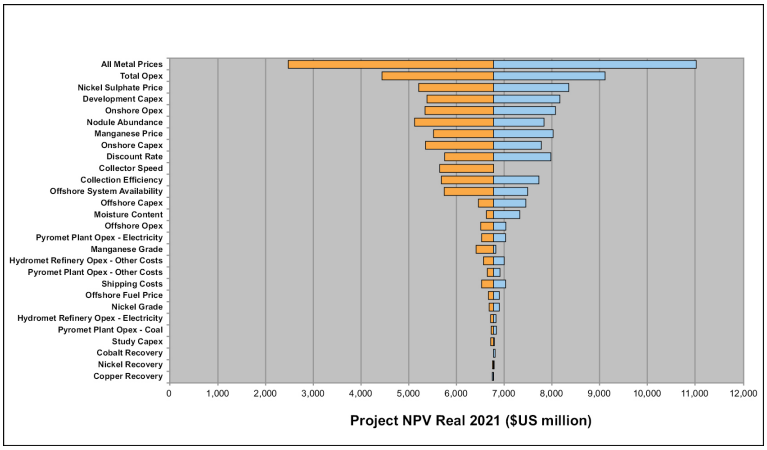
Project revenues are expected to come from the following sources: (a) a nickel sulphate product; (b) a copper cathode product; (c) a cobalt sulphate product; (d) a manganese silicate product; (e) an ammonium sulphate product; (f) a nickel alloy product containing copper and cobalt; and (g) a matte product from the NORI pyrometallurgical plants containing nickel, copper and cobalt which would be sold to the matte market.

The discounted cashflows and progressive NPVs are shown below:



The date of the investment decision is expected to be on or around June 30, 2023. NORI expects to spend $237 million on pre-project activities between 2021 and 2024. The future value of the project on June 30, 2023 (after the pre-project expenditure is sunk and time has elapsed) is expected to be $8.6 billion and the IRR from that point is expected to be 29%.

The sensitivity of project economics to changes in the main variables was tested by selecting high and low values that represent a likely range of potential operating conditions. The variables with the biggest negative impact on NPV are all metal prices, total OPEX, collector speed, nickel sulphate price and development capex. In general, revenue drivers have the biggest impact, followed by OPEX variables and then CAPEX variables



Tornado diagram of NPV sensitivity to variables

The initial assessment is preliminary in nature, and further planning, engineering studies, design, cost estimation and seafloor tests are required before mineral resources can be converted to mineral reserves. There is no certainty that the proposals and results presented in the initial assessment will be realized. A prefeasibility study has not yet been undertaken. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

The initial assessment included in the NORI Technical Report Summary indicates that the NORI Area mineral resource is potentially economic. The Qualified Person recommends that further data gathering, analysis, design and cost estimation be undertaken to advance the project.

Internal controls and data verification

The original assay sheets for the individual samples collected by the pioneer investors from within the NORI Area are not available for auditing against the values in the database. Neither AMC nor DeepGreen nor NORI have had access to the original assay sheets for the individual samples that are within the Area, nor the quality control procedures used by the laboratories and the ISA. However, the consistency between the abundance and grade data collected by the pioneer investors, as presented in Section 9.1 of the NORI Technical Report Summary, supports the contention that the quality of the pioneer investor data is satisfactory.

It is also reasonable to infer that the pioneer investor data are of sufficient quality for resource estimation because the ISA is an independent agency with significant accountability under the UNCLOS. Part of its mandate is the receipt and storage of seafloor sampling data suitable for the estimation of nodule resources and the legally binding award of licenses. It is reasonable to assume that a reasonable level of care was applied by the ISA.

Data collected by NORI is well-documented and was subject to satisfactory quality assurance/quality control processes. Documentation verified by the Qualified Person includes photographs, daily exploration reports, digital logging sheets and original assay reports. In the opinion of the Qualified Person, the NORI data is of high quality and suitable for estimation of measured mineral resources.

Assaying of nodules collected by NORI in 2012, 2013, 2018, and 2019 confirm the mean grades of the historical grab samples and support the contention that the quality of the pioneer investor data is satisfactory for inclusion in resource estimation. The main limitation with the pioneer investor data is the likelihood that some of the abundance values were too low, due to loss of nodules from the FFG. Estimates of abundance that include pioneer investor data are therefore likely to be conservative.

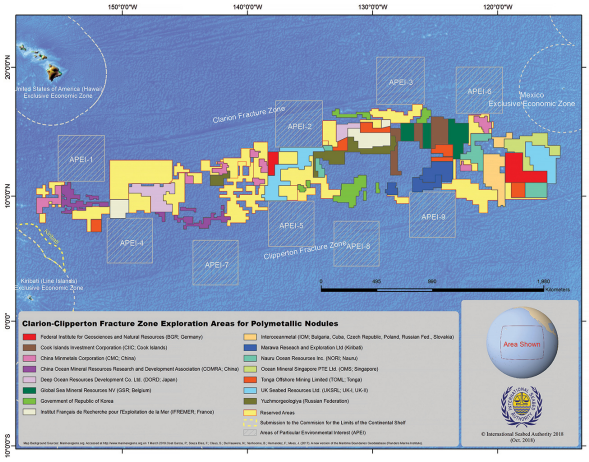
For more information about quality control/quality assurance and data verification, see Section 8 and Section 9 of the NORI Technical Report Summary.

TOML Contract Area

The information that follows relating to the TOML Contract Area of the CCZ is derived, for the most part, from, and in some instances is an extract from, the TOML Technical Report Summary prepared in compliance with the SEC Mining Rules. Portions of the following information are based on assumptions, qualifications and procedures which are not fully described herein. Reference should be made to the full text of the TOML Technical Report Summary, which has been filed as exhibit 96.2 to the registration statement of which this proxy statement/prospectus forms a part. The TOML Technical Report Summary is incorporated herein by reference and made a part hereof.

Location of the TOML Contract Area and access

The TOML Area is located within the CCZ of the northeast Pacific Ocean. The CCZ is located in international waters between Hawaii and Mexico. The western end of the CCZ is approximately 1,000 km south of the Hawaiian island group. From here, the CCZ extends over 4,500 km east-northeast, in an approximately 600 km wide trend, with the eastern limits approximately 2,000 km west of southern Mexico. The region is well-located to ship nodules to the American continent or across the Pacific to Asian markets. The TOML Contract Area comprises six separate blocks (A through F) in the CCZ with a combined area of 74,713 km^2.



TOML Contract Area extents

Area	Minimum Latitude (DD)	Maximum Latitude (DD)	Minimum Longitude (DD)	Maximum Longitude (DD)	Minimum UTM X (m)	Maximum UTM X (m)	Minimum UTM Y (m)	Maximum UTM Y (m)	UTM Zone
A	7.167 N	8.167 N	151.667 W	152.510 W	553972	647187	792205	902968	05N
B	13.580 N	14.667 N	132.000 W	133.200 W	694518	824685	1502009	1623605	08P
C	15.000 N	15.800 N	128.583 W	131.000 W	284947	544791	1658371	1747847	09P
D	13.125 N	14.083 N	123.583 W	125.333 W	247293	437022	1451031	1557860	10P
E	12.750 N	13.083 N	123.583 W	125.333 W	246693	436796	1409563	1447513	10P
F	**9.895 N**	**11.083 N**	**117.817 W**	**118.917 W**	**289835**	**410804**	**1093917**	**1225828**	**11P**

DD — Decimal degrees, UTM — Universal Transverse Mercator map projection

The CCZ lies between Hawaii and Mexico and is accessible by ship from various ports in the United States and South America. As the CCZ deposit does not include any habitable land and is not near coastal waters, there is no requirement to negotiate access rights from landowners for seafloor collection operations. All personnel and material will be transported to the project area by ship. The region is well located to ship nodules to the American continent or across the Pacific Ocean to Asian markets.

See Section 3 of the TOML Technical Report Summary for further specific information of the location of the TOML Contract Area.

Tenements and permits

In March 2020, DeepGreen acquired TOML, a subsidiary of the former Nautilus Minerals Group ("Nautilus"), from Deep Sea Mining Finance Limited, providing exclusive rights to explore a 74,713 km^2 block of the CCZ seabed. TOML holds the TOML Exploration Contract granted by the ISA and sponsored by Tonga. The TOML Exploration Contract was signed on January 11, 2012 between TOML and the ISA and terminates on January 11, 2027, subject to a potential extension under the terms of the agreement.

The TOML Exploration Contract was granted pursuant to the ISA's Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (the "Regulations"), as well as Article 153 of UNCLOS, and formalized a 74,713 km^2 exploration area. The TOML Exploration Contract includes an initial term of 15 years, which may be extended under the contract, and a program of activities to be completed within the first five-year

period of the term. The TOML Exploration Contract also formalized the rights of TOML around future rights. Pursuant to the Regulations, TOML has the priority right to apply for an exploitation contract to collect polymetallic nodules in the same area (Regulation 24(2)).

Pursuant to paragraph 15(a) and (b) of Section 1 of the annex to the 1994 Implementation Agreement, which relates to article 162 (2)(o)(ii) of UNCLOS, the ISA Council must adopt provisional exploitation regulations within two years of a formal request being made by any State which intends to apply for approval of a plan of work for exploitation.

For more information about UNCLOS, the ISA and the TOML Exploration Contract, see "*Information About DeepGreen — Government Regulation — The TOML Exploration Contract*."

TOML obligations and sponsorship

On March 8, 2008, Tonga and TOML entered into the TOML Sponsorship Agreement formalizing certain obligations of the parties in relation to TOML's exploration and potential exploitation of a proposed application to the ISA (subsequently granted) known as the TOML Area. The initial term for the TOML Sponsorship Agreement is 30 years, unless earlier terminated, and the parties may agree to extend the initial term pursuant to the terms of the contract. Upon reaching the minimum recovery level within the tenement area, TOML has agreed to pay Tonga a seabed mineral recovery payment based on the polymetallic nodules recovered from the tenement area. In addition, TOML has agreed to pay the reasonable direct costs incurred by Tonga to administer the ISA obligations of Tonga to the ISA.

Under ISA requirements contractors are required to submit five-year work programs. The first TOML five-year work program was completed in 2016 and reviewed and accepted by the ISA in late 2016.

For the second five-year period ending in 2022, TOML proposed the following program: (i) continue environmental baseline work; (ii) complete pilot testing; (iii) complete geotechnical studies; (iv) complete feasibility studies; (v) first draft EIA/EMP; and (vi) continue training. TOML noted that the program was dependent on success at each stage, subject to change based on findings at hand at any particular time and reliant on funding which in turn is dependent to some extent on macro-economic conditions and development with regards to the authority and its stakeholders.

As a result of the financial state of Nautilus, TOML did not progress at the rate intended until TOML was purchased by DeepGreen in March 2020. TOML currently plans an aggressive program of offshore campaigns from 2021 to 2023 focusing on resource assessment and environmental baseline studies with the objective of upgrading the TOML F resource area to Indicated Mineral Resource status and completing environmental baseline studies and ESIA for the TOML F resource area.

TOML plans to collaborate closely with NORI on offshore technology development as well as progressing in parallel proprietary nodule collection technology developed by TOML. TOML and NORI will collaborate closely on the development of nodule processing solutions.

Royalties and taxes

Royalties and taxes payable on any future production from the TOML Area will be stipulated in the ISA's exploitation regulations. While the rates of payments are yet to be set by the ISA, the 1994 Implementation Agreement (Section 8(1)(b) prescribes that the rates of payments "shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage."

An ad hoc ISA working group workshop has met several times including most recently in February 2020 to discuss a number of potential royalty and taxation regimes supported by modelling conducted by the Massachusetts Institute of Technology. No final recommendations were made. However, a 2% ad valorem royalty increasing to 6% after a period of five years of production was discussed as well as a 1% ad valorem environmental levy.

Under the TOML Sponsorship Agreement between Tonga and TOML, upon reaching the minimum recovery level within the tenement area, TOML has agreed to pay Tonga a seabed mineral recovery payment based on the polymetallic nodules recovered from the tenement area. In addition, TOML has agreed to pay the reasonable direct costs incurred by Tonga to administer the ISA obligations of Tonga to the ISA.

History of previous exploration activities in the TOML Area

Prior to the implementation of UNCLOS, many offshore exploration campaigns were completed by international organizations and consortia. A number of at-sea trial collection operations were successfully carried out in the CCZ in the 1970s to test potential collection concepts. These system tests evaluated the performance of a self-propelled and several towed collection and collection devices, along with submersible pumps and airlift technology for lifting the nodules from the deep ocean floor to the support vessel. Certain pioneer investors include those entities that carried out substantial exploration in the Area prior to the entry into force of UNCLOS, as well as those entities that inherited such exploration data.

Exploration and development efforts in the CCZ started in the 1960s by state sponsored groups from Russia, France, Japan, Eastern Europe, China, Korea and Germany. Several commercial consortia also explored between the 1960s and the 1980s and in some instances their descendants are still involved to the present day. No commercial collection operations have yet been established in the CCZ. However, a variety of collectors, pick-up systems, and metallurgical processing flow sheets were tested, and several integrated “demonstration scale” systems operated in the CCZ for several months in the late 1970s. Processing test-work has encompassed a variety of hydrometallurgical and pyrometallurgical flow sheets, usually with good results.

Six exploration groups are known to have surveyed areas within the TOML Contract Area and collected samples of polymetallic nodules. Much of this work overlapped as it predated the signing of the Law of the Sea. These include the Japanese group (DORD), the South Korean group (KORDI), the Russian Federation group (Yuzhmorgeologiya), the French group (Ifremer), the German group (FIGNR or BGR), and the consortium, Ocean Minerals Company (OMCO). The timing and location (ISA, 2003) of the OMCO sampling is known but the results are not available outside of ISA published contour maps. Virtually all the samples in the TOML tenement area were obtained by free fall grab (FFG) samplers, although a few results from box corers (BC) were also included.

See Section 5 of the TOML Technical Report Summary for further specific information of the history of previous exploration of the TOML Contract Area.

Geology and sampling

Seafloor polymetallic nodules occur in all oceans but the CCZ hosts a relatively high abundance of nodules. The CCZ seafloor forms part of the Abyssal Plains, which are the largest physiographic province on Earth. This mineral field is essentially a single mineral deposit almost 5,000 km in length and up to 600 km wide. The size and level of uniformity of mineralization is unmatched by any mineral deposit of similar value on land. The mechanism of formation of the nodules is interpreted to be essentially identical across the entire CCZ, with only minor local variations. Consequently, there is relatively little difference between the size, shape or metal content of the nodules from one area to another. Figure 6.9 to Figure 6.11 of the TOML Technical Report Summary illustrate the remarkable continuity of grades and abundances across the whole of the CCZ.

The morphological features of the seafloor are similar in the TOML and the NORI Areas, which all lie within the Abyssal Plains and are characterized by sub-parallel basaltic lava ridges called abyssal hills. The Areas are punctuated by typically extinct volcanic knolls and seamounts and scattered sediment drifts in which few nodules are preserved at the seafloor.

Seafloor polymetallic nodules rest on the seafloor at the seawater - sediment interface. Such nodules are composed of nuclei and concentric layers of manganese and iron hydroxides and are formed by precipitation of metals from the surrounding seawater and sediment pore waters. Nickel, cobalt and copper are also precipitated and occur within the structure of the manganese and iron minerals.

The specific conditions of the CCZ (water depth, latitude, and seafloor sediment type) are considered to be the key controls for the formation of polymetallic nodules. Nodules are typically 4 to 6 cm and up to 10 cm in diameter.

The exploration methods used to explore and delineate the mineral resources in the TOML and NORI areas were essentially the same. Multibeam echo-sounding system (MBES) was used to determine the depth of water (bathymetry) and the acoustic reflectance (backscatter) of the seabed. Nodule coverage was interpreted using the backscatter data. Physical sampling of the nodules was carried out initially using FFG samplers and in more recent years by BC samplers which provide a better-quality sample. Measurements of nodule abundance obtained from physical samples were supplemented with estimates of abundance made using the LAE method and high-resolution photographs of the seafloor.

Data collected by TOML in 2013 and 2015 supports the historical data but also is of sufficient quantity and quality to allow estimation of an indicated mineral resource for five sub areas within TOML Areas B, C, D and F called B1, C1, D1, D2 and F1. More detailed data collected by TOML has also allowed estimation of a measured mineral resource for a single sub area within TOML Area B.

The key data sets behind the inferred mineral resource estimate for TOML Areas A through E are surface samples obtained by free fall grab samplers, although a few results from box-corers were also included. Free fall grab samplers are the standard sampling method as they are the most productive tool available. They are believed to underestimate the actual abundance, as smaller nodules may escape some grabs during ascent and larger nodules around the edge of the sampler may be knocked or fall out during the sampling process. This may introduce some conservatism to the inferred mineral resource estimates.

The key data behind the inferred mineral resource estimate for TOML Area F and the indicated and measured mineral resources are box-corers and measured photographs. Box-corers take longer to collect than free fall grab samplers, but they are believed to have less bias. Photos cover a much greater area than either free fall grabs or box-cores. The weight of individual nodules can be accurately estimated from the length of their long or major axis; a relationship first discovered in the 1970s. Using the box-core samples as calibration devices, TOML was able to measure the size of nodules on several hundred photographs in Areas B and C. Abundance is shown to be related both to nodule coverage in photos and to acoustic response (backscatter) from regional survey. These data thus provide very detailed indications of nodule abundance and continuity.

Many of the records of the sampling procedures used by the pioneer contractors were not available to the Qualified Persons, but it is likely that all of the pioneer contractors followed similar procedures to that used by TOML. Nodule abundance (wet kg/m^2) was derived by dividing the weight of recovered nodules by the surface area covered by the open jaws of the sampler or corer (typically 0.25 to 0.75 m^2). A split of the nodules was dried, crushed and ground to enable grade determination via standard analytical methods (typically atomic absorption spectrometry, X-ray fluorescence or inductively coupled plasma methods), either on the vessel or back on shore. Specific nodule chemical standards were used for instrument calibration. TOML also present the results of field, submitted and laboratory duplicates of nodule samples.

Analysis of the data revealed that, as a consequence of their origin, nodule grades vary only slightly across the CCZ, with spatial continuity of the abundance, Mn, Ni, Co, and Cu grades often ranging from the order of several kilometers up to several tens of kilometers. Nodule abundance is sometimes less continuous than grade, as it is also subject to local changes in net sedimentation (a consequence of seafloor slope, slumping, erosion and local currents).

For more information about the TOML exploration campaigns in 2013 and 2015, see Section 7 of the TOML Technical Report Summary.

Mineral resource estimate

The mineral resource was classified on the basis of the quality and uncertainty of the sample data and sample spacing, in accordance with the definitions of “inferred mineral resource,” “indicated mineral resource” and “measured mineral resource” under the SEC Mining Rules.

Estimation of tonnage and grade for the TOML Contract Area within the CCZ was undertaken using only sample data within the TOML Contract Area in the second quarter of 2016. The estimates are based on the historical box-core and free fall-grab nodule sampling (262 samples) supplemented with recently acquired TOML nodule box core (113 samples) and photo-profile data (20,857 frames over 587 line km). Only sample data within the TOML Contract Area was used to inform the estimates.

Six block models were constructed using the geostatistical modelling programs Gstat 1.1-3 and R 3.2.5, one for each TOML Exploration Area (A to F), in three passes. The first pass used a parent block dimension of 1.75 km by 1.75 km and filled the areas defined as measured mineral resource. The second pass for indicated mineral resource used a parent block size of 3.5 km by 3.5 km while the third pass for inferred mineral resource used a parent block size of 7.0 km by 7.0 km.

The modelling methodology used for estimating the mineral resource was determined through careful consideration of the scale of deposit, mechanism of nodule formation, geological controls and nature of the sampling method. The approach involved estimating nodule abundance and grades into a two-dimensional block model with abundance used for calculating tonnage. Abundance and grades were estimated using Ordinary Kriging (OK) with comparison (not reported) estimates using Inverse Distance Weighting (IDW) and nearest neighbor. The modelling methodology is similar to the method applied by the ISA (2010) for its global estimate which was produced by a multi-disciplinary effort that involved recognized subject matter experts.

The historical nodule sample data is considered suitable for the purpose of estimating mineral resources to an inferred level of confidence. The Qualified Person also considers that the combination of the TOML and historical nodule sample data (physical samples and photo based long axis estimates) combined with detailed backscatter, photo profiling and geological interpretation is sufficient to estimate polymetallic nodule indicated mineral resources and, in one small especially data rich area, measured mineral resources.

Inferred mineral resource classification was based on sampling by pioneer contractors on a nominal spacing of 20 km, the variation and uncertainty in the sample quality, and the likely presence of short-range variation to nodule abundance.

Indicated mineral resource classification was based on box core sampling by TOML on a nominal spacing of approximately 7 km by 7 km (including photo profiling in some cases at 7 km by 3 km), supplemented by sampling by pioneer contractors.

Measured mineral resource was based on box core sampling by TOML on a nominal spacing of approximately 7 km by 7 km plus photo-profiling on a nominal spacing of 3.5 km by 3.0 km, supplemented by sampling by pioneer contractors.

The mineral resource estimate for the TOML Contract Area, with an effective date of December 31, 2020, and at a 4 kg/m^2 abundance cut-off is set forth below.

Mineral Resource Estimate, In-Situ, for the TOML Contract Area within the CCZ at a 4 kg/m^2 nodule abundance cut-off

Mineral Resource Classification	Tonnes (x10^6 wet t)*	Abundance (wet kg/m^2)	Ni (%)	Cu (%)	Co (%)	Mn (%)
Measured	2.6	11.8	1.33	1.05	0.23	27.6
Indicated	69.6	11.8	1.35	1.18	0.21	30.3
Measured + Indicated	72.2	11.8	1.35	1.18	0.21	30.2
Inferred	696	11.3	1.29	1.14	0.20	29.0

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 28% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

* Variations in totals are due to rounding of individual values. Mn, Ni, Cu and Co assays on samples dried at 105˚C

The TOML Contract Area has sufficient samples of adequate quality to define a mineral resource for Mn, Ni, Cu and Co. The estimate of abundance and hence tonnage for the inferred mineral resource for the TOML Contract Area may be biased low due to reliance on free fall grab samples in places.

The 2020 mineral resource estimate (measured, indicated and inferred mineral resources), which was informed by data collected by TOML in 2013 and 2015, is presented in Table 11.9 of the TOML Technical Report Summary.

Due to the extremely low variance in the grades and the high metal content of the nodules, a cut-off based on abundance is appropriate for determining the limits of economic exploitation. A cut-off of 4 kg/m^2 abundance was chosen for the TOML Contract Area, based on the estimates of costs and revenues presented in the initial assessment

contained in the NORI Technical Report Summary. The metal prices assumed in the calculation of the cut-off were: nickel metal $16,472/t; nickel in nickel sulphate $18,807/t Ni; copper metal $6,872/t; cobalt metal $46,333/t; cobalt in cobalt sulphate $56,920/t Co; manganese in manganese silicate $4.50/dmtu. The price estimates are long term (2034 – 2046) forecasts provided in a report by CRU International Limited (CRU, 2020). The Qualified Person considers that this timeframe is reasonable in view of the likely time required to bring the majority of the TOML mineral resources into production.

The initial inferred mineral resource for the TOML Contract Area was reported on March 20, 2013 by Golder Associates. The changes in the 2020 mineral resource estimate from 2013 for the TOML Contract Area are due to:

- the inclusion of Areas E and F for the first time, and high abundances and grades in Area F;
- additional nodule abundance sample information (from box core and photo profile) collected during the 2015 campaign;
- setting the abundance estimates within the no nodule domain to zero in areas covered by MBES (TOML Areas B, C, D, E, F);
- the use of ordinary kriging (rather than inverse distance weighting) supported by short-range variogram to estimate abundance; and
- changes in block model parent cell size related to improved sample spacing.

Comparison of the 2013 inferred mineral resource estimate and the 2020 estimate shows that the additional data has increased the total mineral resource tonnage by 3%. In the areas with the most new data (the indicated and measured areas), abundance and grades are all higher in the new model than the 2013 model. These changes show that it is reasonable to expect that the majority of inferred mineral resources could be upgraded to indicated or measured resources with further exploration.

Information concerning our mineral properties in the TOML Technical Report Summary and in this proxy statement/prospectus includes information that has been prepared in accordance with the requirements of the SEC Mining Rules set forth in subpart 1300 of Regulation S-K. Under SEC standards, mineralization, such as mineral resources, may not be classified as a “reserve” unless the determination has been made that the mineralization could be economically and legally produced or extracted at the time of the reserve determination. As used in this proxy statement/prospectus, the terms “mineral resource,” “measured mineral resource,” “indicated mineral resource” and “inferred mineral resource” are defined and used in accordance with the SEC Mining Rules set forth in subpart 1300 of Regulation S-K. **You are specifically cautioned not to assume that any part or all of the mineral deposits in these categories will ever be converted into mineral reserves, as defined by the SEC.**

You are cautioned that mineral resources do not have demonstrated economic value. Inferred mineral resources have a high degree of uncertainty as to their existence as to whether they can be economically or legally mined. Under the SEC Mining Rules, estimates of inferred mineral resources may not form the basis of an economic analysis. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. A significant amount of exploration must be completed in order to determine whether an inferred mineral resource may be upgraded to a higher category. **Therefore, you are cautioned not to assume that all or any part of an inferred mineral resource exists, that it can be economically or legally mined, or that it will ever be upgraded to a higher category. Likewise, you are cautioned not to assume that all or any part of measured or indicated mineral resources will ever be upgraded to mineral reserves.**

Reasonable prospects for economic extraction

The morphological features of the seafloor are similar in the TOML and the NORI Areas, which all lie within the Abyssal Plains and are characterized by sub-parallel basaltic lava ridges called abyssal hills. The Areas are punctuated by typically extinct volcanic knolls and seamounts and scattered sediment drifts in which few nodules are preserved at the seafloor.

The exploration methods used to explore and delineate the mineral resources in the TOML and NORI areas were essentially the same. MBES was used to determine the depth of water (bathymetry) and the acoustic reflectance (backscatter) of the seabed. Nodule coverage was interpreted using the backscatter data. Physical sampling of the

nodules was carried out initially using FFG samplers and in more recent years by BC samplers which provide a better- quality sample. Measurements of nodule abundance obtained from physical samples were supplemented with estimates of abundance made using the LAE method and high- resolution photographs of the seafloor.

The sample preparation and assaying procedures used in the TOML and NORI Areas were essentially the same. The pioneer investor data lacks some supporting information but all studies to date indicate that the pioneer investor data is reliable. In both Areas, high standards of quality assurance/quality control were applied to the exploration programs that were carried out by TOML and NORI. The assay data are supported by the results of certified reference materials, duplicate samples, blank samples, and duplicate analyses at a second laboratory. Sample security was of a high standard and the Qualified Persons consider that there was negligible risk of interference with the samples.

The development plan for commercial development of polymetallic nodule deposits in the CCZ were studied as described in the NORI Technical Report Summary. The commonality between the polymetallic nodule deposits in NORI Area D and the TOML Contract Area indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Contract Area.

Collection methods

Recovery and collection methods that could be employed for commercial development of polymetallic nodule deposits in the CCZ were studied as described in the NORI Technical Report Summary. The commonality between the polymetallic nodule deposits in NORI Area D and the TOML Contract Area indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Contract Area. This is discussed further in Section 11.9.4 of the TOML Technical Report Summary, which assessed the following collection methods.

The main items of off-shore infrastructure are the nodule collector vehicles, the riser, and three production support vessels (PSV).

The nodules are expected to be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection. The collectors are expected to be remotely controlled and supplied with electric power via umbilical cables from the PSV. Suction dredge heads on each collector are expected to recover a dilute slurry of nodules, sediment, and water from the seafloor. A hopper on each vehicle is expected to separate sediment and excess water, which is expected to pass out of the hopper overflow, from the nodules, which is expected to be pumped as a higher concentration slurry via flexible hoses to a riser.

The riser is a steel pipe through which nodules are expected to be transferred to the surface by means of an airlift. The riser is expected to consist of three main sections. The lower section is expected to carry the two-phase slurry of nodules and water from the collectors to the airlift injection point. The mid-section is expected to carry a three-phase mixture of slurry and air. This section is expected to also include two auxiliary pipes: one to carry the compressed air for the airlift system, and one to return water from dewatering of the slurry to its subsea discharge point. The upper section of riser is expected to have a larger diameter to account for the expansion of air in the airlift.

The airlift works by lowering the average density of the slurry inside the riser to a level lower than seawater. The difference between the hydrostatic pressure of the seawater at depth and the pressure caused by the weight of the low-density three-phase slurry column inside the riser forces the slurry column to rise. The energy to achieve the lift is expected to be supplied by compressors housed on the PSV, which is expected to be capable of generating very high air pressures.

The PSVs are expected to each support a riser and lift system (RALS) and its handling equipment, and are expected to house the airlift compressors, collector vehicle control stations, and material handling equipment. All power for off-shore equipment, including the nodule collecting vehicles, is expected to be generated on the PSVs. The PSVs are expected to be equipped with controllable thrusters and are expected to be capable of dynamic positioning (DP), which are expected to allow the vessels and risers to track the collectors. Nodules are expected to be discharged from the RALS to the PSVs, where they are expected to be dewatered and temporarily stored or transferred directly to a transport vessel. A preliminary assessment of the transportation fleet for transfer of nodules from the CCZ to an existing deep-water industrial port equipped with bulk offloading facilities was examined.

The TOML Technical Report Summary assumed that chartered vessels with 35,000 to 100,000 tonne deadweight capacities would be used to transport the dewatered nodules to the port of Lazaro Cardenas, Michoacan, Mexico, 960 nm from the NORI Area D reference site. The vessels are expected to be converted bulk mineral carriers with dynamic positioning (DP) to allow tracking behind the production support vessels during operations. The method of offloading, known as tandem offloading, is well established for offloading of oil production vessels in remote areas of the world.

Mineral processing and metallurgical testing

The polymetallic nodules in the TOML and NORI Areas have similar morphological, mineralogical, and grade characteristics. As noted in Section 10 of the TOML Technical Report Summary, all published historical work indicates that processing of nodules is technically feasible.

The commonality between the polymetallic nodule deposits in NORI Area D and TOML Contract Area indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Contract Area. This is discussed further in Section 11.9.5 of the TOML Technical Report Summary, which assessed the following mineral processing scenario.

The first part of the pyrometallurgical process is the Rotary Kiln Electric Furnace (RKEF) process that is widely used in the nickel laterite industry. The second pyrometallurgical step (sulphidization of the alloy produced in the first step to form a matte and then partially conversion in a Peirce-Smith converter to remove iron), while not widely practiced, also has commercial precedent at the Doniambo plant of Societe Le Nickel in New Caledonia.

Sulphuric acid leaching of matte from the pyrometallurgical process has precedent in the platinum group minerals (PGM) industry. Although copper producers typically have a solvent extraction step before electrowinning of their copper, direct copper electrowinning is done in most PGM refineries, where nickel and cobalt are also significant pay-metals. This is to maximize nickel recovery and minimize operating expenses. The nickel and cobalt are expected to be purified using solvent extraction, ion exchange and precipitation, which are all commercially proven hydrometallurgical processes. Battery grade nickel and cobalt sulphate are expected to then be crystallized from the purified solutions.

The pyrometallurgical process is expected to form two byproducts as well as the matte for the hydrometallurgical refinery:

- an electric furnace slag containing silica and 53% MnO that is intended to be sold as feed to the Si-Mn industry; and
- a converter aisle slag that could be used for aggregate in road construction or other applications.

The hydrometallurgical refinery is expected to generate iron residues that would, for a stand-alone plant, require disposal. However, these streams can be recycled back to the pyrometallurgical plant for re-treatment and recovery of entrained pay metals.

Selection of ammonia as a principal reagent in the hydrometallurgical refinery means that an additional by-product — ammonium sulphate — may be generated. This could be sold into the fertilizer industry.

The copper cathode quality from direct electrowinning, without a solvent extraction step, is expected to be ≥99.9% Cu. Quality of the matte produced in the pyrometallurgical plant will have an impact on this, including the potential carryover of impurities beyond values assumed for the purpose of the IA.

The production of battery-grade nickel and cobalt sulphates is targeted instead of nickel or cobalt cathodes or other intermediate products.

In summary:

- All parts of the proposed process have commercial precedents in similar or analogous industries, however not as a whole continuous flowsheet.
- Pay-metals are recovered in the following forms:
- Copper cathodes with an expected quality of ≥99.9% Cu.

- Battery-grade nickel sulphate.
- Battery-grade cobalt sulphate.
- Rather than generating large waste streams, the process is expected to produce by-products including high manganese content furnace slag and ammonium sulphate.

The process assumptions used in this TOML Technical Report Summary will need to be verified as the project proceeds.

For more information on mineral processing and metallurgical testing, see Section 10 of the TOML Technical Report Summary.

Environmental studies, permitting, community, or social impact

Historically, a significant amount of technical work has been undertaken within the CCZ by the contractors under the ISA and a significant body of information has been acquired during the past 40 years on the likely environmental impacts of collecting nodules from the sea floor.

TOML's offshore exploration campaigns have included sampling to support environmental studies, collection of high-resolution imagery and environmental baseline studies. A number of future campaigns are planned to collect data on ocean currents and water quality to assist plume modelling, environmental baseline studies, box core and multicorer sampling focused on benthic ecology and sediment characteristics.

The social impacts of the offshore operation are expected to be positive. The CCZ is uninhabited by people, and there are no landowners associated with the TOML Areas. No significant commercial fishing is carried out in the area. The project is expected to provide a source of revenue to the sponsor country, Tonga, and to the ISA.

The onshore environmental and social impacts have not yet been assessed because the process plant has not been designed in detail, and the location and host country (and hence regulatory regime) not confirmed. The planned metallurgical process is not expected to generate solid waste products.

For more information on environmental studies, permitting and social or community impact, see Section 17 of the TOML Technical Report Summary.

Internal controls and data verification

Data collected by TOML in 2013 and 2015 supports the historical data but also is of sufficient quantity and quality to allow estimation of an indicated mineral resource for five sub areas within TOML Areas B, C, D and F. More detailed data collected by TOML has also allowed estimation of a measured mineral resource for a single sub area within TOML Area B. Chain of custody, sample security, Quality Assurance and Quality Control were documented in detail for the TOML data.

The database provided by the ISA contains multiple independent datasets that were independently collected and sampled using similar methods (FFG or BC sampling) but with slightly different equipment and were assayed by different laboratories. Because the database contains multiple datasets the datasets can be compared with each other for the purpose of validating the internal consistency of the data. Additionally, there are a number of published summaries of data that have not been provided to the ISA but show similar mean grades to the data within the TOML Exploration Area.

The sample data are supported by independent third-party data, have been reviewed by the ISA LTC during the process of granting licenses to the Pioneer Contractors, and are maintained by the independent ISA.

The database includes all data submitted to the ISA that were collected in the Reserved Areas of the CCZ. The data were collected by parties completely independent of TOML or Nautilus Minerals and retained exclusively in the custody of the ISA prior to their transfer. The data sets were also subject to third party review by the ISA's LTC, as part of the process of granting Pioneer Contractors Exploration Areas.

The original assay sheets from the laboratories for the individual nodule samples within the TOML Contract Area are not available. Neither are the quality control procedures used by the laboratories and the ISA. It is reasonable to infer that the historical data is of sufficient quality for an Inferred Mineral Resource estimate because:

- The ISA is an independent agency with significant accountability under the Law of the Sea. Part of its mandate is the receipt and storage of sea floor sampling data suitable for the estimation of nodule resources and the legally binding award of licenses. It is reasonable to assume that a reasonable level of care was applied by the ISA.
- Comparison of the six independent data sets from the CCZ shows a high level of consistency in abundance and grade and, conversely, provides no evidence of bias or systematic error in the TOML data.
- Recent TOML nodule sampling confirms the existence, and abundance and grade continuity of the polymetallic nodules within the TOML Exploration Areas.

The Qualified Person considers that the combination of the TOML and historical nodule sample data (physical samples and photo based long axis estimates) combined with detailed backscatter, photo profiling and geological interpretation is sufficient to estimate polymetallic nodule indicated mineral resources and, in one small especially data rich area, measured mineral resources.

The primary characteristic of the polymetallic nodule deposit that separates this deposit from typical terrestrial manganese, nickel and copper deposits is that the nodules themselves can be accurately mapped through photo-profiles and backscatter acoustic response. The bulk of the polymetallic nodules sit on top of the seabed allowing them to be photographed. However, in some areas such as TOML Area D some nodules are partially covered by sediment making it more difficult to detect the presence and abundance of the nodules. The most accurate method for determining nodule abundance is through physical sampling by box-core or free fall-grab sampling. However, these methods are costly and result in wide sample spacing. Due to the fact that nodules are visible, photography can be used in many areas to estimate nodule abundance directly. The two methods for doing this are estimating the nodule percent coverage (percent of exposed nodule surface area within the photo) and measuring each individual nodule long-axis and then using these measurements to calculate abundance using variants of the formula defined by Felix (1980). The long-axis estimation (LAE) method is the most accurate and preferred method but comes at a cost in the time to manually process each photo - limiting the number of photos that can be used for estimating abundance. The benefit of using photographs is being able to demonstrate continuity between physical sample location and accurately quantify nodule abundance. TOML is developing an automated method of doing these measurements for future application.

The Qualified Person considers the abundance estimates derived from photographs to date from TOML Areas B and C, to be suitable for estimating nodule abundance for the mineral resource.

For more information about quality control/quality assurance and data verification, see Section 8 and Section 9 of the TOML Technical Report Summary.

EXECUTIVE AND DIRECTOR COMPENSATION OF DEEPGREEN

Introduction

This section provides an overview of DeepGreen's executive compensation programs, including a narrative description of the material factors necessary to understand the information disclosed in the summary compensation table below.

We are currently considered a "smaller reporting company" within the meaning of the Securities Exchange Act of 1934 for purposes of the SEC's executive compensation disclosure rules. Accordingly, we are required to provide a Summary Compensation Table and an Outstanding Equity Awards at Fiscal Year End Table, as well as limited disclosures regarding executive compensation for our last two completed fiscal years. Further, our reporting obligations extend only to the following "Named Executive Officers" or "NEOs," which are the individuals who served as principal executive officer and the next two most highly compensated executive officers for the fiscal year ended December 31, 2020. As of December 31, 2020, DeepGreen's NEOs were:

- Gerard Barron, Chief Executive Officer;
- Anthony O'Sullivan, Chief Development Officer, and
- Erika Ilves, Head of Strategy and Business Development.

The objective of DeepGreen's compensation program is to provide a total compensation package to each NEO that will enable DeepGreen to attract, motivate and retain outstanding individuals, align the interests of the TMC executive team with those of its equity holders, encourage individual and collective contributions to the successful execution of its short- and long-term business strategies and reward NEOs for performance. The DeepGreen Board has historically determined the compensation for the NEOs.

For 2020, the compensation program for the NEOs consisted of a base salary as described below:

- **Base Salary.** Base salary is paid to attract and retain qualified talent and is set at a level that is commensurate with the executive's duties and authorities, contributions, prior experience and sustained performance.

Summary Compensation Table

The following table shows information concerning the annual compensation for services provided to DeepGreen by our NEOs for the fiscal year ended December 31, 2020.

Name and Principal Position	Year	Salary ($)	All Other Compensation ($)[1]	Total ($)
Gerard Barron, *Chief Executive Officer*	2020	565,000	—	565,000
Anthony O'Sullivan, *Chief Development Officer*	2020	475,000	12,710	487,710
Erika Ilves, *Head of Strategy and Business Development*	2020	395,000	—	395,000

(1) Consists of payments made by DeepGreen pursuant to Australia's superannuation system on behalf of Mr. O'Sullivan during the year ended December 31, 2020.

Outstanding Equity Awards at 2020 Fiscal Year-End

The following table sets forth certain information regarding outstanding equity awards held by the NEOs as of December 31, 2020.

Name	Number of Securities Underlying Unexercised Options Exercisable (#)	Number of Securities Underlying Unexercised Options Unexercisable (#)	Option Exercise Price ($)	Option Expiration Date
Gerard Barron	2,400,000	600,000	$ 0.75	06/01/2028
Anthony O'Sullivan	1,750,000	—	$ 0.75	06/01/2028
Erika Ilves	950,000	—	$ 0.75	06/01/2028

Employment Arrangements

DeepGreen entered into an employment agreement with Mr. Gerard Barron on January 1, 2018, an employment agreement with Mr. Anthony O'Sullivan on July 25, 2017, and an employment agreement with Ms. Erika Ilves on September 1, 2018, each in connection with their services as executive officers with DeepGreen, the material terms of which are described below. In addition, each named executive officer has agreed to non-competition, non-solicitation and non-interference covenants that apply during the term of employment and for 12 months thereafter, as well as assignment of intellectual property and confidentiality obligations, each as set forth in his or her respective employment agreement.

Mr. Barron began his current position as DeepGreen's Chief Executive Officer in January 2018. Mr. O'Sullivan began his current position as DeepGreen's Chief Development Officer in July 2017. Ms. Ilves began her current position as Head of Strategy and Business Development in September 2018.

Gerard Barron

DeepGreen entered into an employment agreement with Mr. Barron, who accepted and commenced his role as DeepGreen's Chief Executive Officer on the agreement effective date, January 1, 2018 (the "Barron Employment Agreement"). Under the Barron Employment Agreement, Mr. Barron's initial annual base salary was $450,000, which DeepGreen agreed to review on a year-to-year basis, in accordance with DeepGreen's payroll practices. In addition, DeepGreen issued Mr. Barron up to 250,000 common shares, upon the execution of the Barron Employment Agreement, to be paid in lieu of cash for services provided by Mr. Barron from July 2017 through November 2017. As DeepGreen's Chief Executive Officer, Mr. Barron is eligible to participate in DeepGreen's benefit plans and to be considered for an annual performance incentive bonus, to be granted at the discretion of the Board on a year-to-year basis (the "Employment Bonus"). Under the Barron Employment Agreement, if Mr. Barron is deemed eligible to receive an Employment Bonus for a particular year, then the terms of such Employment Bonus shall be provided under a separate agreement, and paid as soon as practicable after the first quarter of the first financial year following the year that Mr. Barron earns such bonus.

Pursuant to the Barron Employment Agreement, Mr. Barron also received an option grant for 3,000,000 shares of DeepGreen common shares, at an exercise price of $0.75 per share, subject to the terms and conditions set forth in a stock option agreement between the parties, dated July 23, 2018 (the "Barron Stock Option Agreement"). Under the Barron Stock Option Agreement, the parties agreed that (i) 2,500,000 options would be issued as part of DeepGreen's Long-Term Incentive Plan, with (x) 60% of such shares vesting in equal 20% installments on each of January 1, 2019, January 1, 2020 and January 1, 2021, and (y) 20% of such shares vesting upon the DeepGreen raising $20,000,000 in cash following the date of grant and (z) 20% of such shares vesting upon DeepGreen raising a total of $40,000,000 in cash following the date of grant, provided that Mr. Barron remained an employee of DeepGreen on such dates, and (ii) 500,000 options would be issued as part of Mr. Barron's Board remuneration, with 50% of such shares vesting as of the grant date and 50% of such shares vesting as of January 1, 2019. Any vested options under the Barron Stock Option Agreement are set to expire on June 1, 2028. All stock options granted to Mr. Barron are governed by the terms of DeepGreen's stock option plan, dated June 1, 2018, as amended from time to time (the "Option Plan"), as well as the Barron Stock Option Agreement. In the event that Mr. Barron's employment with DeepGreen is terminated without cause, Mr. Barron will receive a payment equal to

either (i) 3 months of his then annual base salary, or (ii) in the event that DeepGreen had raised (y) $20,000,000 in equity as of January 1, 2018 and (z) DeepGreen has greater than $10,000,000 cash-on-hand as of the date of such termination, then Mr. Barron shall receive an amount equal to 12 months of his base salary as a salary continuance in accordance with the Barron Employment Agreement and DeepGreen's standard monthly payroll practices (the "Barron Severance Benefits"). In the event that, following a change of control of DeepGreen, Mr. Barron is terminated without "cause" or resigns as a result of a "triggering event," Mr. Baron will also be eligible to receive the Barron Severance Benefits.

Anthony O'Sullivan

DeepGreen entered into an employment agreement with Mr. O'Sullivan, who accepted and commenced his role as DeepGreen's Chief Development Officer on July 25, 2017 (the "O'Sullivan Employment Agreement"). Pursuant to the terms of the O'Sullivan Employment Agreement, Mr. O'Sullivan's initial annual base salary was equal to AUD$400,000, less applicable deductions (including Australian PAYG withholding tax or such other withholding tax applicable to the jurisdiction in which Mr. O'Sullivan resides at the time). DeepGreen agreed to review the initial annual base salary on a year-to-year basis in accordance with the terms of the agreement. Mr. O'Sullivan is eligible to participate in DeepGreen's employee benefit plans, short-term incentive plan and the long term incentive plan. In connection with his hiring, Mr. O'Sullivan was granted certain stock options pursuant to the Option Plan. Subject to the terms and conditions set forth by that certain stock option agreement, made effective July 23, 2018, by and between DeepGreen and Mr. O'Sullivan (the "Sullivan Stock Option Agreement"), Mr. Sullivan was granted 1,750,000 common shares at an exercise price of $0.75 per share, subject to (i) thirty-four percent (34%) of the shares vesting as of the grant date, (ii) thirty-three percent (33%) of the shares vesting on June 1, 2019, and (iii) thirty-three percent (33%) of the shares vesting on June 1, 2020, provided that Mr. O'Sullivan remains an employee of DeepGreen on such dates. The vested options are set to expire on June 1, 2028 under the vesting and expiration conditions of the Sullivan Stock Option Agreement. In the event that Mr. O'Sullivan's employment with DeepGreen is terminated, then any unvested options will expire on the Termination Date. If Mr. O'Sullivan's employment with DeepGreen is terminated without "cause" or, within six months following a change of control of DeepGreen, Mr. O'Sullivan experiences a "triggering event," Mr. O'Sullivan will receive any earned, but unpaid, annual bonus.

Erika Ilves

DeepGreen entered into an employment agreement with Ms. Ilves, who accepted and commenced her role as DeepGreen's Head of Strategy and Business Development on September 1, 2018 (the "Ilves Employment Agreement"). Pursuant to the terms of the Ilves Employment Agreement, Ms. Ilves' initial annual base salary was $180,000, which would increase to $300,000 per annum, effective January 1, 2019. As a DeepGreen employee, Ms. Ilves is eligible to participate in DeepGreen's employee benefit plans, short term incentive plan and long term incentive plan. In connection with her hiring, Ms. Ilves was granted certain stock options under the Option Plan, subject to the terms and conditions set forth by her stock option agreement with DeepGreen, dated September 1, 2018 (the "Ilves Stock Option Agreement"). Under the Ilves Stock Option Agreement, Ms. Ilves was granted 950,000 common shares, at an exercise price of $0.75 per share, subject to (i) thirty-four percent (34%) of the shares vesting as of the grant date, (ii) thirty-three percent (33%) of the shares vesting on September 1, 2019, and (iii) thirty-three percent (33%) of the shares vesting on September 1, 2020. The vested options are set to expire on June 1, 2028 under the vesting and expiration conditions of the Ilves Stock Option Agreement. If Ms. Ilves' employment with DeepGreen is terminated without "cause" or, within six months following a change of control of DeepGreen, Ms. Ilves experiences a "triggering event," Ms. Ilves will receive any earned, but unpaid, annual bonus.

A "triggering event" is generally defined under the employment agreements as a material adverse change to any of the employee's duties, powers or title as they existed immediately prior to a change of control, a material adverse change in the office or body to whom the employee reports immediately prior to a change in control, the employee being required to work more than 50 km from the employee's primary place of work, or a material adverse change in the employee's remuneration.

Employee Benefits

DeepGreen's NEOs participate in employee benefit programs available to its employees generally. DeepGreen did not maintain any executive-specific benefit or perquisite programs in 2020.

Stock Option Plan and Stock Option Awards

The DeepGreen Board adopted, and DeepGreen's shareholders approved, the DeepGreen Metals Inc. Stock Option Plan (the "Option Plan") on September 17, 2013. The Option Plan has been periodically amended, most notably: on July 23, 2018 in order to increase the number of shares of DeepGreen common shares available for issuance pursuant to the Option Plan to a maximum of 20% of the issued and outstanding common shares, on May 16, 2019 in order to clarify the application with respect to certain provisions of employee scheme legislation in Australia. The Option Plan permits the grant of options of DeepGreen's common shares, as defined by the Option Plan (the "Options"). Options may be granted only to (i) a *bona fide* director, senior officer, employee of DeepGreen, (ii) a company that is wholly-owned by any of the foregoing, or (iii) a consultant of DeepGreen. Following the Business Combination, the Board, in its sole discretion, may accelerate the vesting of any unexercised options in accordance with the change of control provisions set forth in the Option Plan.

The DeepGreen Board is authorized to administer the Option Plan. In addition, consistent with the terms of the Option Plan, the DeepGreen Board may determine the number of shares issuable for the exercise of each Option, the Option Price, as defined by the Option Plan, and the times when any such Options will be granted, exercisable and expire under the Option Plan. Following the Business Combination, no further awards will be granted pursuant to the Option Plan.

Upon any time when an Option granted under the Option Plan remains unexercised with respect to any common shares and a transaction is proposed that the majority of the Board determines is reasonably likely to be considered a Change of Control Event, as defined by the Option Plan (a "Change of Control Event"), then the Board, in its sole discretion, may require that: (i) DeepGreen accelerate the vesting of the Option and the time for the fulfilment of any conditions or restrictions on such vesting; (ii) the Option granted under the Option Plan be exercised (whether or not such Option has vested at any time up to and including (but not after) the effective time of the Change of Control Event, and any Options not exercised by the effective time of the Change of Control Event will be deemed to have expired; (iii) the Option granted under the Option Plan, if acceptable by the holder, be cancelled by DeepGreen for a cash payment equal to the difference between (y) the closing price of such shares on a trading day that is a determined number of days prior to the effective time of the Change of Control Event and (z) the price of the Option; or (iv) the Option granted under the Option Plan be exchanged for an Option to acquire the number of securities as are distributed to the securityholders of DeepGreen equal to (y) the exchange ratio of the shares multiplied by (z) the number of shares subject to such Option immediately prior to the effective time of the Change of Control Event, provided that any such replacement Option survives for a period of not less than one year from the effective time of the Change of Control Event, regardless of the continuing directorship, officership or employment of the holder.

The DeepGreen Board may amend, suspend, or terminate the Option Plan at any time. The DeepGreen Board must obtain shareholder approval of any plan amendment to the extent required by the Option Plan.

TMC Incentive Equity Plan

Please see "*The Incentive Award Plan Proposal*" for a description of the TMC 2021 Incentive Equity Plan.

Director Compensation

DeepGreen currently has no formal arrangements under which executive directors receive annual compensation for their service on DeepGreen Board. Non-executive directors do receive compensation for their service on the board.

The table below summarizes the compensation of each person serving as a DeepGreen non-employee director for the fiscal year ended December 31, 2020. Gerard Barron, DeepGreen's Chief Executive Officer, did not receive any additional compensation for his service as a director in 2020. The compensation of Mr. Barron as a named executive officer is set forth above under "*DeepGreen's Executive Compensation — Summary Compensation Table*."

Name	Fees Earned or Paid in Cash ($)	Option Awards ($)[1]	All Other Compensation ($)	Total ($)
Jonas Munch Agerskov	$ 60,000	$ —	$ —	$ 60,000
Andrei Karkar	$ —	$ —	$ —	$ —
Paul Matysek	$ 70,000	$ —	$ —	$ 70,000
Brian Paes-Braga	$ 65,000	$ —	$ —	$ 65,000

(1) The amounts in this column represent the aggregate grant-date fair value of awards granted to each director, computed in accordance with the FASB's ASC Topic 718. See Note 2 to DeepGreen's audited consolidated financial statements included elsewhere in this proxy statement/prospectus/information statement for a discussion of the assumptions made by DeepGreen in determining the grant-date fair value of DeepGreen's equity awards.

The following lists all outstanding equity awards held by non-employee directors as of December 31, 2020:

Name	Aggregate Number of Shares Underlying Outstanding Options[1]
Jonas Munch Agerskov	—
Andrei Karkar	500,000
Paul Matysek	500,000
Brian Paes-Braga	500,000

(1) Such awards are fully vested, and have an exercise price of $0.75 and an expiration date of June 1, 2028.

Post-Business Combination TMC Executive Officer and Director Compensation

Prior to or following the Closing, DeepGreen or TMC intends to develop an executive compensation program that is designed to align compensation with TMC business objectives and the creation of shareholder value, while enabling TMC to attract, motivate and retain individuals who contribute to the long-term success of TMC. DeepGreen or TMC intends to enter into employment agreements with its executive officers that are consistent with that program. Following the Closing, decisions on the executive compensation program will be made by the compensation committee of the board of directors. Prior to or following the Closing, DeepGreen or TMC also intends to develop a board of directors' compensation program that is designed to align compensation with TMC's business objectives and the creation of shareholder value, while enabling TMC to attract, retain, incentivize and reward directors who contribute to the long-term success of TMC.

DEEPGREEN'S MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of the financial condition and results of operations of DeepGreen Metals Inc. (for purposes of this section, "DeepGreen," "we," "us" and "our") should be read together with DeepGreen's audited financial statements as of and for the years ended December 31, 2020 and 2019, and DeepGreen's unaudited interim financial statements as of March 31, 2021 and for the three months ended March 31, 2021 and 2020, in each case together with the related notes thereto, included elsewhere in this proxy statement/prospectus. The discussion and analysis should also be read together with the section titled "Selected Historical Financial Information of DeepGreen" and the pro forma financial information as of and for the three months ended March 31, 2021 and for the year ended December 31, 2020 included in this proxy statement/prospectus. See "Unaudited Pro Forma Condensed Financial Information." This discussion contains forward-looking statements and involves numerous risks and uncertainties, including, but not limited to, those described under the heading "Risk Factors." Actual results may differ materially from those contained in any forward-looking statements.

Overview

DeepGreen is a deep-sea minerals exploration company focused on the collection, processing and refining of polymetallic nodules found on the seafloor of the CCZ. DeepGreen is also developing technology for onshore processing of polymetallic nodules and is working with Allseas Group S.A. to develop a system to collect, lift and transport nodules to shore. NORI was granted an exploration license by the ISA in July 2011 and has exclusive rights to explore for polymetallic nodules covering 74,830 km^2 of the Clarion Clipperton Zone ("NORI Area"). DeepGreen entered into option agreement with Marawa in March 2012 with respect to polymetallic nodules in an exploration area of 74,990 km^2 in the Clarion Clipperton Zone granted to Marawa by the ISA in January 2015, where DeepGreen can purchase such tenements granted to Marawa or exclusively collect nodules from this area in return for a royalty payable to Marawa. During the year ended December 31, 2020, DeepGreen acquired TOML, which was granted an exploration license by the ISA in January 2012 and has exclusive rights to explore for polymetallic nodules covering 74,713 km^2 of the Clarion Clipperton Zone.

DeepGreen is an exploration stage company with no revenue to date that has incurred a net loss of $57.6 million for the three months ended March 31, 2021 and a net loss of $56.6 million for the year ended December 31, 2020 and an accumulated deficit of approximately $220.4 million from its inception through March 31, 2021.

The Business Combination

On March 4, 2021, DeepGreen entered into the Business Combination Agreement pursuant to which (i) SOAC will acquire DeepGreen on the terms and subject to the conditions set forth in the Business Combination Agreement and the Plan of Arrangement and in accordance with the provisions of applicable law. The Business Combination is expected to close in the second quarter of 2021, following the receipt of the required approval by SOAC's stockholders and the fulfillment of other conditions.

The Business Combination is anticipated to be accounted for as a reverse recapitalization. DeepGreen will be deemed the accounting predecessor and the combined entity will be the successor SEC registrant, meaning that DeepGreen's financial statements for previous periods will be disclosed in the registrant's future periodic reports filed with the SEC. Under this method of accounting, SOAC will be treated as the acquired company for financial statement reporting purposes. On a pro forma basis, this will result, assuming no shareholder redemptions, in an estimated $559.8 million ($259.8 million assuming maximum shareholder redemption) net increase in cash and cash equivalents (as compared to DeepGreen's consolidated balance sheet at March 31, 2021) and an estimated $564.3 million ($264.2 million assuming maximum shareholder redemption) net increase in total stockholders' equity (as compared to DeepGreen's consolidated balance sheet at March 31, 2021), both of which include $330.3 million in gross proceeds from the PIPE. Total transaction costs have been estimated at approximately $71.7 million. See the section entitled "*Unaudited Pro Forma Condensed Combined Financial Information*."

As a result of the Business Combination, DeepGreen will become the successor to an SEC-registered company and is expected to become a NASDAQ listed company that will be renamed "TMC the metals company Inc.," which will require DeepGreen to hire additional personnel and implement procedures and processes to address public company regulatory requirements and customary practices. DeepGreen expects to incur additional annual expenses

as a public company for, among other things, directors' and officers' liability insurance, director fees, and additional internal and external accounting, legal, and administrative resources, including increased personnel costs, audit and other professional service fees.

Exploration Contracts

NORI Exploration Contract

NORI was granted the NORI Exploration Contract on July 22, 2011. The contract was acquired for $0.25 million and provides NORI with exclusive rights to explore for polymetallic nodules in an area covering 74,830 km^2 for 15 years subject to complying with the exploration contract terms and the priority right to apply for an exploitation contract to collect polymetallic nodules in the same area.

TOML Exploration Contract

TOML was granted on January 11, 2012 the TOML Exploration Contract on January 11, 2012. The contract was acquired by DeepGreen during the year ended December 31, 2020 in connection with its acquisition of TOML for $32 million from Deep Sea Mining Finance Ltd. ("Deep Sea Mining") (as described below). TOML has exclusive rights to explore for polymetallic nodules in an area covering 74,713 km^2 for 15 years and a priority right to apply for an exploitation contract to collect polymetallic nodules in the TOML Area.

Marawa Agreements

On March 17, 2012, DGE entered into Option Agreement with Marawa and the Republic of Kiribati. This Option Agreement was amended on October 1, 2013. Under the amended Option Agreement, for an option fee of $0.25 million, DGE has the right to purchase tenements, as may be granted to Marawa by the ISA or any other regulatory body, for the greater of $0.3 million or the value of any amounts owing to DGE by Marawa. This option, can be exercised when a default event, as defined by the amendment agreement, occurs at anytime within 40 years after the date of execution of the Option agreement.

On October 1, 2013, DGE also entered into the Services Agreement with Marawa and Kiribati, which grants DGE the exclusive right to carry out all exploration and collection in the Marawa Area. Under this agreement, DGE will pay to the ISA on behalf of Marawa, ISA royalty and taxes as well as the ISA exploitation application fee of $0.25 million and annual administrative costs. In addition, DGE will ensure that the activities carried out in the Marawa Area by DGE and any other service contractor complies with the ISA and any other required regulations. The Marawa Area is situated in close proximity to the 74,830 km^2 NORI Area.

The Services Agreement grants DGE the right to recover any and all polymetallic nodules from the Marawa Area by paying the Republic of Kiribati a royalty per wet tonne of polymetallic nodules (adjusted for inflation from October 1, 2013 onwards).

DGE has the right to terminate the Services Agreement at its sole discretion by giving written notice to Marawa and Kiribati, and such termination shall take effect two months following the date of the termination notice, provided that DGE shall pay to the ISA on behalf of Marawa the fees or payments legally owed to the ISA by Marawa (including the annual ISA exploration fee and ISA royalties and taxes) that are outstanding at the date of termination or that are incurred within 12 months after the date of such termination. There are no other longer term commitments with respect to the Marawa Option and the Services Agreement.

For more information about each of the NORI Exploration Contract, the TOML Exploration Contract and the Marawa Option Agreement and Services Agreement, please see the section entitled "*Information About DeepGreen — Government Regulation*."

TOML Acquisition

On March 31, 2020, DeepGreen entered into an acquisition agreement to acquire the polymetallic nodules business unit from Deep Sea Mining (the "TOML Acquisition"). As part of this acquisition, DeepGreen acquired various subsidiaries in the TOML group for a total purchase price of $32 million. TOML holds the TOML Exploration Contract with the ISA. The TOML Acquisition includes the exclusive rights held by TOML to explore

for polymetallic nodules in an area covering 74,713 km^2, a priority right to apply for an exploitation contract to collect polymetallic nodules in the same area, and some exploration related equipment. The TOML group also holds various patents and an application right with respect to a prospecting exploration license in the Republic of Kiribati.

The purchase price of $32 million was settled through initial cash payments of $0.5 million in two tranches, the issuance of 7.8 million DeepGreen Common Shares at the mutually agreed price of $3.60 per share between both parties for a total amount of $28 million, $0.06 million payment to ISA on behalf of Deep Sea Mining and a deferred consideration of $3.44 million to be paid in tranches by June 30, 2021.

DeepGreen determined that the value of TOML acquisition was substantially concentrated in the TOML Exploration Contract and therefore considered this to be an acquisition of a group of connected assets rather than an acquisition of a business. As a consequence, the total cost of the transaction was primarily allocated to exploration licenses.

Key Trends, Opportunities and Uncertainties

DeepGreen is a pre-revenue company; DeepGreen believes that its performance and future success depends on several factors that present significant opportunities but also poses risks and challenges, including those discussed below and in the section of this proxy statement/prospectus titled "*Risk Factors*."

The recovery of polymetallic nodules from DeepGreen's exploration licenses and attainment of revenue and profitable operations is dependent upon many factors including, among other things: financing being arranged by DeepGreen to continue operations, exploration and delineation of the resources on the ocean floor; development of collection technology and systems for the extraction of polymetallic nodules as well as development of processing technology for the treatment of polymetallic nodules to produce saleable products, the establishment of a mineable resource, demonstration of the commercial and technical feasibility of seafloor polymetallic nodule collection considering processing, metal prices, and regulatory approval for nodule collection and environmental permitting. The outcome of these matters cannot presently be determined because they are contingent on future events.

To date, no exploitation has occurred under the International Seabed Area's regulatory regime. Moreover, despite the release by the ISA of the Draft Regulations on Exploitation of Mineral Resources, finalization of such regulations remains subject to the decision of the members of the ISA. Although the ISA declared a target of July 2020 to have the regulations approved, the July session was deferred as a result of the COVID-19 pandemic. Although DeepGreen expects that the new regulations will be approved within the next two years, there can be no assurance that such regulations will be approved then, or at all, which would have a material adverse effect on DeepGreen's ability to conduct its business as currently contemplated.

The exploitation and development of polymetallic nodules within the International Seabed Area will require approval of an exploitation contract (which will authorize nodule collection activities), along with approvals including with respect to a required ESIA. In order to collect the mineral resources and commercialize our projects, NORI and TOML will each need to obtain an exploitation contract, in addition to related permits that may be required by DeepGreen's partners to conduct operations including with respect to onshore processing and international maritime activities.

The ISA is currently working on the development of a legal framework to regulate the exploitation of polymetallic nodules in the International Seabed Area. Royalties, taxes, and fees payable on any future production from our contract areas will be stipulated in the ISA's exploitation regulations. While the rates of payments are yet to be set by the ISA, the 1994 Implementation Agreement prescribes that the rates of payments "shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage." The ISA has held workshops with stakeholders to discuss and seek comments on the potential financial regime for the exploitation of polymetallic nodules in the International Seabed Area and forecasts developed by DeepGreen have been informed by these discussions. There can be no assurance that the ISA will put in place exploitation regulations in a timely manner or at all. Such exploitation regulations may also impose burdensome obligations or restrictions on DeepGreen, and/or may contain terms that do not enable DeepGreen to develop its projects.

Seafloor polymetallic nodules have never been mined on a commercial scale, and there is a risk that DeepGreen's collection methods and the equipment that it intends to utilize during this process may not be adequate for the economic development of seafloor polymetallic nodule deposits. The equipment and technology that DeepGreen intends to utilize has not been fully proven in such sub-sea conditions and for this specific material and application, and failure to adapt existing equipment or to develop suitable equipment or recovery and development techniques for the prevailing material and seafloor conditions would have a material adverse effect on our business, results of operations and financial condition. DeepGreen has partnered with Allseas, a leading global offshore contractor, to undertake a pre-production pilot collector test in which a collector vehicle, a riser and lift system and other systems will be tested. Although DeepGreen expects the pilot collector test to be successful, there can be no assurance that it will be, or that their technology will eventually be adequate to collect polymetallic nodules on a commercial scale.

If NORI and TOML are each able to obtain an exploitation contract after the ISA finalizes the exploitation regulations, in addition to any related permits that may be required, and the Allseas pilot collector test is successful and DeepGreen is able to collect, transport and process polymetallic nodules on a commercial scale and sell metals from such operations, DeepGreen expects to be able to generate revenue beginning in 2024.

COVID-19

In March 2020, the World Health Organization declared the global outbreak of COVID-19 to be a pandemic. We continue to closely monitor the recent developments surrounding the continued spread and potential resurgence of COVID-19. The COVID-19 pandemic may have an adverse impact on our operations, particularly as a result of preventive and precautionary measures that DeepGreen, other businesses, and governments are taking. Refer to "*Risk Factors*" included elsewhere in this proxy statement/prospectus for more information. DeepGreen is unable to predict the full impact that the COVID-19 pandemic will have on its future results of operations, liquidity and financial condition due to numerous uncertainties, including the duration of the pandemic and the actions that may be taken by government authorities. However, COVID-19 is not expected to result in any significant changes in costs going forward. DeepGreen will continue to monitor the performance of its business and reassess the impacts of COVID-19.

Basis of Presentation

DeepGreen currently conducts its business through one operating segment. As a pre-revenue company with no commercial operations, DeepGreen's activities to date have been limited and its historical results are reported under U.S. GAAP and in U.S. dollars.

Components of Results of Operations

DeepGreen is an exploration-stage company and its historical results may not be indicative of its future results for reasons that may be difficult to anticipate. Accordingly, the drivers of DeepGreen's future financial results, as well as the components of such results, may not be comparable to DeepGreen's historical or projected results of operations.

Revenue

To date, DeepGreen has not generated any revenue. DeepGreen does not expect to generate revenue until at least 2024 and only if NORI and/or TOML receive an exploitation contract from the ISA and DeepGreen is able to successfully collect polymetallic nodules and process the nodules into saleable products on a commercial scale. Any revenue from initial production is difficult to predict.

Exploration Expenses

DeepGreen expenses all costs relating to exploration for and development of mineral resources. Such exploration and development costs include, but are not limited to, ISA contract management, geological, geochemical and geophysical studies, environmental baseline studies and process development. The acquisition cost of mineral contracts would be charged to operations on a unit-of-production method based on proven and probable reserves should commercial production commence in the future.

Selling, General and Administrative Expenses

Selling, general and administrative, or SG&A, expenses consist primarily of compensation for employees, consultants and directors, including stock-based compensation, consulting fees, investor relations expenses; expenses related to advertising and marketing functions, insurance costs, office and sundry expenses, professional fees (including legal, audit and tax fees), travel expenses and transfer and filing fees.

Stock-based compensation cost from the issuance of stock options is measured at the grant date based on the fair value of the award and is recognized over the related service period. Stock-based compensation costs are charged to exploration expenses and general and administrative expense depending on the function fulfilled by the option holder. In instances stock options are issued for financing related services, the costs are included within equity as part of the financing costs. DeepGreen recognizes forfeiture of any awards as they occur.

DeepGreen expects SG&A expenses to continue to increase in absolute dollars as it expands its infrastructure to commence production and due to additional legal, accounting, insurance and other expenses associated with being a public company.

Interest Income/Expense

Interest income consists primarily of interest income earned on our cash and cash equivalents. DeepGreen expects interest income to increase considerably into the future given the increase of cash on its balance sheet as a result of the Business Combination.

Interest expense results from DeepGreen's financing transactions, specifically the convertible debentures issued in February 2021, which accrue interest at 7% per annum.

Foreign Exchange Loss

The foreign exchange income or loss for the periods primarily relates to DeepGreen's cash held in Canadian dollars and also to the settlement of costs incurred in foreign currencies, depending on either the strengthening or weakening of the US dollar.

Results of Operations

Comparison of the Three Months Ended March 31, 2021 and 2020

	Three Months Ended March 31			
	2021	**2020**	**Change**	**% Change**
	(dollar amounts in thousands)			
Exploration expenses	39,364	12,182	27,182	223%
SG&A	17,955	875	17,080	1,952%
Interest (income) expense	220	(41)	261	(637)%
Foreign exchange (gain) loss	19	(35)	54	(154)%
	57,558	12,981	44,577	343%

Exploration Expenses

Exploration expenses increased by approximately $27.2 million, or 223%, to $39.4 million during the three months ended March 31, 2021, compared to $12.1 million during the three months ended March 31, 2020. This increase was primarily due to the recognition of $19.4 million (compared to $0.1 million during the same period in 2020) of stock-based compensation from the issuance of stock options granted to personnel during the three months ended March 31, 2021. The stock-based compensation cost for the stock options granted to individuals involved in the exploration activities is included within exploration expenses for the periods. In addition, the cost of marine cruises that DeepGreen undertook during the three months ended March 31, 2021 was $16.6 million (compared to $10.2 million during the same period in 2020). DeepGreen has a strategic partnership with Maersk, as described below, pursuant to which it settled the cost for marine vessel services provided by Maersk through the issuance of DeepGreen Common Shares. Such DeepGreen Common Shares were recognized at their fair value and the changes in such fair value have a significant impact on its exploration expenditures. During March 2021, DeepGreen

revised its arrangement with Maersk, which now requires settlement of marine vessel services in cash instead of DeepGreen Common Shares and going forward, such costs are expected to reflect the cost of the marine cruises undertaken with no additional impact on the cost resulting from the change in the fair value of DeepGreen Common Shares. DeepGreen expects exploration expenses to increase during the remainder of 2021 due to an increase in planned exploration campaigns to undertake environmental baseline surveys to support the ESIA and permitting requirements as well as milestones being reached for the pilot collector test program with Allseas. Processing expenditure is also expected to increase with completion of pyrometallurgical and hydrometallurgical pilot testing.

Selling, General and Administrative Expenses

SG&A expenses increased $17.1 million, or 1,952%, to $18.0 million during the three months ended March 31, 2021, compared to $0.9 million during the three months ended March 31, 2020. The increase in SG&A expenses was as a result of the stock-based compensation recognized of $12.9 million and costs incurred in connection with the Business Combination. Total additional professional fees incurred during the three months ended March 31, 2021 amounted to $2.8 million. Our activities overall also increased and we incurred additional consulting fees of $0.64 million and marketing costs of $1.1 million, respectively. DeepGreen expects SG&A expenses to increase significantly during 2021 due to additional professional fees (including legal, audit and tax fees) and other costs of becoming and being a public company.

Interest Expense

During the three months ended March 31, 2021, we recognized interest expense of $0.2 million as a result of the issuance of 7% convertible debentures of $26 million during February 2021.

Comparison of the Years Ended December 31, 2020 and 2019

	Years Ended December 31,			
	2020	**2019**	**Change**	**% Change**
	(dollar amounts in thousands)			
Exploration expenses	48,881	38,830	10,051	26%
SG&A	7,723	4,468	3,255	73%
Interest income	(53)	(300)	247	(82)%
Foreign exchange loss	80	74	6	9%
	56,631	**43,072**	**13,559**	**31%**

Exploration Expenses

Exploration expenses increased by approximately $10 million, or 26%, to $48.9 million during the year ended December 31, 2020, compared to $38.8 million during the year ended December 31, 2019. This increase was primarily due to $11.7 million incurred in relation to the pilot mining test project with Allseas, half of which was paid for with the issuance of DeepGreen Common Shares. In addition to Allseas, DeepGreen also has a strategic partnership with Maersk, as described below, where we settled the cost for marine vessel services provided by Maersk through the issuance of DeepGreen Common Shares. Such DeepGreen Common Shares are recognized at fair value of the DeepGreen Common Shares based on the evidence of recent private placements and have a significant impact on our exploration expenditures. These costs, settled through DeepGreen Common Shares, were $21.2 million and $25.3 million during the years ended December 31, 2020 and 2019, respectively. As noted above, during March 2021, DeepGreen revised its arrangement with Maersk to now require settlement of marine vessel services in cash instead of DeepGreen Common Shares.

Selling, General and Administrative Expenses

SG&A expenses increased $3.3 million, or 73%, to $7.7 million during the year ended December 31, 2020, compared to $4.5 million during the year ended December 31, 2019. The increase in SG&A expenses was primarily due to an increase of $2.9 million in share-based payments due to the incentive stock options granted during 2020, the increase in personnel-related expenses of $0.7 million as a result of higher headcount and salaries, and an increase of $0.4 million in professional fees as a result of DeepGreen’s efforts to become a public company. These expenses were offset by a decrease in the overall marketing expenses incurred by DeepGreen of $0.4 million and

reduced travel costs of $0.2 million due to COVID-19 travel restrictions. During the year ended December 31, 2019, DeepGreen incurred additional success fees to certain directors upon reaching a previously agreed financing milestone and as a result, DeepGreen's director fees in 2020 were lower by $0.3 million. DeepGreen expects SG&A expenses to increase significantly during 2021 due to additional professional fees (including legal, audit and tax fees) and other costs of becoming and being a public company.

Interest Income

Interest income decreased by $0.25 million during the year ended December 31, 2020, compared to the year ended December 31, 2019, due to a comparatively higher interest rate environment during 2019.

Liquidity and Capital Resources

To date, DeepGreen's primary sources of capital have been private placements of DeepGreen Common Shares and DeepGreen Preferred Shares and a recent issuance of convertible debentures completed in February 2021, which are automatically convertible into DeepGreen Common Shares immediately prior to the completion of the Business Combination. As of March 31, 2021, DeepGreen had cash and cash equivalents of $25.2 million and an accumulated deficit of $220.4 million.

As of the date of this proxy statement/prospectus, DeepGreen has yet to generate any revenue from its business operations. DeepGreen is an exploration stage company and the recovery of its investment in mineral exploration contracts and attainment of profitable operations is dependent upon many factors including, among other things, exploring and developing the ocean floor for the collection of polymetallic nodules as well as the development of its processing technology for the treatment of such nodules, the establishment of mineable reserves, the demonstration of commercial and technical feasibility of seafloor polymetallic nodule collection and processing, metal prices, and regulatory approval for exploitation and environmental permitting. While DeepGreen has obtained financing in the past, there is no assurance that such financing will continue to be available.

Fiscal 2019 Financings

During the year ended December 31, 2019, DeepGreen issued 10.1 million DeepGreen Common Shares in private placements for total proceeds of $26.2 million. Of this amount, $20 million was received from Allseas in connection with DeepGreen's strategic alliance with Allseas.

DeepGreen further issued 8.2 million DeepGreen Common Shares for marine vessel services pursuant to an agreement with Maersk to settle Maersk's invoiced cost of $10.2 million at an agreed upon contract price of $1.25 per share. Such shares were recognized in our accounting records at $3.60 per share based on the pricing of the other private placements. Additional 0.5 million of DeepGreen Common Shares were issued upon exercise of incentive stock options at a price of $0.70 per share for total proceeds of $0.35 million.

Fiscal 2020 Financings

During the year ended December 31, 2020, DeepGreen issued 5.7 million DeepGreen Common Shares in private placements for total proceeds of $20.4 million. Inclusive in this was subscription from Allseas for 2.8 million DeepGreen Common Shares for total proceeds of $10 million.

DeepGreen further issued 2.8 million DeepGreen Common Shares for services to Allseas at a price of $3.60 per share for total value of $10.1 million and 4.1 million DeepGreen Common Shares for marine vessel services to Maersk to settle invoiced cost of $5.1 million at an agreed upon contract price of $1.25 per share. Such shares issued to Maersk were recognized for accounting purposes at $3.60 per share.

During the year ended December 31, 2020, option holders exercised 2.3 million stock options for total proceeds of $0.9 million at an average exercise price of $0.41 per share.

Fiscal 2021 Financings

During the three months ended March 31, 2021, DeepGreen issued 3.7 million DeepGreen Common Shares to Maersk for marine vessel services. Such Common Shares were valued at $7 per DeepGreen Common Share. Certain holders of stock options exercised their rights in exchange for 1.9 million DeepGreen Common Shares. The weighted average exercise price of these stock options was $0.74 per DeepGreen Common Share resulting in total proceeds of $1.4 million for DeepGreen.

During February 2021, DeepGreen raised a total of $26 million through convertible debentures financing. The convertible debentures bear interest at the rate of 7.0% per annum, compounded annually, with a maturity date that is 24 months from the date of the financing. The debentures can be converted into DeepGreen Common Shares at any time at the conversion price of $10 per share. Unless any interest is converted prior to the maturity date, all accrued and unpaid interest shall be payable at the maturity date in DeepGreen Common Shares at a conversion price of $10 per share.

Upon completion of the Business Combination or another change of control transaction by DeepGreen at any time prior to the maturity date, the debenture value will be automatically converted into DeepGreen Common Shares at the conversion price immediately prior to the Business Combination or the change of control transaction. If the debentures, or any portion thereof, are not converted by the holder upon the earlier of the maturity date or the completion of the Business Combination or the change of control transaction, the outstanding debenture value will automatically convert into DeepGreen Common Shares at the conversion price of $10 per DeepGreen Common Share.

On February 18, 2021, debentures totaling $500,000 were converted into 50,000 DeepGreen Common Shares.

On a pro forma basis, assuming shareholder approval and the closing of the Business Combination and the PIPE, DeepGreen's cash and cash equivalents would have amounted to approximately $585.1 million on March 31, 2021, assuming no or de minimis redemptions by SOAC public shareholders (or $285 million in case of maximum redemption).

DeepGreen expects its capital expenditures and working capital requirements to increase materially in the near future as NORI and TOML seek to obtain exploitation contracts, perform the required environmental studies, complete pre-feasibility and feasibility studies and commence full-scale commercial production and processing of the polymetallic nodules collected from the deep seabed. DeepGreen believes that its cash on hand is currently sufficient to meet its working capital and capital expenditure requirements for a period of at least twelve months from the date of this proxy statement/prospectus. In addition, DeepGreen believes that its cash on hand following the closing of the Business Combination, including the net proceeds from SOAC's cash in trust (assuming no or de minimis redemptions by SOAC's stockholders) and the PIPE, will be sufficient to meet its working capital and capital expenditure requirements for a period of at least twelve months from the date of this proxy statement/prospectus and sufficient to fund its operations until it commences small scale commercial production (Project Zero) expected to commence in 2024, assuming DeepGreen is able to do so as currently contemplated. DeepGreen may, however, need additional cash resources due to changed business conditions or other developments, including, but not limited to, significant redemptions by SOAC public shareholders, deferral of approvals, capital cost escalation, currently unrecognized technical and development challenges or change in external business environment. To the extent that DeepGreen's current resources are insufficient to satisfy its cash requirements, DeepGreen may need to seek additional equity or debt financing. If the financing is not available, or if the terms of financing are less desirable than DeepGreen expects, DeepGreen may be forced to delay its exploration and/or exploitation activities or scale back its operations, which could have a material adverse impact on its business and financial prospects.

Cash Flows Summary

Comparison of the Three Months Ended March 31, 2021 and March 31, 2020

The following table summarizes our sources and uses of cash for the three months ended March 31, 2021 and March 31, 2020:

Presented below is a summary of DeepGreen's operating, investing and financing cash flows:

	Three Months Ended March 31,	
	2021 (in thousands)	2020 (in thousands)
Net cash (used in) operating activities	$ (10,060)	$ (2,929)
Net cash (used in) investing activities	$ (2,190)	$ (250)
Net cash provided by financing activities	$ 27,377	$ 1,167
	$ (15,127)	$ (2,012)

Cash flows used in Operating Activities

Net cash used in operating activities for the three months ended March 31, 2021 was $10.1 million, attributable to a net loss of $57.6 million and a net change in net operating assets and liabilities of $2.3 million and non-cash adjustments of $45.2 million. Non-cash adjustments primarily consisted of $12.8 million for the value of shares issued to Maersk and $32.3 million of share-based payments related to the value of the incentive stock options recognized during the three months ended March 31, 2021, and $0.1 million for amortization of equipment. The change in DeepGreen's net operating assets and liabilities was primarily due to a $2.1 million increase in accounts payable and accrued liabilities due to the timing of payments.

Net cash used in operating activities for the three months ended March 31, 2020 was $2.9 million, attributable to a net loss of $13 million and a net change in net operating assets and liabilities of $1.5 million and non-cash adjustments of $8.6 million. Non-cash adjustments primarily consisted of $8.3 million for the value of shares issued to Allseas and Maersk as described above, $0.1 million of share-based payments related to the value of the incentive stock options recognized during the three months ended March 31, 2020, and $0.14 million for amortization of equipment. The change in DeepGreen's net operating assets and liabilities was primarily due to a $1.5 million increase in accounts payable and accrued liabilities due to the timing of payments.

Cash flows used in Investing Activities

Net cash used in investing activities for the three months ended March 31, 2021 was $2.2 million and related to the payments made to Deep Sea Mining for a portion of the deferred consideration that became due during the period. As at March 31, 2021, DeepGreen's commitment in connection with the deferred consideration for TOML Acquisition amounted to $1.3 million.

Net cash used in investing activities for the three months ended March 31, 2020 was $0.3 million and related to the first payment made to Deep Sea Mining in connection with the TOML Acquisition.

Cash flows provided by Financing Activities

Net cash provided by financing activities for the three months ended March 31, 2021 was $27.4 million related to proceeds of $26 million from the issuance of convertible debentures and $1.4 million from exercise of incentive stock options.

Net cash provided by financing activities for the three months ended March 31, 2020 was $1.2 million related to proceeds from private placements.

Comparison of the Years Ended December 31, 2020 and December 31, 2019

The following table summarizes DeepGreen's sources and uses of cash for the years ended December 31, 2020 and December 31, 2019:

Presented below is a summary of DeepGreen's operating, investing and financing cash flows:

	Years Ended December 31,	
	2020 (in thousands)	2019 (in thousands)
Net cash (used in) operating activities	$ (26,532)	$ (15,078)
Net cash (used in) investing activities	$ (607)	$ (2,123)
Net cash provided by financing activities	$ 21,293	$ 26,506
	$ (5,846)	$ 9,305

Cash flows used in Operating Activities

Net cash used in operating activities for the year ended December 31, 2020 was $26.5 million, attributable to a net loss of $56.6 million and a net change in our net operating assets and liabilities of $2.4 million and non-cash adjustments of $27.7 million. Non-cash adjustments primarily consisted of $23.0 million for the value of shares issued to Allseas and Maersk as described above, $4.1 million of share-based payments related to the value of the incentive stock options recognized during the year, and $0.56 million for amortization of equipment. The change in DeepGreen's net operating assets and liabilities was primarily due to a $2.5 million increase in accounts payable and accrued liabilities due to the timing of payments.

Net cash used in operating activities for the year ended December 31, 2019 was $15.1 million, attributable to a net loss of $43.1 million and a net change in our net operating assets and liabilities of $0.6 million and non-cash adjustments of $27.4 million. Non-cash adjustments primarily consisted of $25.3 million for the value of shares issued to Allseas and Maersk as described above, $1.7 million of share-based payments related to the value of the incentive stock options recognized during the year, and $0.34 million for amortization of equipment. The change in DeepGreen's net operating assets and liabilities was primarily due to a $0.6 million increase in accounts payable and accrued liabilities due to the timing of payments and receipt of interest income during the year of $0.3 million. This was offset by making an additional $0.2 million of pre-payments towards expenses to be incurred during the year ended December 31, 2020.

Cash flows used in Investing Activities

Net cash used in investing activities for the year ended December 31, 2020 was $0.6 million and related to the payments made for the TOML Acquisition described above. DeepGreen made a total $0.5 million payment to Deep Sea Mining and incurred additional $0.1 million in related transaction costs.

Net cash used in investing activities for the year ended December 31, 2019 was $2.1 million and related to the purchases of exploration equipment.

Cash flows provided by Financing Activities

Net cash provided by financing activities for the year ended December 31, 2020 was $21.3 million related to proceeds of $20.4 million from private placements and $0.9 million for exercise of incentive stock options.

Net cash provided by financing activities for the year ended December 31, 2019 was $26.5 million related to proceeds of $26.2 million from private placements and $0.3 million for exercise of incentive stock options.

Contractual Obligations and Commitments

NORI Exploration Contract

As part of the NORI Exploration Contract with the ISA with respect to the NORI Area, NORI committed to expending $5 million over the five-year period from 2017 to 2021. Such commitment has already been met. Such commitment is negotiated with the ISA and has flexibility where the amount can be reduced.

Marawa Option Agreement and Services Agreement

As part of DGE's Option Agreement and Services Agreement with Marawa respect to the Marawa Area, Marawa commits to expending funds on exploration activities on an annual basis. The commitment for fiscal 2020 was Australian dollar $1 million and for 2021 is Australian dollar $2 million. Such commitment is negotiated by the contract holder with the ISA for five year plans and is subject to regular periodic reviews.

TOML Exploration Contract

As part of the TOML Exploration Contract with the ISA with respect to the TOML Area, TOML has committed to expending $30 million for a five-year period from 2016 to 2021 in the first-year review finalized in 2016. Such commitment has flexibility where the amount can be reduced by the ISA and such reduction would be dependent upon various factors including the success of the exploration programs and the availability of funding. As at March 31, 2021, DeepGreen had expended approximately $11.2 million in connection with the TOML Exploration Contract. DeepGreen is due to discuss the progress since the acquisition of the TOML Group with the ISA later during 2021.

Regulatory Obligations Relating to Exploration Contracts

Each of TOML and NORI require sponsorship from their respective host sponsoring nations, the Kingdom of Tonga and the Republic of Nauru, respectively. Each company has been registered and incorporated within the applicable host nation's jurisdiction. The ISA requires that a contractor must obtain and maintain sponsorship by a host nation that is a member of the ISA and such nation must maintain effective supervision and regulation over such sponsored contractor. Even though DeepGreen holds beneficial ownership of each subsidiary, they are subject to the registration and incorporation requirements of these nations. In the event the sponsorship is otherwise terminated, such subsidiary will be required to obtain new sponsorship from another host nation that is a member of the ISA. Failure to obtain such new sponsorship would have a material impact on the operations of such subsidiary and DeepGreen.

Allseas Agreements

On March 29, 2019, DeepGreen and Allseas entered into a strategic alliance to develop and deploy a PMTS, successful completion of which would aid DeepGreen's application for an exploitation contract with ISA. Allseas agreed to cover all the development cost of the project and in consideration for a successful Pilot Mining Test, DeepGreen had committed to expending $30 million in cash and further issuing 10 million DeepGreen Common Shares (at a contractual price of $3.00 per share at time of the agreement) for a total value of $60 million to Allseas.

During 2020, the PMTS agreement was amended and DeepGreen paid $10 million in cash and issued 2.8 million common shares valued at $3.60 per share for an additional $10 million to allow for higher cost that had been incurred by Allseas and to facilitate the acquisition of the Hidden Gem vessel by Allseas, which has strategic importance to DeepGreen, by providing a platform to develop a smaller-scale, lower-capital early production system. As at December 31, 2020, DeepGreen's original commitment of $30 million in cash and 10 million DeepGreen Common Shares still remained to be completed as such obligation is dependent upon successful completion by Allseas of the collector test.

On March 4, 2021, DeepGreen entered into an amended agreement with Allseas (the "Amendment # 3") whereby, upon successful completion of the Business Combination, instead of issuing 10 million Common Shares to Allseas in connection with the PMTS, DeepGreen issued to Allseas a warrant to acquire 10 million DeepGreen Common Shares at a nominal value (the "Allseas Warrant"). The Allseas Warrant will vest and become exercisable upon successful completion of the PMTS and will expire on September 30, 2026. There are vesting conditions associated with the Allseas Warrant whereby a maximum of 10 million DeepGreen Common Shares would be issued if the PMTS is completed by September 30, 2023, gradually decreasing to 5 million DeepGreen Common Shares if PMTS is completed after September 30, 2025.

The Allseas Warrant will be assumed by SOAC at the closing of the Business Combination to become a warrant to purchase TMC Common Shares, adjusted for the exchange ratio for the transaction. If the market price of TMC Common Shares on June 1, 2022 is higher than $15 per share (as adjusted based on the exchange ratio for the closing

of the Business Combination), the aggregate value of the shares underlying the warrant above $150 million as at June 1, 2022 will automatically become a commercial credit from Allseas to TMC equal to the excess value. This commercial credit will be effective on the vesting date of the Allseas Warrant and the Company will be able to exchange this excess value for any future goods and services from Allseas under the nodule collection and shipping contract for one year after commercial production.

The cash payment of $30 million in the original agreements was also amended to be paid as follows provided that the Business Combination is completed:

- $10 million on June 30, 2021 with Allseas providing confirmation of placing an order of certain equipment and demonstrating certain progress on construction of the collector vehicle;
- $10 million on the later of (i) January 1, 2022, and (ii) confirmation of successful collection of the North Sea test; and
- $10 million upon successful completion of the PMTS.

DeepGreen currently expects that it will make such $10,000,000 payment to Allseas on the later of June 30, 2021 or upon the completion of the Business Combination if the Business Combination is not completed by June 30, 2021.

The Amendment #3 is not effective until the successful completion of the Business Combination. If the Business Combination is not consummated, the Allseas Warrant shall be cancelled and the rights and obligations set forth in Amendment # 3 shall not take effect and the rights and obligations under the arrangements with Allseas as in effect prior to the execution of Amendment #3 shall continue in effect unless otherwise amended.

Maersk Agreements

Effective March 15, 2017, DeepGreen entered into a strategic partnership with Maersk to undertake the exploration, environmental base line and offshore testing required to support development of feasibility studies for economic production of polymetallic nodules from the CCZ. Under the agreement, Maersk provides marine vessel services and project management services, enabling DeepGreen to undertake the various marine cruises to support required prefeasibility studies. During these marine cruises, DeepGreen undertook baseline studies required to complete an ESIA, collected nodules for metallurgical test work and collected samples for resource evaluation. The invoiced cost related to the marine vessel was settled through DeepGreen Common Shares at an agreed upon price of $1.25 per DeepGreen Common Share. Services provided by Maersk for managing these marine cruises are paid in cash.

On March 4, 2021, the agreement with Maersk was amended whereby all future costs pertaining to the use of the marine vessels would be paid in cash rather than through issuance of DeepGreen Common Shares. The amended agreement is in place until early 2022, at which point the parties will negotiate any potential future offshore engagements.

Offtake Agreement

On May 25, 2012, DGE and Glencore entered into a copper offtake agreement and a nickel offtake agreement. DGE has agreed to deliver to Glencore 50% of the annual quantity of copper and nickel produced by a DGE owned facility from nodules derived from the NORI Area at LME referenced market pricing with allowances for product quality and delivery location. Either party may terminate the agreement upon a material breach or insolvency of the other party. Glencore may also terminate the agreement by giving twelve months' notice.

Sponsorship Agreements

On July 5, 2017, Nauru, the Nauru Seabed Minerals Authority and NORI entered into the NORI Sponsorship Agreement formalizing certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI Area. Upon reaching the minimum recovery level within the tenement area, NORI will pay Nauru a seabed mineral recovery payment based on the polymetallic nodules recovered from the tenement area. In addition, NORI will pay an administration fee each year to Nauru for such administration and sponsorship, which is subject to review and increase in the event that NORI is granted an ISA exploitation contract.

On March 8, 2008, Tonga and TOML entered into the TOML Sponsorship Agreement formalizing certain obligations of the parties in relation to TOML's exploration and potential exploitation of the TOML Area. Upon reaching the minimum recovery level within the tenement area, TOML has agreed to pay Tonga a seabed mineral recovery payment based on the polymetallic nodules recovered from the tenement area. In addition, TOML has agreed to pay the reasonable direct costs incurred by Tonga to administer the ISA obligations of Tonga to the ISA.

Off-Balance Sheet Arrangements

DeepGreen is not a party to any off-balance sheet arrangements, as defined under SEC rules.

Critical Accounting Policies and Estimates

DeepGreen's financial statements have been prepared in accordance with U.S. GAAP. In the preparation of these financial statements, DeepGreen is required to use judgment in making estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities as of the date of the financial statements, as well as the reported expenses incurred during the reporting periods.

DeepGreen considers an accounting judgment, estimate or assumption to be critical when (1) the estimate or assumption is complex in nature or requires a high degree of judgment and (2) the use of different judgments, estimates and assumptions could have a material impact on the consolidated financial statements. DeepGreen's significant accounting policies are described in Note 2 to its audited consolidated financial statements included elsewhere in this proxy statement/prospectus. DeepGreen has the critical accounting policies and estimates which are described below.

TOML Acquisition

On March 31, 2020, DeepGreen completed the TOML Acquisition and applied guidance from ASC 805 to understand the accounting treatment regarding this acquisition and make necessary judgements.

ASC 805 defines a business as inputs and processes, when applied to the inputs, resulting in the creation of outputs. The key input acquired in connection with the TOML Acquisition is the TOML Exploration Contract and the related intellectual property. TOML Exploration Contract is in the development stage and therefore does not produce outputs. ASC 805 requires that where there is no output, there must be both an input and substantive process which must include an organized workforce with the necessary skills, experience, and knowledge to develop and convert the inputs into outputs, for a group of assets to be considered a business. An organized workforce was not included in the TOML Acquisition and therefore DeepGreen's management deemed that the TOML Acquisition was not a business acquisition and only an acquisition of a group of assets.

DeepGreen's position is supported by ASC 805's guidance that if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not considered a business. The value of the TOML is considered to be primarily in the TOML Exploration Contract.

DeepGreen's management also determined that other assets acquired (which included other intangible assets, such as patents and trademarks) were connected to the TOML Exploration Contract and would not hold value by themselves. The value of the total cost was therefore capitalized into one line item on DeepGreen's balance sheet, within Exploration licenses.

Value of Common Share-Based Payments

DeepGreen recognizes the cost of share-based awards granted to employees and directors based on the estimated grant-date fair value of the awards. DeepGreen determines the fair value of stock options using the Black-Scholes option pricing model, which is impacted by the following assumptions:

- Fair Value of Common Shares on the Date of the Grant — DeepGreen used the price of the most recent private placements to assess the value of its shares on the date of the grant of incentive stock options.
- Expected Term — DeepGreen used the term of the award when calculating the expected term due to insufficient historical exercise data.

- Expected Volatility — As DeepGreen's Common Shares are not actively traded, the volatility is based on a benchmark of comparable companies within the mining industry.
- Expected Dividend Yield — The dividend rate used is zero as DeepGreen has never paid any cash dividends on its Common Shares and does not anticipate doing so in the foreseeable future.
- Risk-Free Interest Rate — The interest rates used are based on the implied yield available on Canadian Treasury zero-coupon issues with an equivalent remaining term equal to the expected life of the award.

Emerging Growth Company Status

Section 102(b)(1) of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies are required to comply with the new or revised financial accounting standards. The JOBS Act provides that a company can choose not to take advantage of the extended transition period and comply with the requirements that apply to non-emerging growth companies, and any such election to not take advantage of the extended transition period is irrevocable.

SOAC is an "emerging growth company" as defined in Section 2(a) of the Securities Act and has elected to take advantage of the benefits of the extended transition period for new or revised financial accounting standards. Following the closing of the Business Combination, DeepGreen expects to remain an emerging growth company at least through the end of the 2021 fiscal year and DeepGreen expects to continue to take advantage of the benefits of the extended transition period, although it may decide to early adopt such new or revised accounting standards to the extent permitted by such standards. This may make it difficult or impossible to compare DeepGreen's financial results with the financial results of another public company that is either not an emerging growth company or is an emerging growth company that has chosen not to take advantage of the extended transition period exemptions because of the potential differences in accounting standards used.

Recent Accounting Pronouncements

See Note 2 to the audited consolidated financial statements included elsewhere in this proxy statement/prospectus for more information about recent accounting pronouncements, the timing of their adoption, and DeepGreen's assessment, to the extent it has made one, of their potential impact on DeepGreen's financial condition and its results of operations and cash flows.

Quantitative and Qualitative Disclosures About Market Risk

DeepGreen is exposed to a variety of markets and other risks including the effects of change in interest rates, inflation and foreign currency translation and transaction risks as well as risks to the availability of funding sources, hazard events and specific asset risks. DeepGreen also expects to be exposed to commodity risks if and when it commences commercial production.

Interest Rate Risk and Credit Risk

Interest rate risk is the risk that the fair value or future cash flows of DeepGreen and DeepGreen's financial instruments will fluctuate because of changes in market interest rates.

DeepGreen's current practice is to invest excess cash in investment-grade short-term deposit certificates issued by reputable Canadian financial institutions with which it keeps its bank accounts and management believes the risk of loss to be remote. DeepGreen periodically monitors the investments it makes and is satisfied with the credit ratings of its banks. Due to the current low interest rate environment, DeepGreen had not invested any cash in investments earning interest as at March 31, 2021.

Credit risk is a risk of loss that may arise on outstanding financial instruments should a counter party default on its obligation. DeepGreen's receivables consist primarily of general sales tax due from the Federal Government of Canada and as a result, the risk of default is considered to be low. Once DeepGreen commences commercial production, it expects its credit risk to rise with its increased customer base.

Material Weakness

In the course of preparing the financial statements that are included in this proxy statement/prospectus, DeepGreen has identified a material weakness in its internal control over financial reporting as of December 31, 2020, which relates to a deficiency in the design and operation of the financial statement close and reporting controls, including maintaining sufficient written policies and procedures and the need to use appropriate technical expertise when accounting for complex or non-routine transactions. DeepGreen's management has concluded that this material weaknesses is due to the fact that, prior to this proxy statement/prospectus, DeepGreen was a private company with limited resources. DeepGreen recently appointed a chief financial officer and is currently recruiting additional finance personnel and has engaged a reputable independent accounting group to undertake a review and gap analysis of current systems and processes in order to develop a remediation plan.

Foreign Currency Risk

Foreign currency risk is the risk that the fair value or future cash flows of an exposure will fluctuate because of changes in foreign exchange rates. DeepGreen's exposure to the risk of changes in foreign exchange rates relates its transactions in foreign currencies, primarily in the Canadian dollar, the Australian dollar, and the Great British Pounds. DeepGreen primarily holds its cash in US dollars and settles its foreign currency payables soon after the receipt of invoices thereby minimizing the foreign currency exposure.

Once DeepGreen commences commercial production, it expects to be exposed to both currency transaction and translation risk. To date, DeepGreen has not had material exposure to foreign currency fluctuations and has not hedged such exposure, although it may do so in the future.

Commodity Price Risk

DeepGreen expects to engage in the collection, transport, processing and sale of products containing nickel, copper, manganese and cobalt from the polymetallic nodules collected from its contract areas of the CCZ. Accordingly, DeepGreen expects the principal source of future revenue to be the sale of products containing nickel, copper, manganese and cobalt. A significant and sustained decrease in the price of these metals from current levels could have a material and negative impact on DeepGreen's business, financial condition and results of operations.

MANAGEMENT OF TMC FOLLOWING THE BUSINESS COMBINATION

Board of Directors and Management

The following is a list of the persons who are anticipated to be TMC's directors and executive officers following the Business Combination and their ages as of May 1, 2021 and anticipated positions following the Business Combination.

Directors and Executive Officers

Name	Age	Position
Gerard Barron	54	Chief Executive Officer and Chairman of the Board of Directors
Anthony O'Sullivan	54	Chief Development Officer
Erika Ilves	43	Head of Strategy and Business Development
Craig Shesky	37	Chief Financial Officer
Dr. Gregory Stone	64	Chief Ocean Scientist
Jeffrey Donald	52	Head of Onshore Development
Corey McLachlan	43	Head of Stakeholder Engagement
Scott Leonard[(1)]	46	Director
Christian Madsbjerg	46	Director
Andrew Hall	57	Director
Eric Branderiz	56	Director
Sheila Khama	64	Director
Andrei Karkar	43	Director
Riva Krut	63	Director (effective September 1, 2021)

(1) Nominated by Sponsor.

Gerard Barron has agreed to serve as TMC's Chief Executive Officer and Chairman of the Board of Directors upon the closing of the Business Combination and has been nominated to serve as a member of the TMC board of directors upon the closing of the Business Combination. Mr. Barron became involved in the early strategic development and financing of DeepGreen during its formation in 2011 and stepped into the role of DeepGreen's Chairman and Chief Executive Officer in 2018. From July 2013 until becoming Chairman and Chief Executive Officer in 2017, Mr. Barron served as a strategic advisor to DeepGreen Board and shareholders. Mr. Barron is a seasoned entrepreneur with a track record of building global companies in battery technology, media and future-oriented resource development both as a chief executive officer and strategic investor. In 2001, Mr. Barron founded Adstream, a global advertising technology and services provider, and served as the company's Chief Executive Officer until December 2013. During that time, Adstream grew from a single office in Sydney to over 40 offices in 30 countries around the world and over $100 million in global revenue per year. Mr. Barron has also been a first money investor in industry-leading companies including Nautilus Minerals and Sirtex Medical. Mr. Barron's qualifications to serve on the board of directors of TMC include his extensive leadership and investment experience in the technology and resource development industries.

Anthony O'Sullivan has agreed to serve as TMC's Chief Development Officer upon the closing of the Business Combination and has served as DeepGreen's Chief Development Officer since July 25, 2017. Mr. O'Sullivan has over 30 years mining experience with a track record of delivering innovative solutions across multiple continents both in the terrestrial and marine environments. Since January 2020, Mr. O'Sullivan has served as a non-executive director for SensOre Ltd., a company that performs mineral targeting. From February 2017 to December 2019, Mr. O'Sullivan served as the Chief Executive Officer of Sasak Minerals Pty Ltd., a company focused on deploying machine learning and mineral exploration. From February 2017 to July 2017, Mr. O'Sullivan served as the Principal and Owner of International Resources, a firm focused on creating value through the discovery and development of mineral resources. From November 2014 until January 2017, he served as Vice President Exploration for Quantum Pacific Exploration, where he engaged in planning, development, and management of the exploration company, including developing corporate strategies, overseeing exploration activities, evaluating existing and potential new assets, establishing an exploration team and identifying a suite of new opportunities. In December 2005, Mr. O'Sullivan began serving as Chief Operating Officer of Nautilus Minerals, a position he held until December 2012. While serving as Chief Operating Officer of Nautilus, Mr. O'Sullivan led exploration, engineering and design, project development, permitting and product marketing

culminating in the declaration of 43-101 compliant resources, grant of the environmental permit and mining lease from the Government of Papua Niugini, ore sales agreement with one of China's leading copper producers, Tongling Nonferrous Metals Group, and the completion of project design and commencement of project construction. Mr. O'Sullivan was previously part of the BHP Billion Global Exploration Leader Team with responsibility for the company's iron ore, bauxite, coal and non-porphyry base metal exploration portfolios. Mr. O'Sullivan is the named co-inventor on 5 subsea mining patents. Mr. O'Sullivan earned a M.Sc. in Mineral Exploration from the University of Western Australia and a B.Sc. (Hons) in Geology from the University of Western Australia.

Erika Ilves has agreed to serve as TMC's Head of Strategy and Business Development upon the closing of the Business Combination and has served as DeepGreen's Head of Strategy and Business Development since September 2018. During her time at DeepGreen, Erika has worked to build the world's first vertically integrated clean energy ecosystem by establishing alliances with like-minded leaders in offshore, electric vehicles and renewable energy technology, as well as developing a transparent provenance strategy to enable DeepGreen to establish clean metals as a new purchasing category. Ms. Ilves is an entrepreneur and seasoned strategy lead dedicated to creating the systems and conditions required to secure a safe future for the human species. From November 2015 until December 2018, Ms. Ilves served as a director and Head of Machine Learning for OffWorld, Inc., an industrial robotics company that she co-founded, where she led a team of machine learning engineers to develop teachable mining robots. From November 2013 until November 2016, Ms. Ilves also served as Chief Strategy Officer for Shackleton Energy, a company she co-founded, where she developed an international public-private consortium to create technologies to extract water ice from the moon in order to fuel deep space missions from low Earth orbit, drastically reducing the costs of such missions. Mr. Ilves' 15 years of strategy consulting experience started with McKinsey & Company, where she served global and emerging markets financial institutions on strategy, performance and operational transformations; and later advised governments and investors of the Gulf Cooperation Council on transitioning to a green economy. From 2006 to 2007, Ms. Ilves served as Chief Organization Officer of TANDBERD, a videoconferencing technology firm acquired by Cisco Systems Inc. in 2010, where she was responsible for developing leadership and sales capability for the firm's global sales force. In 1999, Ms. Ives attended Emory Law School as a research scholarship recipient. Ms. Ilves earned a LL.M. from the Central European University and a LL.B. from the University of Tartu.

Craig Shesky has agreed to serve as TMC's Chief Financial Officer upon the closing of the Business Combination and has served as DeepGreen's Head of Financial Markets and Investor Relations since February 2021. Mr. Shesky has over 15 years combined experience in public investing, metals research and investment banking in New York. From August 2008 until July 2020, Mr. Shesky was employed by King Street Capital Management, most recently as senior analyst in charge of recommending investments the global metals & mining space. Mr. Shesky has analyzed electrification trends, battery chemistries and the resulting impacts on supply and demand for critical base metals, with particular expertise in nickel and copper. He also has significant experience navigating complex, legal-driven investments around the world, as King Street was one of the largest creditors in over a dozen global Lehman Brothers entities. From July 2006 to July 2008, Mr. Shesky served as an analyst on the insurance & asset management investment banking team at Morgan Stanley. Mr. Shesky graduated magna cum laude with a B.S. in Finance from the University of Notre Dame.

Gregory Stone, Ph.D. has agreed to serve as TMC's Chief Ocean Officer upon the closing of the Business Combination and has served as a Director and Chief Ocean Officer of DeepGreen since February 2018. In January 2020, Dr. Stone founded Pole-to-Pole, a non-profit organization with a mission to apply practical solutions to the problems facing Earth's ocean, and has been serving as the organization's Chairman since that time. Dr. Stone is an ocean scientist and explorer with over 10,000 dives throughout Earth's ocean down to 18,000 feet using submarines, SCUBA, underwater habitats and robotics. Dr. Stone is also widely known as a global thought leader who finds ways for humanity and the ocean to co-exist and support each other in the modern world. Dr. Stone was a catalysts at the genesis of the Ocean Health Index, a scientific framework used to measure oceans' health, and specializes in sustainable fishing, aquaculture, climate adaptation and seamount ecology. Dr. Stone's ability to communicate complex science is illustrated by his compelling TED and World Economic Forum talks, and his appearances in documentaries for the Discovery Channel and National Geographic. Dr. Stone has authored hundreds of publications including for Nature, National Geographic, and four books, one of which is a National Outdoor Book Award winner. Dr. Stone's numerous accolades and professional associations include the Explorers Club, Pew Fellowship for Marine Conservation, National Geographic Hero, the Boston Sea Rover's Diver of the year, Order of Kiribati Medal, the U.S. National Science Foundation/Navy Antarctic Service medal, and a NOGI Award from National Academy of Underwater Arts and Sciences. Dr. Stone is also a Senior Science Advisor to the Special Envoy for Ocean and the World Economic Forum Ocean Program, From September 2008 to February 2018,

Dr. Stone served as Chief Scientist for Conservation International and head of the Global Ocean Program. Dr. Stone earned a Ph.D. in Marine Science from the University of the South Pacific, a M.Sc. in Marine Policy from the University of Rhode Island and a B.A. in Human Ecology and Marine Biology from the College of the Atlantic.

Jeffrey Donald has agreed to serves as TMC's Head of Onshore Development upon the closing of the Business Combination and has served as DeepGreen's Head of Onshore Development and Processing since November 2015. Since 2019, Dr. Donald has served as President for Dr. JR Donald Consulting. Dr. Donald has over 20 years of international experience in the mining & metallurgy business. Dr. Donald is a specialist in the interface between business strategy, capital project scoping, technology and operational excellence. Dr. Donald is an expert at managing the business case development of complex strategic projects in challenging international environments with multiple stakeholder interests. Dr. Donald has a broad knowledge of all aspects of the mining industry; nickel in particular, with a basis in metallurgy and process engineering. Dr. Donald has extensive project development experience, having managed portfolios of complex, strategic projects including greenfield developments, major expansions, environmental improvement and compliance, commercialization of novel technologies and operations improvement programs during his tenures at Hatch, Inco, Vale, PT Vale Indonesia and SNC Lavalin. Dr. Donald earned a Ph.D. in Metallurgy and Materials Science from the University of Toronto, a M.Sc., as well as both a B.S. and a M.A.Sc in Metallurgical Engineering from Queen's University.

Corey McLachlan has agreed to serve as TMC's Head of Stakeholder Engagement upon the closing of the *Business* Combination and has served as DeepGreen's Head of Social Performance and Stakeholder Relations since January 2016. From July 2012 until December 2015, he served as Manager, Community and External Relations of Rio Tinto, Diavik Diamond Mines Inc. Mr. McLachlan earned a MSC in International Relations, International Political Economy from the University of Bristol and a B.A. in Political Science and Government from University of Calgary.

Scott Leonard is SOAC's Chief Executive Officer and on SOAC's board of directors and has been nominated to serve as a member of TMC's board of directors upon the closing of the Business Combination. Mr. Leonard has over 15 years of experience leading highly successful business transformations and transitions. Mr. Leonard also has deep expertise over the past 8 years driving decarbonization through technology adoption, product lifecycle management and development and industrial demand destruction. Mr. Leonard has held various roles at both public and private companies including Chief Executive Officer, Chief Financial Officer, Chief Restructuring Officer and Independent Director. Previously, Mr. Leonard served as Chief Financial Officer/Chief Restructuring Officer at GenOn Energy from 2017 until 2018, and Chief Executive Officer of GenOn Mid-Atlantic LLC in 2018. From 2014 to 2016, Mr. Leonard was at Hewlett Packard Enterprise (NYSE: HPE), where he served as the Senior Vice President of Global Commercial Functions for the Enterprise Services business. Prior to that, Mr. Leonard served as Deputy Executive Director, Chief Strategy & Administrative Officer for the Texas Department of Transportation from 2012 to 2014. From 2005 to 2012, Mr. Leonard held positions as Senior Vice President, Performance Improvement and Vice President, Corporate Planning at TXU Corp. and its successor Energy Future Holdings Corp. Mr. Leonard previously served on the board of directors of NRG REMA, LLC and Lonestar II Generation Holdings. Earlier in his career, Mr. Leonard was with McKinsey & Co. as a management consultant and Donaldson Lufkin & Jenrette as an investment banker. Mr. Leonard earned a B.S. with Highest Honors from Georgia Tech, and an M.B.A. with Distinction from The Kellogg Graduate School of Management at Northwestern. Mr. Leonard's qualifications to serve on the board of directors of TMC include his extensive experience in business transformations and transitions and his expertise in decarbonization technology adoption and product lifecycle management.

Christian Madsbjerg has been nominated to serve as a member of TMC's board of directors upon the closing of the Business Combination. Since 2019, Mr. Madsbjerg has served on the board of directors of Fritz Hansen A/S Copenhagen. Since August 2018, Mr. Madsbjerg has served as Professor of Applied Humanities at The New School for Social Research. Since January 2009, Mr. Madsbjerg has served as a director and senior partner of the consulting firm, ReD Associates, which he co-founded in August 2007. Mr. Madsbjerg is also a writer whose work has been featured in publications such as *The Wall Street Journal*, *Financial Times*, *The Washington Post*, *Der Spiegel*, and *Bloomberg Businessweek*. His latest book, *Sensemaking: The Power of the Humanities in the Age of the Algorithm*, was published in the spring of 2017 by Hachette Book Group. His book *The Moment of Clarity*, co-written with ReD partner Mikkel B. Rasmussen, was published by Harvard Business Press in the fall of 2014. He studied philosophy and political science in Copenhagen and London and has a Masters from the University of London. Mr. Madsbjerg's qualifications to serve on the board of directors of TMC include his expertise in advising senior executives, including the practical application of the human sciences in business.

Andrew Hall has been nominated to serve as a member of TMC's board of directors upon the closing of the Business Combination. Mr. Hall is an internationally experienced executive and non-executive in the renewable energy technologies and services sector. Since July 2018, Mr. Hall has served as Managing Director of Saxjo Limited, a renewable energy consultancy company. Previously, Mr. Hall was Group Chief Financial Officer at Siemens Gamesa Renewable Energy SA, one of the largest companies in the wind and renewables industry, from April 2017 to November 2017. From October 2015 to March 2017, Mr. Hall served as Group Chief Financial Officer and Executive Director at Siemens Wind Power GmbH & Co KG, a wind turbine original equipment manufacturer. Prior to that, Mr. Hall held a number of senior positions in other divisions of Siemens AG, including Chief Financial Officer and Board Member at Siemens Holdings plc & Cluster North West Europe in London from 2012 to 2015 and Chief Financial Officer and Board Member at Siemens Ltd & Cluster Africa in Johannesburg from 2008 to 2012. Mr. Hall currently serves on the board of a portfolio of venture capital, private equity and family office-backed companies in the renewable energy sector. Since September 2019, Mr. Hall has been Executive Chair of Star Windco Limited, a company providing wind turbine erection services. Since October 2018, Mr. Hall has been a non-executive director of Time to Act Limited, which specializes in metal coatings for the gas turbine and hydrogen industries. Additionally, Mr. Hall has served as Chair of New Motion Labs Limited, which licenses technology for the manufacture of mechanical drives, since June 2019, and as Senior Independent Director of Hero Future Energies Global Limited, a global renewable energy developer, since February 2019. Previously, Mr. Hall served as a board member A2Sea AS from 2015 to 2017, Voith Hydro GmbH & Co KG from 2015 to 2017 and Mimica Labs from 2014 to 2017. Mr. Hall earned a M.Sc. & B.Sc. from the University of Cape Town and an M.B.A. from the London Business School. Mr. Hall's qualifications to serve on the board of directors of TMC include his extensive international experience leading large, capital-intensive businesses in the renewable energy sector.

Eric Branderiz has been nominated to serve as a member of TMC's board of directors upon the closing of the Business Combination. Mr. Branderiz is an experienced executive in the renewable energy equipment and services industry. Since June 2018, Mr. Branderiz has served as Vice President and Chief Financial Officer of Enphase Energy, Inc., a global solar energy technology company, and became Executive Vice President of the company in February 2020. Previously, Mr. Branderiz served as Chief Accounting Officer and Corporate Controller of Tesla, Inc., an automotive and renewable energy company, from October 2016 to March 2018. Prior to Tesla, Inc., Mr. Branderiz held various positions at Sunpower Corporation, a solar energy system design and manufacturing company, including: Senior Vice President, Corporate Accounting Officer and Head of Corporate Tax from March 2016 to September 2016; Senior Vice President, Chief Accounting Officer and Head of Corporate Financial Planning and Analysis from September 2014 to February 2016; Senior Vice President, Chief Accounting Officer and Head of Global Residential and Light Commercial Operations and Finance from March 2013 to August 2014; and Senior Vice President, Chief Accounting Officer and Corporate Controller from June 2010 to February 2013. In addition, Mr. Branderiz held various senior positions at the Knowledge Learning Corporation from 2009 to 2010, Spansion, Inc. from 2005 to 2009 and Advanced Micro Devices, Inc. from 2002 to 2005. Mr. Branderiz is a certified public accountant licensed by the California Board of Accountancy and received a business commerce degree from the University of Alberta. Mr. Branderiz's qualifications to serve on the board of directors of TMC include his financial expertise and extensive leadership in the renewable energy industry.

Sheila Khama has been nominated to serve as a director of TMC's board of directors upon the closing of the Business Combination. Ms. Khama is a consultant, policy advisor and former mining industry executive with expertise in corporate governance and sustainable development of minerals, oil and gas resources. Since April 2019, Ms. Khama has been an independent consultant on oil and gas governance and policy reforms for SK Consulting Pty, Ltd. From November 2016 to March 2019, Ms. Khama served as Practice Manager and Coordinator of Donor Relations and Partnerships at The World Bank, where she led an international team of mineral, oil and gas specialists in implementing support programs ranging from policy reforms, technical assistance, research and knowledge dissemination for various countries. From November 2013 to November 2016, Ms. Khama served as Director African Natural Resources Center at the African Development Bank in Tunisia, where she led a support program for African governments to improve development outcomes from renewable and non-renewable resources. From 2010 to 2013, Ms. Khama served as Director of the Extractives Advisory Program at the African Center for Economic Transformation, a pan-African think tank based in Ghana. Ms. Khama also previously held a number of senior roles in the private sector, including Chief Executive Officer of De Beers Botswana from 2005 to 2010, Head of Marketing and Communication at the First National Bank of Botswana Ltd from 2002 to 2005, and Group

Secretary of the Anglo American Corporation Botswana from 1994 to 2002. Ms. Khama also currently serves as a Non-Executive Director for Tullow Oil plc, a position she has held since June 2019. Ms. Khama received an M.B.A. in General Management from Edinburgh University and a B.A. from the University of Botswana. Ms. Khama's qualifications to serve on the board of directors of TMC include her extensive experience as a corporate strategist and her deep understanding of regulatory frameworks in the minerals, oil and gas industry.

Andrei Karkar has been nominated to serve as a director of TMC's board of directors upon the closing of the Business Combination. Mr. Karkar has served as a director of DeepGreen since March 2019. Since 2006, Mr. Karkar has served as Chief Executive Officer of ERAS Holdings, a Karkar family office with its origins in Karkar Electronics founded in 1959 by Edward Karkar. ERAS Holdings engages in a broad range of investment activities and invests in a wide variety of asset classes. Since July 2019, Mr. Karkar has served as a member of the board of directors of CognitionX, a private company based in the United Kingdom. Mr. Karkar received a B.A. from Georgetown University. Mr. Karkar's qualifications to serve on the board of directors of TMC include his experience as an advisor and investor in public and private companies.

Riva Krut has been nominated to serve as a director of TMC following the closing of the Business Combination effective September 1, 2021. Dr. Krut is an industry expert on ESG and corporate sustainability with over 30 years of experience in establishing and leading sustainable development strategy. In April 2021, Dr. Krut retired from her role as Vice President and Chief Sustainability Officer of Linde plc, a leading global industrial gases and engineering company, a position she held since the creation of the company through the merger of Linde AG and Praxair, Inc. in October 2018. Prior to this merger, Dr. Krut served as Vice President and Chief Sustainable Development Officer of Praxair, Inc. from February 2007 to October 2018. Prior to joining Praxair, Dr. Krut was a regional vice president for Cameron Cole, LLC, a national environmental firm, leading their sustainability practice from 2002 to 2006. Dr. Krut currently serves as a member of the Sustainability Accounting Standards Board of the Standards Advisory Group and as a commissioner on the Land & Conservation Commission of the Town of Cumberland, Maine. Additionally, Dr. Krut has previously served as chair of Global Reporting Initiative and as a member of the Carbon Disclosure Standards Board. Dr. Krut also served for more than a decade on the board of Green Seal, Inc., the premier US-based eco-labeling organization. Dr. Krut received her PhD in history from London University School of Oriental & African Studies and her B.A. (Hons), 1st Class, from the University of the Witwatersrand, Johannesburg. Dr. Krut also holds a Harvard Business School HBX certificate in Sustainable Business Strategy. Dr. Krut's qualifications to serve on the board of directors of TMC include her extensive knowledge of and industry experience leading ESG and corporate sustainability initiatives.

There are no family relationships between or among any of TMC's directors or executive officers.

Corporate Governance

TMC will structure its corporate governance in a manner that DeepGreen and SOAC believe will closely align TMC's interests with those of its shareholders following the Business Combination. Notable features of this corporate governance include:

- TMC will have independent director representation on its audit committee immediately at the time of the Business Combination, and its independent directors will meet regularly in executive sessions without the presence of its corporate officers or non-independent directors;
- at least one of its directors will qualify as an "audit committee financial expert" as defined by the SEC; and
- it will implement a range of other corporate governance best practices, including placing limits on the number of directorships held by its directors to prevent "overboarding" and implementing a robust director education program.

Role of Board in Risk Oversight

The board of directors will have extensive involvement in the oversight of risk management related to TMC and its business and will accomplish this oversight through the regular reporting to the board of directors by the audit committee. The audit committee will represent the board of directors by periodically reviewing TMC's accounting, reporting and financial practices, including the integrity of its financial statements, the surveillance of administrative

and financial controls and its compliance with legal and regulatory requirements. Through its regular meetings with management, including the finance, legal, internal audit and information technology functions, the audit committee will review and discuss all significant areas of TMC's business and summarize for the board of directors all areas of risk and the appropriate mitigating factors. In addition, the board of directors will receive periodic detailed operating performance reviews from management.

Composition of the TMC Board of Directors After the Business Combination

TMC's business and affairs will be managed under the direction of its board of directors. Following the Business Combination, the board of directors will remain declassified and the directors will be elected annually.

Board Committees

After the completion of the Business Combination, the standing committees of the TMC Board will consist of an audit committee, a compensation committee and a nominating and corporate governance committee. The TMC Board may from time to time establish other committees.

TMC's chief executive officer and other executive officers will regularly report to the non-executive directors and the audit, the compensation and the nominating and corporate governance committees to ensure effective and efficient oversight of our activities and to assist in proper risk management and the ongoing evaluation of management controls. We believe that the leadership structure of the TMC Board will provide appropriate risk oversight of TMC's activities given the controlling interests held by our Chairman and Chief Executive Officer Gerard Barron.

Audit Committee

Upon the completion of the Business Combination, we expect TMC to have an audit committee, consisting of Eric Branderiz, who will be serving as the chairperson, Andrew Hall and Scott Leonard. Each proposed member of the audit committee qualifies as an independent director under the NASDAQ corporate governance standards and the independence requirements of Rule 10A-3 under the Exchange Act. Following the Business Combination, the TMC Board will determine which member of its audit committee qualifies as an "audit committee financial expert" as such term is defined in Item 407(d)(5) of Regulation S-K and possesses financial sophistication, as defined under the rules of NASDAQ.

The purpose of the audit committee will be to prepare the audit committee report required by the SEC to be included in TMC's proxy statement and to assist the board of directors in overseeing and monitoring (1) the quality and integrity of the financial statements, (2) compliance with legal and regulatory requirements, (3) TMC's independent registered public accounting firm's qualifications and independence, (4) the performance of TMC's internal audit function and (5) the performance of TMC's independent registered public accounting firm.

The board of directors will adopt a written charter for the audit committee which will be available on TMC's website upon the completion of the Business Combination.

Compensation Committee

Upon the completion of the Business Combination, we expect TMC to have a compensation committee, consisting of Sheila Khama, who will be serving as the chairperson, Andrew Hall and Christian Madsbjerg.

The purpose of the compensation committee is to assist the board of directors in discharging its responsibilities relating to (1) setting TMC's compensation program and compensation of its executive officers and directors, (2) monitoring TMC's incentive and equity-based compensation plans and (3) preparing the compensation committee report required to be included in TMC's proxy statement under the rules and regulations of the SEC.

The board of directors will adopt a written charter for the compensation committee which will be available on TMC's website upon the completion of the Business Combination.

Nominating and Corporate Governance Committee

Upon the completion of the Business Combination, we expect TMC to have a nominating and corporate governance committee, consisting of Scott Leonard, who will be serving as the chairperson, Sheila Khama and Christian Madsbjerg. The purpose of the nominating and corporate governance committee will be to assist the board of directors in discharging its responsibilities relating to (1) identifying individuals qualified to become new board of directors members, consistent with criteria approved by the board of directors, (2) reviewing the qualifications of incumbent directors to determine whether to recommend them for reelection and selecting, or recommending that the board of directors select, the director nominees for the next annual meeting of shareholders, (3) identifying board of directors members qualified to fill vacancies on any board of directors committee and recommending that the board of directors appoint the identified member or members to the applicable committee, (4) reviewing and recommending to the board of directors corporate governance principles applicable to TMC, (5) overseeing the evaluation of the board of directors and management and (6) handling such other matters that are specifically delegated to the committee by the board of directors from time to time.

The board of directors will adopt a written charter for the nominating and corporate governance committee which will be available on TMC's website upon completion of the Business Combination.

Code of Business Conduct

TMC will adopt a new code of business conduct that applies to all of its directors, officers and employees, including its principal executive officer, principal financial officer and principal accounting officer, which will be available on TMC's website upon the completion of the Business Combination. TMC's code of business conduct is a "code of ethics," as defined in Item 406(b) of Regulation S-K. Please note that TMC's Internet website address is provided as an inactive textual reference only. TMC will make any legally required disclosures regarding amendments to, or waivers of, provisions of its code of ethics on its Internet website.

Compensation Committee Interlocks and Insider Participation

No member of the DeepGreen compensation committee was at any time during fiscal year 2020, or at any other time, one of DeepGreen's officers or employees. None of DeepGreen's executive officers has served as a director or member of a compensation committee (or other committee serving an equivalent function) of any entity, one of whose executive officers served as a director of the DeepGreen Board or member of DeepGreen's compensation committee.

Independence of the Board of Directors

NASDAQ rules generally require that independent directors must comprise a majority of a listed company's board of directors. Based upon information requested from and provided by each proposed director concerning his or her background, employment and affiliations, including family relationships, we have determined that Andrew Hall, Eric Branderiz, Scott Leonard, Sheila Khama, Christian Madsbjerg, Riva Krut and Andrei Karkar, representing seven of TMC's eight proposed directors, will be "independent" as that term is defined under the applicable rules and regulations of the SEC and the listing requirements and rules of NASDAQ. Andrew Hall shall serve as the Lead Independent Director of the TMC board of directors.

Compensation of Directors and Executive Officers

Overview

Following the Closing of the Business Combination, we expect TMC's executive compensation program to be consistent with DeepGreen's existing compensation policies and philosophies, which are designed to:

- attract, retain and motivate senior management leaders who are capable of advancing DeepGreen's mission and strategy and, ultimately, creating and maintaining its long-term equity value. Such leaders must engage in a collaborative approach and possess the ability to execute its business strategy in an industry characterized by competitiveness and growth;

- reward senior management in a manner aligned with DeepGreen's financial performance; and
- align senior management's interests with DeepGreen's equity owners' long-term interests through equity participation and ownership.

Following the Closing of the Business Combination, decisions with respect to the compensation of TMC's executive officers, including its named executive officers, will be made by the compensation committee of the board of directors. The following discussion is based on the present expectations as to the compensation of the named executive officers and directors following the Business Combination. The actual compensation of the named executive officers will depend on the judgment of the members of the compensation committee and may differ from that set forth in the following discussion.

We anticipate that compensation for TMC's executive officers will have the following components: base salary, cash bonus opportunities, long-term incentive compensation, broad-based employee benefits, supplemental executive perquisites and severance benefits. Base salaries, broad-based employee benefits, supplemental executive perquisites and severance benefits will be designed to attract and retain senior management talent. TMC will also use cash bonuses and long-term equity awards to promote performance-based pay that aligns the interests of its named executive officers with the long-term interests of its equity owners and to enhance executive retention.

Base Salary

We expect that TMC's named executive officers' base salaries in effect prior to the Business Combination will continue as described under "*TMC Management after the Business Combination — Compensation of Directors and Executive Officers*" will be subject to increases made in connection with DeepGreen's annual review of its named executive officers' base salaries, and be reviewed annually by the compensation committee.

Annual Bonuses

We expect that TMC will use annual cash incentive bonuses for the named executive officers to motivate their achievement of short-term performance goals and tie a portion of their cash compensation to performance. We expect that, near the beginning of each year, the compensation committee will select the performance targets, target amounts, target award opportunities and other terms and conditions of annual cash bonuses for the named executive officers, subject to the terms of their employment agreements. Following the end of each year, the compensation committee will determine the extent to which the performance targets were achieved and the amount of the award that is payable to the named executive officers.

Stock-Based Awards

We expect TMC to use stock-based awards in future years to promote its interests by providing the executives with the opportunity to acquire equity interests as an incentive for their remaining in its service and aligning the executives' interests with those of TMC's equity holders. Stock-based awards will be awarded in future years under the TMC 2021 Incentive Equity Plan, which has been adopted by the SOAC Board and is being submitted to SOAC's stockholders for approval at the Special Meeting. For a description of the TMC Incentive Equity Plan, please see "*The Incentive Award Plan Proposal*."

Other Compensation

We expect TMC to continue to maintain various broad-based employee benefit plans, including medical, dental, vision, life insurance and 401(k) plans, paid vacation, sick leave and holidays and employee assistance program benefits in which the named executive officers may participate. We also expect TMC to provide its named executive officers with specified perquisites and personal benefits.

Director Compensation

Following the Business Combination, non-employee directors of TMC that are not affiliated with SOAC will receive varying levels of compensation for their services as directors and members of committees of the TMC Board. TMC anticipates determining director compensation in accordance with industry practice and standards.

BENEFICIAL OWNERSHIP OF SECURITIES

The following table sets forth information regarding the beneficial ownership of SOAC Ordinary Shares as of the record date and of TMC Common Shares immediately following consummation of the Business Combination by:

- each person known by SOAC to be the beneficial owner of more than 5% of SOAC's outstanding Ordinary Shares on the record date;
- each person known by SOAC who may become beneficial owner of more than 5% of TMC Common Shares outstanding immediately following the Business Combination;
- each of SOAC's current executive officers and directors;
- each person who will become an executive officer or a director of TMC upon consummation of the Business Combination;
- all of SOAC's current executive officers and directors as a group; and
- all of TMC's executive officers and directors as a group after the consummation of the Business Combination.

Beneficial ownership is determined according to the rules of the SEC, which generally provide that a person has beneficial ownership of a security if he, she or it possesses sole or shared voting or investment power over that security.

	Prior to Business Combination				After Business Combination			
					Assuming No Redemption		Assuming Maximum Redemption	
Name and Address of Beneficial Owners[1]	Number of Class A Shares	%	Number of Class B Shares	%	Number of Shares	%	Number of Shares	%
Directors and officers prior to the Business Combination:								
Scott Leonard[2]	—	—	7,410,000	98.8%	6,669,000	2.2%	6,669,000	2.5%
Scott Honour[2]	—	—	7,410,000	98.8%	6,669,000	2.2%	6,669,000	2.5%
David Quiram	—	—	—	—	—	0.0%	—	0.0%
Rick Gaenzle	—	—	30,000	*	30,000	*	30,000	*
Isaac Barchas	—	—	30,000	*	30,000	*	30,000	*
Justin Kelly	—	—	30,000	*	30,000	*	30,000	*
All directors and officers prior to the Business Combination (six persons)	—	—	7,500,000	100%	6,759,000	2.3%	6,759,000	2.5%
Five Percent Holders prior to the Business Combination:			—	—				
Highbridge Capital Management, LLC[3]	1,801,463	6.0%	—	—	1,801,463	*	—	0.0%
Periscope Capital[4]	1,746,609	5.8%	—	—	1,746,609	*	—	0.0%
Glazer Capital, LLC[5]	1,532,363	5.1%	—	—	1,532,363	*	—	0.0%
Millennium Management LLC[6]	1,518,755	5.1%	—		1,518,755	*	—	0.0%
Directors and officers after the Business Combination:								
Gerard Barron[7]	—	—	—	—	18,863,598	6.2%	18,863,598	6.9%
Anthony O'Sullivan[8]	—	—	—	—	1,269,612	*	1,269,612	*
Erika Ilves[9]	—	—	—	—	1,735,983	*	1,735,983	*
Craig Shesky[15]	—	—	—	—	177,705	*	177,705	*
Dr. Gregory Stone[10]	—	—	—	—	1,175,554	*	1,175,554	*
Jeffrey Donald[11]	—	—	—	—	543,608	*	543,608	*
Corey McLachlan[12]	—	—	—	—	648,931	*	648,931	*
Scott Leonard	—	—	7,410,000	98.8%	6,669,000	2.2%	6,669,000	2.5%
Christian Madsbjerg[13]	—	—	—	—	303,152	*	303,152	*

Name and Address of Beneficial Owners[1]	Prior to Business Combination				After Business Combination			
					Assuming No Redemption		Assuming Maximum Redemption	
	Number of Class A Shares	%	Number of Class B Shares	%	Number of Shares	%	Number of Shares	%
Andrew Hall	—	—	—	—	—	0.0%	—	0.0%
Eric Branderiz	—	—	—	—	—	0.0%	—	0.0%
Sheila Khama	—	—	—	—	—	0.0%	—	0.0%
Andrei Karkar[14] [16]	—	—	—	—	42,895,924	14.2%	42,895,924	15.8%
Riva Krut	—	—	—	—	—	0.0%	—	0.0%
All directors and officers after the Business Combination as a group (14 persons)	—	—	710,000	—	74,283,067	23.9%	74,283,067	26.5%
Five Percent Holders:								
ERAS Capital[14]	—	—	—	—	42,254,640	14.1%	42,254,640	15.6%
Ramas Energy Opportunities I, L.P.	—	—	—	—	20,000,000	6.7%	20,000,000	7.4%
Maersk Supply Service A/S	—	—	—	—	19,600,514	6.5%	19,600,514	7.2%

* Less than 1%

(1) Unless otherwise noted, the business address of each of our shareholders is 1601 Bryan Street, Suite 4141, Dallas, TX 75201.

(2) Scott Leonard and Scott Honour are the managers of our Sponsor and share voting and dispositive power over the securities held by our Sponsor and therefore each may be deemed to be a beneficial owner thereof.

(3) The address of Highbridge Capital Management, LLC ("Highbridge") is 277 Park Avenue, 23rd Floor, New York, New York 10172, based on a Schedule 13G filed on May 20, 2021 (the "Highbridge 13G"). According to the Highbridge 13G, Highbridge, as the trading manager of Highbridge Tactical Credit Master Fund, L.P. and Highbridge SPAC Opportunity Fund, L.P. (collectively, the "Highbridge Funds"), may be deemed to be the beneficial owner of the 1,801,463 Class A ordinary shares held by the Highbridge Funds. However, the Highbridge 13G states that the foregoing should not be construed in and of itself as an admission by Highbridge as to beneficial ownership of the Class A Ordinary Shares held by the Highbridge Funds.

(4) The address of Periscope Capital Inc. is 333 Bay Street, Suite 1240, Toronto, Ontario, Canada M5H 2R2, based on a Schedule 13G filed on February 16, 2021 (the "Periscope 13G"). According to the Periscope 13G, Periscope Capital Inc. beneficially owns 1,282,132 shares of Class A ordinary shares and acts as investment manager of, and exercises investment discretion with respect to, certain private investment funds that collectively directly own 464,477 Class A ordinary shares.

(5) The address of Glazer Capital, LLC ("Glazer Capital") is 250 West 55th Street, Suite 30A, New York, New York 10019, based on a Schedule 13G/A filed on February 16, 2021 (the "Glazer 13G"). According to the Glazer 13G, Mr. Paul Glazer ("Mr. Glazer") is the managing member of Glazer Capital and therefore Mr. Glazer may be deemed to have beneficial ownership of the shares of Class A ordinary shares directly owned by Glazer Capital.

(6) The address of Millennium Management LLC is 399 Park Avenue, New York, New York 10022, based on a Schedule 13G filed on April 1, 2021 (the "Millennium 13G"). According to the Millennium 13G, Integrated Core Strategies (US) LLC ("Integrated Core Strategies") was the beneficial owner of 961,619 Class A ordinary shares and ICS Opportunities, Ltd. ("ICS Opportunities") was the beneficial owner of 557,136 Class A ordinary shares. Millennium International Management LP ("Millennium International Management") is the investment manager to ICS Opportunities and may be deemed to have shared voting control and investment discretion over securities owned by ICS Opportunities. Millennium Management LLC ("Millennium Management") is the general partner of the managing member of Integrated Core Strategies and may be deemed to have shared voting control and investment discretion over securities owned by Integrated Core Strategies. Millennium Management is also the general partner of the 100% owner of ICS Opportunities and may also be deemed to have shared voting control and investment discretion over securities owned by ICS Opportunities. Millennium Group Management LLC ("Millennium Group Management") is the managing member of Millennium Management and may also be deemed to have shared voting control and investment discretion over securities owned by Integrated Core Strategies. Millennium Group Management is also the general partner of Millennium International Management and may also be deemed to have shared voting control and investment discretion over securities owned by ICS Opportunities. The managing member of Millennium Group Management is a trust of which Israel A. Englander ("Mr. Englander") currently serves as the sole voting trustee. Therefore, Mr. Englander may also be deemed to have shared voting control and investment discretion over securities owned by Integrated Core Strategies and ICS Opportunities.

However, the reporting parties state that the foregoing should not be construed in and of itself as an admission by Millennium International Management, Millennium Management, Millennium Group Management or Mr. Englander as to beneficial ownership of the securities owned by Integrated Core Strategies or ICS Opportunities.

(7) Consists of (i) 14,756,995 TMC Common Shares issuable upon consummation of the Business Combination, in exchange for 12,456,406 DeepGreen Common Shares (including 200,000 DeepGreen Preferred Shares that will be automatically converted into DeepGreen Common Shares prior to the consummation of the Business Combination), and (ii) options to purchase 4,106,603 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Mr. Barron.

(8) Consists of options to purchase 1,269,612 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Mr. O'Sullivan.

(9) Consists of (i) 364,366 TMC Common Shares issuable upon consummation of the Business Combination, in exchange for 312,500 DeepGreen Common Shares, and (ii) options to purchase 1,371,617 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Ms. Ilves.

(10) Consists of (i) 35,057 TMC Common Shares issuable upon consummation of the Business Combination, in exchange for 30,067 DeepGreen Common Shares, and (ii) options to purchase 1,140,497 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Dr. Stone.

(11) Consists of options to purchase 543,608 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Mr. Donald.

(12) Consists of (i) 13,432 TMC Common Shares issuable upon consummation of the Business Combination, in exchange for 11,520 DeepGreen Common Shares, and (ii) options to purchase 635,499 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Mr. McLachlan.

(13) Consists of options to purchase 303,152 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Mr. Madsbjerg.

(14) The address of ERAS Capital ("ERAS") is 323 Marina Boulevard, San Francisco, California 94123. ERAS is controlled by Andrei Karkar, a director of DeepGreen and a director nominee of TMC.

(15) Consists of 177,705 TMC Common Shares issuable upon consummation of the Business Combination, in exchange for 152,410 DeepGreen Common Shares, of which 85,744 DeepGreen Common Shares are held indirectly by Empire, a Series of Cathode Holdings LLC.

(16) Includes shares beneficially owned by ERAS and options to purchase 641,284 TMC Common Shares issuable upon assumption by TMC of options to purchase DeepGreen Common Shares exercisable within 60 days of May 20, 2021 held by Mr. Karkar.

CERTAIN RELATIONSHIPS AND RELATED PERSON TRANSACTIONS

Certain Relationships and Related Person Transactions — SOAC

Founder Shares

On December 31, 2019, the Sponsor purchased 8,625,000 shares (the "Founder Shares") of SOAC's Class B ordinary shares, par value $0.0001 for an aggregate price of $25,000. In March 2020, the Sponsor transferred 30,000 Founder Shares to each of SOAC's independent directors. Upon the Continuance, the Founder Shares will become TMC Common Shares. The Sponsor had agreed to forfeit up to 1,125,000 Founder Shares to the extent that the over-allotment option was not exercised in full by the underwriter so that the Founder Shares will represent 20% of SOAC's issued and outstanding shares after the initial public offering. The over-allotment option expired in June 2020; thus, these Founder Shares were forfeited accordingly.

The initial shareholders agreed, subject to limited exceptions, not to transfer, assign or sell any of their Founder Shares until the earlier to occur of: (A) one year after the completion of the initial business combination; or (B) subsequent to the initial business combination, (x) if the last sale price of the Class A ordinary shares equals or exceeds $12.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after the initial business combination, or (y) the date on which SOAC completes a liquidation, merger, share exchange or other similar transaction that results in all of SOAC's shareholders having the right to exchange their Class A ordinary shares for cash, securities or other property.

Private Placement Warrants

Simultaneously with the closing of the initial public offering, SOAC consummated the private placement of 9,500,000 private placement warrants at a price of $1.00 per private placement warrant to the Sponsor, generating gross proceeds of $9.5 million. Each private placement warrant is exercisable for one whole Class A ordinary share at a price of $11.50 per share.

A portion of the proceeds from the sale of the private placement warrants was added to the proceeds from the initial public offering held in the trust account. If SOAC does not complete a Business Combination within the Combination Period, the private placement warrants will expire worthless. The private placement warrants will be non-redeemable and exercisable on a cashless basis so long as they are held by the Sponsor or its permitted transferees.

The Sponsor and SOAC's officers and directors agreed, subject to limited exceptions, not to transfer, assign or sell any of their private placement warrants until 30 days after the completion of the initial business combination.

Related Party Loans

On December 31, 2019, Sponsor agreed to loan SOAC an aggregate of up to $300,000 to cover expenses related to SOAC's initial public offering pursuant to a promissory note (the "Note"). This loan was non-interest bearing and payable on the earlier of December 31, 2020 or the completion of the initial public offering. Sponsor paid an aggregate of approximately $163,000 to cover for expenses on SOAC's behalf under the Note. On May 8, 2020, SOAC repaid the Note in full.

In addition, in order to finance transaction costs in connection with an intended initial business combination, Sponsor or an affiliate of Sponsor or certain of our officers and directors may, but are not obligated to, loan us funds as may be required (the "Working Capital Loans"). If SOAC completes a business combination, it would repay such loaned amounts out of the proceeds of the trust account released to SOAC. In the event a business combination does not close, the Working Capital Loans would be repaid only out of funds held outside the trust account. In the event that our initial business combination does not close, SOAC may use a portion of the working capital held outside the trust account to repay the Working Capital Loans but no proceeds from our trust account would be used to repay the Working Capital Loans. Up to $1,500,000 of such loans may be convertible into warrants of the post-Business Combination entity at a price of $1.50 per warrant at the option of the lender and with DeepGreen's consent. The warrants would be identical to the private placement warrants. To date, SOAC had no outstanding borrowings under this arrangement.

Administrative Support Agreement

SOAC entered into an agreement, commencing on May 8, 2020 through the earlier of the SOAC's consummation of a Business Combination and its liquidation, to reimburse Sponsor a total of $10,000 per month for office space, secretarial and administrative services. We incurred and paid $80,000 and $0 in expenses in connection with such services and recorded in general and administrative expenses in the statements of operations for the year ended December 31, 2020, and for the period December 18, 2019 (inception) to December 31, 2019 respectively. We incurred and paid $30,000 and $0 in expenses in connection with such services and recorded in general and administrative expenses in the statements of operations for the three months ended March 31, 2021, and 2020, respectively.

Certain Relationships and Related Person Transactions — DeepGreen

2019 Private Placement

In 2019, DeepGreen sold 10,185,811 DeepGreen Common Shares at a price per share of $1.75 in a private placement transaction for total gross proceeds of $26,158,504. In connection therewith, ERAS Capital, an entity controlled by Andrei Karkar and an owner of more than 5% of DeepGreen's stock, purchased 2,857,143 shares in the offering for an aggregate purchase price of $5,000,000.

2020 Private Placement

In 2020, DeepGreen sold 5,659,920 DeepGreen Common Shares at a price per share of $3.60 in a private placement transaction for total gross proceeds of $20,375,712. In connection therewith, (i) Gerard Barron, DeepGreen's Chief Executive Officer and an owner of more than 5% of DeepGreen's stock, purchased 208,333 shares in the offering for an aggregate purchase price of $749,999 on August 7, 2020, and (ii) ERAS Capital, an entity controlled by Andrei Karkar and an owner of more than 5% of DeepGreen's stock, purchased 2,083,333 shares in the offering for an aggregate purchase price of $7,499,999 on July 13, 2020.

Consulting Agreements

DGE is party to a consulting agreement with SSCS Pte. Ltd. ("SSCS"), an entity that is wholly-owned by John Machin, our Head of Offshore Engineering, to manage offshore engineering studies. Mr. Machin is also a director of DGE. Consulting services during the year ended December 31, 2020 amounted to $275,000, and consulting services for the year ended December 31, 2019 amounted to $248,308. As of December 31, 2020, the amount payable to SSCS amounted to $22,917.

Gregory Stone, DeepGreen's Chief Ocean Scientist regularly provides consulting services to DeepGreen through Ocean Renaissance LLC ("Ocean Renaissance"), where he is a principal. Consulting services during the year ended December 31, 2020 amounted to $366,667, and consulting services during the year ended December 31, 2019 amounted to $354,999. As of December 31, 2020, the additional amounts payable to Ocean Renaissance amounted to $175.

Jeffrey Donald, DeepGreen's Head of Onshore Development, provides consulting services through Dr. JR Donald Consulting Services Inc. ("JR Donald Consulting"), where he is President. In exchange for consulting services, JR Donald Consulting receives a base fee equal to CAD$330,000, payable by DeepGreen in equal monthly amounts per annum. Consulting services during the year ended December 31, 2020 amounted to $330,000, and consulting services for the year ended December 31, 2019 amounted to $321,129.

Transaction Support Agreements

Concurrently with the execution of the Business Combination Agreement, certain DeepGreen Securityholders entered into shareholder support agreements (the "Transaction Support Agreements") pursuant to which each such holder agreed (i) to vote at any meeting of the securityholders of DeepGreen all of its securities held of record or thereafter acquired and entitled to vote in favor of the Business Combination and the ancillary documents thereto and the consummation of the Arrangement and the transactions contemplated thereby, (ii) irrevocably appoint SOAC or any individual designated by SOAC as such DeepGreen shareholder's attorney-in-fact, with full power of substitution in favor of SOAC, to take all such actions and execute and deliver such documents, instruments or agreements as are necessary to consummate the transaction contemplated by the Business Combination Agreement, including acting as a proxy, to attend on behalf of such DeepGreen shareholder, at any meeting of the DeepGreen

Securityholders with respect to the Business Combination, (iii) be bound by certain other covenants and agreements related to the Business Combination, and (iv) not to transfer such securities outside certain limited circumstances. The DeepGreen shareholders who entered into the Transaction Support Agreements and who are also directors, officers, and/or owners of more than 5% of DeepGreen Common Shares are: Gerard Baron, Andrei Karkar, Maersk, and Allseas.

Maersk

On March 21, 2017, DeepGreen entered into four charter vessel agreements with Maersk and one charter vessel agreement with Maersk UK (together, the "Maersk Supply Agreements") pursuant to which Maersk and Maersk UK agreed to supply DeepGreen with vessels and offshore services for a total of five marine campaigns. By letter agreement on March 3 2021, DeepGreen and Maersk agreed to extend the arrangement until 2022.

Pursuant to the Maersk Investment and Participation Agreement dated March 15, 2017 (the "Participation Agreement"), DeepGreen agreed, among other things, that in return for marine cruises and related project management services provided by Maersk and Maersk UK, DeepGreen will issue that number of DeepGreen common shares as is equal to the final cost of each marine cruise divided by $1.25 (subject to adjustment as described therein), upon completion of each marine cruise, and after agreement between the parties as to the calculation of the final cost to Maersk or Maersk UK for such cruise. As of March 2021, all unspent costs have now been agreed to be reimbursed in cash. Services valued at approximately $22.5 million have been delivered, with 17,982,123 shares issued to Maersk under the contract.

On March 3, 2021, DeepGreen entered into a letter agreement with Maersk and Maersk UK (the "Maersk Letter Agreement"), whereby Maersk and Maersk UK agreed to, among other matters, enter into certain commercial and other changes under the Investment Agreement. Pursuant to the Maersk Letter Agreement, Maersk irrevocably (i) waived certain pro rata participation rights that it may have under the Investment Agreement in connection with the Business Combination and contemplated PIPE transaction; (ii) acknowledged that all amounts owing to Maersk for services rendered through February 5, 2021 in the aggregate amount of $4.58 million had been satisfied by the issuance of 3,666,267 shares of DeepGreen at a price per share of $1.25; (iii) agreed that all final costs for services rendered from and after February 5, 2021 will be settled in cash, and that Maersk shall not be entitled to any further in-kind common share investment; and (iv) agreed to lower the charter vessel hire operational day rates.

As described herein, certain of DeepGreen's agreements with Allseas and Maersk are set to expire in 2022. Notably, with respect to Allseas, if the PMTS is delivered, the PMTA will terminate by its terms in 2022, whereas the overarching SAA will remain in place. Additionally, the Maersk Supply Agreements shall terminate by their terms in 2022. While Allseas and Maersk have communicated their intention to negotiate in good faith in order to extend the applicable arrangements, there are no guarantees that DeepGreen will be able to enter into new agreements on commercially reasonable terms, if at all.

PROPOSAL NO. 1 — CONTINUANCE PROPOSAL

Overview

As discussed in this proxy statement/prospectus, SOAC is asking its shareholders to approve the Continuance Proposal. Under the Business Combination Agreement, the approval of the Continuance Proposal is also a condition to the consummation of the Business Combination.

As a condition to closing the Business Combination, the board of directors of SOAC has unanimously approved, and SOAC shareholders are being asked to consider and vote upon a proposal to approve, a change of SOAC's jurisdiction of incorporation pursuant to which SOAC will migrate and be continued from the Cayman Islands to British Columbia, Canada and be domesticated as a company existing under the laws of British Columbia, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Division 8 of Part 9 of the BCBCA.

As a result and upon the consummation of the Continuance, (i) the identifying name of the Class A ordinary shares of SOAC, par value $0.0001 per share (the "Class A ordinary shares"), and Class B ordinary shares of SOAC, par value $0.0001 per share (the "Class B ordinary shares"), will be changed to common shares of TMC (the "TMC Common Shares") and the Class A ordinary shares and Class B ordinary shares will be changed from shares with par value to shares without par value; (ii) the rights and restrictions attached to the renamed Class A ordinary shares and Class B ordinary shares of SOAC will be deleted and the shares will have the rights and restrictions attached to the TMC Common Shares, as described in the notice of articles and articles of TMC; (iii) the number of authorized TMC Common Shares will be unlimited; (iv) each issued and outstanding whole warrant to purchase Class A ordinary shares will automatically represent the right to purchase one TMC Common Share at an exercise price of $11.50 per share on the terms and conditions set forth in the SOAC warrant agreement; (v) the notice of articles and articles of TMC will become the governing documents of SOAC; and (vi) SOAC's name will change to "TMC the metals company Inc."

As a condition to closing the Business Combination pursuant to the terms of the Business Combination Agreement, the board of directors of SOAC has unanimously approved the Continuance Proposal. The Continuance Proposal, if approved, will authorize a change of SOAC's jurisdiction of incorporation from the Cayman Islands to British Columbia, Canada. Accordingly, while SOAC is currently incorporated as an exempted company under the Cayman Islands Companies Law, upon the Continuance, TMC will be governed by the BCBCA. There are differences between Cayman Islands corporate law and British Columbia corporate law as well as the Existing Governing Documents and the TMC Notice and Articles. See "*Comparison of Corporate Governance and Shareholders Rights*" and "*Proposal No. — The Organizational Documents Proposal — Comparison of Shareholder Rights under the Applicable Organizational Documents Before and After the Continuance*." The approval of each of the Continuance Proposal and the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of holders at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

Reasons for the Continuance

Our board of directors believes that it is in the best interest of SOAC to migrate and be continued from the Cayman Islands to British Columbia, Canada in order to adequately address the needs of SOAC and its shareholders following the consummation of the Business Combination and as the parent company to DeepGreen, a company incorporated under the BCBCA.

Effect of the Continuance on Existing SOAC Equity

The Continuance will result in, among other things, the following, each of which will occur prior to the Effective Time:

- the identifying name of the Class A ordinary shares and Class B ordinary shares will be changed to TMC Common Shares and the Class A ordinary shares and Class B ordinary shares will be changed from shares with par value to shares without par value;

- the rights and restrictions attached to the renamed Class A ordinary shares and Class B ordinary shares of SOAC will be deleted and the shares will have the rights and restrictions attached to the TMC Common Shares, as described in the TMC Notice and Articles;
- the number of authorized TMC Common Shares will be unlimited;
- each issued and outstanding whole warrant to purchase Class A ordinary shares will automatically represent the right to purchase one TMC Common Share at an exercise price of $11.50 per share on the terms and conditions set forth in the SOAC warrant agreement;
- the TMC Notice and Articles will become the governing documents of SOAC; and
- SOAC's name will change to "TMC the metals company Inc."

Vote Required for Approval

The approval of the Continuance Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the extraordinary general meeting, and otherwise will have no effect on the proposal.

The Continuance Proposal is conditioned on the approval and adoption of each of the other Condition Precedent Proposals.

Resolution

The full text of the resolution to be passed is as follows:

"**RESOLVED**, as a special resolution, that SOAC migrate and be continued from the Cayman Islands to British Columbia, Canada pursuant to Part XII of the Companies Act (as Revised) of the Cayman Islands and Part 9, Division 8 of the BCBCA and, immediately upon being de-registered in the Cayman Islands, SOAC be continued as a company existing under the laws of British Columbia, Canada bearing the name 'TMC the metals company Inc.'"

Recommendation of the SOAC Board

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE CONTINUANCE PROPOSAL.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

PROPOSAL NO. 2 — BUSINESS COMBINATION PROPOSAL

Overview

We are asking our shareholders to adopt and approve the Business Combination Agreement, certain related agreements and the transactions contemplated thereby (including the Business Combination). SOAC shareholders should read carefully this proxy statement/prospectus in its entirety for more detailed information concerning the Business Combination Agreement, which is attached as Annex A to this proxy statement/prospectus, and the transactions contemplated thereby. Please see "*Business Combination Proposal — The Business Combination Agreement*" below for additional information and a summary of certain terms of the Business Combination Agreement. You are urged to read carefully the Business Combination Agreement in its entirety before voting on this proposal.

Because we are holding a shareholder vote on the Business Combination, we may consummate the Business Combination only if it is approved by the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter.

The Business Combination Agreement

This subsection of the proxy statement/prospectus describes the material provisions of the Business Combination Agreement, but does not purport to describe all of the terms of the Business Combination Agreement. The following summary is qualified in its entirety by reference to the complete text of the Business Combination Agreement, which is attached as Annex A to this proxy statement/prospectus. You are urged to read the Business Combination Agreement in its entirety because it is the primary legal document that governs the Business Combination.

The Business Combination Agreement contains representations, warranties and covenants that the respective parties made to each other as of the date of the Business Combination Agreement or other specific dates. The assertions embodied in those representations, warranties and covenants were made for purposes of the contract among the respective parties and are subject to important qualifications and limitations agreed to by the parties in connection with negotiating the Business Combination Agreement. The representations, warranties and covenants in the Business Combination Agreement are also modified in part by the underlying disclosure schedules (the "disclosure schedules"), which are not filed publicly and which are subject to a contractual standard of materiality different from that generally applicable to shareholders and were used for the purpose of allocating risk among the parties rather than establishing matters as facts. We do not believe that the disclosure schedules contain information that is material to an investment decision. Additionally, the representations and warranties of the parties to the Business Combination Agreement may or may not have been accurate as of any specific date and do not purport to be accurate as of the date of this proxy statement/prospectus. Accordingly, no person should rely on the representations and warranties in the Business Combination Agreement or the summaries thereof in this proxy statement/prospectus as characterizations of the actual state of facts about SOAC, Sponsor, DeepGreen or any other matter.

On March 4, 2021, SOAC, NewCo Sub and DeepGreen entered into the Business Combination Agreement, which provides for, among other things, that on the Closing Date, promptly following the Continuance, pursuant to the Arrangement: (i) SOAC will acquire all of the issued and outstanding DeepGreen Common Shares; (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and/or Deep Green Options, as applicable, the following shares or options to purchase the following shares: an aggregate of (a) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the effective time of approximately $2.3 billion, and (b) the DeepGreen Earnout Shares, (iii) DeepGreen will become a wholly-owned subsidiary of TMC; and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, Canada. In addition, the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with its terms.

In connection with the foregoing and substantially concurrent with the execution of the Business Combination Agreement, SOAC entered into Subscription Agreements with each of the PIPE Investors, pursuant to which the PIPE Investors have agreed to subscribe for and purchase, and SOAC has agreed to issue and sell to the PIPE

Investors, an aggregate of 33,030,000 shares, without par value, of TMC Common Shares at a price of $10.00 per share, for aggregate gross proceeds of $330,300,000, which we refer to as the "PIPE Financing." The TMC Common Shares to be issued pursuant to the Subscription Agreements have not been registered under the Securities Act in reliance upon the exemption provided in Section 4(a)(2) of the Securities Act. SOAC will grant the PIPE Investors certain registration rights in connection with the PIPE Financing. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination.

In connection with the Business Combination, certain related agreements have been, or will be entered into on or prior to the closing of the Business Combination, including the Subscription Agreements, the Transaction Support Agreements, the Sponsor Letter Agreement and the Amended and Restated Registration Rights Agreement (each as defined in the accompanying proxy statement/prospectus). See "*Business Combination Proposal — Related Agreements*" for more information.

Consideration to DeepGreen Equityholders in the Business Combination

In accordance with the terms and subject to the conditions of the Business Combination Agreement, pursuant to the Plan of Arrangement, the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares or DeepGreen Options, as applicable, the following shares or options to purchase the following shares: an aggregate of (i) 230,600,000 TMC Common Shares, assuming an Adjusted Equity Value immediately prior to the effective time of approximately $2.3 billion, and (ii) the DeepGreen Earnout Shares. The TMC Common Shares and DeepGreen Earnout Shares to be issued to Existing DeepGreen Securityholders pursuant to the Share Exchange and Amalgamation in connection with the Arrangement will not be registered under the Securities Act and will be issued pursuant to the exemption provided by Section 3(a)(10) under the Securities Act.

"Adjusted Equity Value" under the Business Combination Agreement means the sum of (a) the Equity Value of $2.25 billion plus (b) the Aggregate Company Option Exercise Price (the aggregate exercise price that would be paid to DeepGreen in respect of all DeepGreen Options (whether vested or unvested) if such DeepGreen Options were exercised in full immediately prior to the Effective Time), plus (c) Net Group Company Cash (as defined in the Business Combination Agreement) immediately prior to the closing of the Business Combination. We have assumed $10 million of Net Group Company Cash at closing of the Business Combination, which would result in an approximately $2.306 billion Adjusted Equity Value and the issuance of 230,600,000 TMC Common Shares to Existing DeepGreen Shareholders and holders of DeepGreen Options.

Aggregate New DeepGreen Proceeds

The Aggregate Transaction Proceeds will be used for general corporate purposes after the Business Combination.

Closing and Effective Time of the Business Combination

The Closing of the transactions contemplated by the Business Combination Agreement is required to take place electronically by exchange of the closing deliverables as promptly as reasonably practicable, but in no event later than the third business day, following the satisfaction (or, to the extent permitted by applicable law, waiver) of the conditions described below under the section entitled "*Business Combination Proposal — Conditions to Closing of the Business Combination*," (other than those conditions that by their nature are to be satisfied at the Closing, but subject to satisfaction or waiver of such conditions) or at such other place, date and/or time as SOAC and DeepGreen may agree in writing.

Conditions to Closing of the Business Combination

Conditions to Each Party's Obligations

The respective obligations of each party to the Business Combination Agreement to consummate the transactions contemplated by the Business Combination are subject to the satisfaction or, if permitted by applicable law, waiver by the party whose benefit such condition exists of the following conditions:

- the approval of the DeepGreen Arrangement Resolution by not less than two-thirds of each of (i) the DeepGreen Shareholders, and (ii) the DeepGreen Shareholders and the holders of DeepGreen

Options, voting together as a single class, in each case, present in person or by proxy at the DeepGreen Securityholders' Meeting in accordance with the Interim Order and applicable laws, and the delivery of a certified copy of such DeepGreen Arrangement Resolution to SOAC;

- the Final Order shall have been obtained on terms consistent with the Business Combination Agreement and shall not have been set aside or modified in a manner unacceptable to either SOAC or DeepGreen, each acting reasonably, on appeal or otherwise;
- no order or law issued by any court of competent jurisdiction or other governmental entity or other legal restraint or prohibition preventing the consummation of the transactions contemplated by Business Combination being in effect;
- this registration statement/proxy statement becoming effective in accordance with the provisions of the Securities Act, no stop order being issued by the SEC and remaining in effect with respect to this registration statement/proxy statement, and no proceeding seeking such a stop order being threatened or initiated by the SEC and remaining pending;
- the approval of each Condition Precedent Proposal by the affirmative vote of the holders of the requisite number of ordinary shares of SOAC being obtained in accordance with SOAC's Existing Governing Documents and applicable law;
- SOAC's initial listing application with NYSE in connection with the transactions contemplated by the Business Combination Agreement being approved and, immediately following the Effective Time, SOAC satisfying any applicable initial and continuing listing requirements of NYSE, and SOAC not having received any notice of non-compliance in connection therewith that has not been cured or would not be cured at or immediately following the Effective Time, and the TMC Common Shares (including the TMC Common Shares to be issued in connection with the transactions contemplated by the Business Combination Agreement), being approved for listing on NYSE; and
- after giving effect to the transactions contemplated by the Business Combination Agreement (including the PIPE Financing), SOAC having at least $5,000,001 of net tangible assets (as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act) immediately after the Effective Time of the Business Combination, which condition we expect to be satisfied at closing due to the PIPE Financing.

Other Conditions to the Obligations of the SOAC Parties

The obligations of the SOAC and NewCo Sub (collectively, the "SOAC Parties") to consummate the transactions contemplated by the Business Combination Agreement are subject to the satisfaction or, if permitted by applicable law, waiver by SOAC (on behalf of itself and the other SOAC Parties) of the following further conditions:

- the representations and warranties of DeepGreen regarding organization and qualification of DeepGreen and its subsidiaries, certain representations and warranties regarding the capitalization, payments to affiliates, and amounts payable upon a change in control, of DeepGreen and the representations and warranties of DeepGreen regarding the authority of DeepGreen to, among other things, consummate the transactions contemplated by the Business Combination Agreement, the intended tax treatment of the Share Exchange and Amalgamation and the Continuance and brokers fees being true and correct (without giving effect to any limitation of "materiality" or "DeepGreen Material Adverse Effect" (as defined below) or any similar limitation set forth in the Business Combination Agreement) in all material respects as of the Closing Date as if made at and as of such date (or, if given as of an earlier date, as of such earlier date);
- certain other representations and warranties regarding the capitalization of DeepGreen being true and correct in all respects (except for *de minimis* inaccuracies) as of the Closing Date (or, if given as of an earlier date, as of such earlier date);
- the other representations and warranties of DeepGreen being true and correct (without giving effect to any limitation as to "materiality" or "DeepGreen Material Adverse Effect" or any similar limitation set forth in the Business Combination Agreement) in all respects as of the Closing Date (or, if given as of an earlier date, as of such earlier date), except where the failure of such representations and warranties to be true and correct, taken as a whole, does not cause a DeepGreen Material Adverse Effect;

- DeepGreen having performed and complied in all material respects with the covenants and agreements required to be performed or complied with by it under the Business Combination Agreement prior to the Closing;
- since the date of the Business Combination Agreement, no DeepGreen Material Adverse Effect having occurred that is continuing;
- DeepGreen having consummated the Preferred Share Conversion and the Convertible Debenture Conversion; and
- at or prior to the Closing, SOAC must have received a certificate executed by an authorized officer of DeepGreen confirming that the conditions set forth in the first five bullet points in this section have been satisfied.

Other Conditions to the Obligations of DeepGreen

The obligations of DeepGreen to consummate the transactions contemplated by the Business Combination Agreement are subject to the satisfaction or, if permitted by applicable law, waiver by DeepGreen of the following further conditions:

- the representations and warranties regarding organization and qualification of the SOAC Parties, the authority of SOAC to execute and deliver the Business Combination Agreement, and each of the ancillary documents thereto to which it is or will be a party and to consummate the transactions contemplated thereby, certain representations and warranties regarding the capitalization of the SOAC Parties, the intended tax treatment of the Share Exchange and Amalgamation and Continuance and brokers fees being true and correct, in all material respects as of the Closing Date, as though made on and as of the Closing Date (or, if given as of an earlier date, as of such earlier date);
- certain other representations and warranties regarding the capitalization of SOAC being true and correct in all respects, (except for *de minimis* inaccuracies) as of the Closing Date (or, if given as of an earlier date, as of such earlier date);
- the other representations and warranties of the SOAC Parties being true and correct (without giving effect to any limitation of "materiality" or "SOAC Material Adverse Effect" (as defined below) or any similar limitation set forth in the Business Combination Agreement) in all respects as of the Closing Date, except where the failure of such representations and warranties to be true and correct, taken as a whole, does not cause a SOAC Material Adverse Effect;
- the SOAC Parties having performed and complied in all material respects with the covenants and agreements required to be performed or complied with by them under the Business Combination Agreement;
- the Aggregate Transaction Proceeds being equal to or greater than $250,000,000, which condition we expect to be satisfied at closing due to the PIPE Financing;
- since the date of the Business Combination Agreement, no SOAC Material Adverse Effect having occurred that is continuing;
- at or prior to the Closing, DeepGreen must have received the Amended and Restated Registration Rights Agreement duly executed by SOAC;
- at or prior to the Closing, DeepGreen must have received a certificate executed by an authorized officer of SOAC confirming that the conditions set forth in the first four bullet points of this section have been satisfied; and
- SOAC shall have taken all necessary or appropriate actions such that effective immediately after the Effective Time, the SOAC Board shall consist of the number of directors, and comprising the individuals, determined pursuant to Section 5.15 of the Business Combination Agreement.

Representations and Warranties

Under the Business Combination Agreement, DeepGreen made customary representations and warranties to SOAC relating to, among other things: organization and qualification; capitalization; authorization; financial statements, absence of undisclosed liabilities, consents and approvals; permits; material contracts; absence of certain changes; litigation; compliance with law; employee plans; environmental matters; intellectual property; labor matters; insurance; tax matters; brokers; real and personal property; transactions with affiliates; data privacy and security; compliance with international trade and anti-corruption laws; information supplied; regulatory compliance; and investigation.

Under the Business Combination Agreement, the SOAC Parties made customary representations and warranties to DeepGreen relating to, among other things: organization and qualification; authorization; consent and approvals; brokers; information supplied; capitalization; SEC Filings; the trust account; transactions with affiliates; litigation; compliance with law; business activities; internal controls and financial statements; absence of undisclosed liabilities; tax matters; investigation; SOAC expenses and liabilities; and investigation.

Material Adverse Effect

Under the Business Combination Agreement, certain representations and warranties of DeepGreen and SOAC are qualified in whole or in part by materiality thresholds. In addition, certain representations and warranties of DeepGreen and SOAC are qualified in whole or in part by a material adverse effect standard for purposes of determining whether a breach of such representations and warranties has occurred.

Pursuant to the Business Combination Agreement, a "DeepGreen Material Adverse Effect" means any change, event, effect or occurrence that, individually or in the aggregate with any other change, event, effect or occurrence, has had or would reasonably be expected to have a material adverse effect on (a) the business, results of operations, financial condition or assets of DeepGreen and its subsidiaries, taken as a whole, or (b) the ability of DeepGreen to consummate the transactions contemplated by the Business Combination Agreement, in each case, in accordance with the terms of the Business Combination Agreement; provided, however, that, in the case of clause (a), none of the following shall be taken into account in determining whether a DeepGreen Material Adverse Effect has occurred or is reasonably likely to occur: any adverse change, event, effect or occurrence arising after the date of the Business Combination Agreement from or related to (i) general business or economic conditions in or affecting the United States or Canada, or changes therein, or the global economy generally, (ii) any national or international political or social conditions in the United States, Canada or any other country, including the engagement by the United States, Canada or any other country in hostilities, whether or not pursuant to the declaration of a national emergency or war, or the occurrence in any place of any military or terrorist attack, sabotage or cyberterrorism, (iii) changes in conditions of the financial, banking, capital or securities markets generally in the United States, Canada or any other country or region in the world, or changes therein, including changes in interest rates in the United States, Canada or any other country and changes in exchange rates for the currencies of any countries, (iv) changes in any applicable laws, (v) any change, event, effect or occurrence that is generally applicable to the industries or markets in which DeepGreen or any of its subsidiaries operates, (vi) the execution or public announcement of the Business Combination Agreement or the pendency or consummation of the transactions contemplated by the Business Combination Agreement, including the impact thereof on the relationships, contractual or otherwise, of DeepGreen or any of its subsidiaries with employees, customers, investors, contractors, lenders, suppliers, vendors, partners, licensors, licensees, payors or other third parties related thereto (provided that the exception in this clause (vi) shall not apply to the representations and warranties set forth in Section 3.5(b) of the Business Combination Agreement to the extent that its purpose is to address the consequences resulting from the public announcement or pendency or consummation of the transactions contemplated by the Business Combination Agreement or the condition set forth in Section 6.2(a) of the Business Combination Agreement to the extent it relates to such representations and warranties), (vii) any failure by DeepGreen or any of its subsidiaries to meet, or changes to, any internal or published budgets, projections, forecasts, estimates or predictions (although the underlying facts and circumstances resulting in such failure may be taken into account to the extent not otherwise excluded from this definition pursuant to clauses (i) through (vi) or (viii)), or (viii) any hurricane, tornado, flood, earthquake, tsunami, natural disaster, mudslides, wild fires, epidemics, pandemics (including COVID-19) or quarantines, acts of God or other natural disasters or comparable events in the United States, Canada or any other country or region in the world, or any escalation of the foregoing; provided, however, that any change, event, effect or occurrence resulting from a matter described in any of the foregoing clauses (i) through (v) or clause (viii) may be taken into account

in determining whether a DeepGreen Material Adverse Effect has occurred or is reasonably likely to occur to the extent such change, event, effect or occurrence has or has had a disproportionate adverse effect on DeepGreen or any of its subsidiaries, taken as a whole, relative to other participants operating in the industries or markets in which DeepGreen or any of its subsidiaries operate.

Under the Business Combination Agreement, certain representations and warranties of the SOAC Parties are qualified in whole or in part by a material adverse effect standard for purposes of determining whether a breach of such representations and warranties has occurred. Pursuant to the Business Combination Agreement, a "SOAC Material Adverse Effect" means any change, event, effect or occurrence that, individually or in the aggregate with any other change, event, effect or occurrence, has had or would reasonably be expected to have a material adverse effect on (a) the business, results of operations or financial condition of the SOAC Parties, taken as a whole, or (b) the ability of any SOAC Party to consummate the transactions contemplated by the Business Combination Agreement, in each case, in accordance with the terms of the Business Combination Agreement; provided, however, that, in the case of clause (a), none of the following shall be taken into account in determining whether a SOAC Material Adverse Effect has occurred or is reasonably likely to occur: any adverse change, event, effect or occurrence arising after the date of the Business Combination Agreement from or related to (i) general business or economic conditions in or affecting the United States or Canada, or changes therein, or the global economy generally, (ii) any national or international political or social conditions in the United States, Canada or any other country, including the engagement by the United States, Canada or any other country in hostilities, whether or not pursuant to the declaration of a national emergency or war, or the occurrence in any place of any military or terrorist attack, sabotage or cyberterrorism, (iii) changes in conditions of the financial, banking, capital or securities markets generally in the United States, Canada or any other country or region in the world, or changes therein, including changes in interest rates in the United States, Canada or any other country and changes in exchange rates for the currencies of any countries, (iv) changes in any applicable laws, (v) any change, event, effect or occurrence that is generally applicable to the industries or markets in which the SOAC Parties operates, (vi) the execution or public announcement of the Business Combination Agreement or the pendency or consummation of the transactions contemplated by the Business Combination Agreement, including the impact thereof on the relationships, contractual or otherwise, of the SOAC Party with employees, customers, investors, contractors, lenders, suppliers, vendors, partners, licensors, licensees, payors or other third parties related thereto (provided that the exception in this clause (vi) shall not apply to the representations and warranties set forth in Section 4.3(b) of the Business Combination Agreement to the extent that its purpose is to address the consequences resulting from the public announcement or pendency or consummation of the transactions contemplated by the Business Combination Agreement or the condition set forth in Section 6.3(a) of the Business Combination Agreement to the extent it relates to such representations and warranties), (vii) any failure by the SOAC Parties to meet, or changes to, any internal or published budgets, projections, forecasts, estimates or predictions (although the underlying facts and circumstances resulting in such failure may be taken into account to the extent not otherwise excluded from this definition pursuant to clauses (i) through (vi) or (viii)), (viii) any hurricane, tornado, flood, earthquake, tsunami, natural disaster, mudslides, wild fires, epidemics, pandemics (including COVID-19) or quarantines, acts of God or other natural disasters or comparable events in the United States, Canada or any other country or region in the world, or any escalation of the foregoing, or (ix) the matters set forth on Section 1.1 of the SOAC disclosure schedules to the Business Combination Agreement; provided, however, that any change, event, effect or occurrence resulting from a matter described in any of the foregoing clauses (i) through (v) or (viii) may be taken into account in determining whether an SOAC Material Adverse Effect has occurred or is reasonably likely to occur to the extent such change, event, effect or occurrence has or has had a disproportionate adverse effect on the SOAC Parties, taken as a whole, relative to other participants operating in the industries or markets in which the SOAC Parties operate.

Covenants of the Parties

Covenants of DeepGreen

DeepGreen made certain covenants under the Business Combination Agreement, including, among others, the following:

- Subject to certain exceptions or as consented to in writing by SOAC (such consent not to be unreasonably withheld, conditioned or delayed), prior to the Closing, DeepGreen will and will cause its subsidiaries to, operate the business of DeepGreen and its subsidiaries in the ordinary course in all

material respects and use reasonable best efforts to maintain and preserve intact in all material respects the business organization, assets, properties and material business relations of DeepGreen and its subsidiaries.

- Subject to certain exceptions, prior to the Closing, DeepGreen will and will cause its subsidiaries to, not do any of the following without SOAC's consent (such consent not to be unreasonably withheld, conditioned or delayed except in the case of the first, second, sixth, seventh, eleventh, twelfth, fourteenth and fifteenth sub-bullets below):
- declare, set aside, make or pay any dividends or distribution or payment in respect of, or repurchase any outstanding, any equity securities of DeepGreen or any subsidiary;
- merge, consolidate, combine or amalgamate with any person or purchase or otherwise acquire any business entity or organization;
- adopt any amendments, supplements, restatements or modifications to any DeepGreen governing documents or equity plan;
- dispose or subject to a lien any equity interests of DeepGreen or its subsidiaries or issue any options or other rights obligating DeepGreen or any of its subsidiaries to issue any equity interests;
- incur, create or assume any indebtedness other than ordinary course trade payables;
- amend, modify or terminate certain material contracts related to, among other things, research, exploration, or development (subject to certain exceptions), waive any material benefit or right under such material contracts, or enter into any contract that would constitute the aforementioned material contracts;
- make any loans, advances or capital contributions to, or guarantees for the benefit of, or any investments in, any person, subject to certain exceptions;
- adopt or materially amend any material benefit plan or materially increase or decrease any salary, bonus, benefit, incentive or any other compensation payable to any current or former director, manager, officer, employee, individual, independent contractor or service provider or take any action to accelerate any payment or benefit payable to any such person;
- waive or release any noncompetition, non-solicitation, no-hire, nondisclosure, noninterference, nondisparagement or other restrictive covenant obligation of any current or former director, manager, officer, employee, individual independent contractor or other service provider;
- make an entity classification election for U.S. federal income tax purposes of DeepGreen or any of its subsidiaries, enter into any tax sharing or tax indemnification agreement (except solely between DeepGreen and its subsidiaries), or fail to pay any material taxes when due (including estimated taxes);
- enter into any settlements in excess of a certain threshold or that impose any material non-monetary obligations on DeepGreen or any of its subsidiaries;
- authorize, recommend, propose or announce an intention to adopt a plan of complete or partial liquidation, dissolution, restructuring, recapitalization, reorganization or similar transaction;
- make any material changes to the methods of accounting of DeepGreen or any of its subsidiaries, other changes that are made in accordance with Public Company Accounting Oversight Board standard;
- enter into any contract providing for the payment of any brokerage fee, finders' fee or other commission in connection with the transactions contemplated by the Business Combination Agreement or any ancillary documents thereto;
- make any change of control payment that is not disclosed to SOAC on the DeepGreen disclosure schedules; and
- enter into any contract to take or cause to be taken any of the foregoing actions.

- DeepGreen shall not (i) withdraw, amend, modify or, in a manner adverse to SOAC, qualify, or publicly propose or state an intention to withdraw, amend, modify or, in a manner adverse to SOAC, qualify, the recommendation that the DeepGreen Securityholders vote in favor of the Business Combination Agreement, the ancillary documents and the transactions contemplated thereby, (ii) accept, approve, endorse or recommend, or publicly propose to accept, approve, endorse or recommend any other acquisition proposal related to DeepGreen or its subsidiaries or any of its or their assets or take no position or remain neutral with respect to a publicly announced, or otherwise publicly disclosed, acquisition of such type for more than five business days (or beyond the third business day prior to the date of the DeepGreen Securityholders meeting), or (iii) approve, endorse, recommend or authorize DeepGreen to enter into a contract concerning a any other acquisition proposal related to DeepGreen or its subsidiaries or any of its or their assets.

- Prior to the Closing Date, DeepGreen must approach each DeepGreen shareholder that is likely to hold in excess of 1% of the outstanding DeepGreen shares immediately prior to the Effective Time, and request that such DeepGreen shareholder execute the Amended and Restated Registration Rights Agreement.

- Subject to certain exceptions, prior to the Closing, DeepGreen will purchase a "tail" policy providing liability insurance coverage for DeepGreen directors and officers with respect to matters occurring on or prior to the Closing.

Subject to certain exceptions, prior to the Closing or termination of the Business Combination Agreement in accordance with its terms, DeepGreen shall not, and shall cause its subsidiaries and its and their respective representatives not to: (i) knowingly solicit, initiate, encourage (including by means of furnishing or disclosing information), knowingly facilitate, discuss or negotiate, directly or indirectly, any inquiry, proposal or offer (written or oral) with respect to a DeepGreen Acquisition Proposal (as defined below); (ii) furnish or disclose any non-public information to any person in connection with, or that could reasonably be expected to lead to, a DeepGreen Acquisition Proposal; (iii) enter into any contract or other arrangement or understanding regarding a DeepGreen Acquisition Proposal; (iv) prepare or take any steps in connection with a public offering of any equity securities of DeepGreen or its subsidiaries (or any affiliate or successor of DeepGreen or its subsidiaries); or (v) otherwise cooperate in any way with, or assist or participate in, or knowingly facilitate or knowingly encourage any effort or attempt by any person to do or seek to do any of the foregoing.

For the purposes of the Business Combination Agreement, a "DeepGreen Acquisition Proposal" means (a) any direct or indirect acquisition, in one or a series of transactions, (i) of or with the DeepGreen or any of its controlled affiliates or (ii) of all or a material portion of assets, equity interests or businesses of DeepGreen or any of its controlled affiliates (in the case of each of clause (i) and (ii), whether by merger, amalgamation, consolidation, recapitalization, purchase or issuance of equity interests, offer or otherwise), or (b) any equity or similar investment in DeepGreen or any of its controlled affiliates. Notwithstanding the foregoing or anything to the contrary in the Business Combination Agreement, none of this Business Combination Agreement, the ancillary documents or the transactions contemplated thereby, including the Convertible Debentures Conversion, shall constitute a DeepGreen Acquisition Proposal.

Covenants of SOAC

SOAC made certain covenants under the Business Combination Agreement, including, among others, the following:

- Subject to certain exceptions (including the ability of any SOAC Party to use funds held by SOAC outside the trust account to pay any SOAC expenses or liabilities to distribute or pay over any funds held by SOAC outside the trust account to Sponsor or any of its affiliates, in each case, prior to the Closing) or as consented to in writing by DeepGreen, prior to the Closing, SOAC will, and will cause its subsidiaries to, not do any of the following:

- adopt any amendments, supplements, restatements or modifications to the SOAC trust agreement, warrant agreement or the governing documents of SOAC or any of its subsidiaries;

- declare, set aside, make or pay any dividends or distribution or payment in respect of, or repurchase any outstanding, any equity securities of SOAC or any subsidiary;

- split, combine, reclassify, subdivide or consolidate any of its equity securities or issue any other security in respect of, in lieu of or in substitution for its equity securities;
- incur, create or assume any indebtedness or guarantee any liability of any person (other than SOAC or any of its subsidiaries);
- make any loans or advances to, or capital contributions in, any other person, other than to, or in, SOAC or any of its subsidiaries;
- issue any equity securities of SOAC or any of its subsidiaries or grant any additional options, warrants or stock appreciation rights with respect to equity securities of the foregoing of SOAC or any of its subsidiaries;
- amend, modify or renew any SOAC related party transaction (subject to certain exceptions) or enter into any contract that if entered into prior to the execution of the Business Combination Agreement would constitute a SOAC related party transaction;
- engage in any activities or business, or incur any material liabilities, other than any activities, businesses or liabilities that are permitted under the Business Combination Agreement;
- authorize, recommend, propose or announce an intention to adopt a plan of complete or partial liquidation or dissolution;
- make, change or revoke any material tax election other than any such extension or waiver obtained in the ordinary course of business;
- enter into any contract providing for the payment of any brokerage fee, finders' fee or other commission in connection with the transactions contemplated by the Business Combination Agreement; and
- enter into any contract to take or cause to be taken any of the foregoing actions.
- As promptly as reasonably practicable following the effectiveness of this registration statement of which this proxy statement/prospectus forms a part, SOAC will duly give notice of and use its reasonable best efforts to duly convene and hold the extraordinary general meeting to approve the Condition Precedent Proposals.
- Subject to certain exceptions, SOAC shall use its reasonable best efforts to (i) cause the TMC Common Shares issuable in accordance with the Business Combination Agreement to be approved for listing on the NYSE and (ii) to satisfy any applicable initial and continuing listing requirements of NYSE (provided, however, that SOAC may elect to seek approval for listing such TMC Common Shares on NASDAQ instead of NYSE).
- Prior to the effectiveness of this registration statement of which this proxy statement/prospectus forms a part, the SOAC Board will approve and adopt the Incentive Equity Plan and with any changes or modifications thereto as DeepGreen and SOAC may mutually agree (such agreement not to be unreasonably withheld, conditioned or delayed by either DeepGreen or SOAC, as applicable), and SOAC will reserve a number of TMC Common Shares for grant thereunder equal to 11% of the number of TMC Common Shares outstanding following Closing.

Subject to certain exceptions, prior to the Closing or termination of the Business Combination Agreement in accordance with its terms, SOAC shall not and shall cause its representatives not to, directly or indirectly: (i) knowingly solicit, initiate, encourage (including by means of furnishing or disclosing information), knowingly facilitate, discuss or negotiate, directly or indirectly, any inquiry, proposal or offer (written or oral) with respect to an SOAC Acquisition Proposal (as defined below); (ii) furnish or disclose any non-public information to any person in connection with, or that could reasonably be expected to lead to, an SOAC Acquisition Proposal; (iii) enter into any contract or other arrangement or understanding regarding an SOAC Acquisition Proposal; or (iv) otherwise cooperate in any way with, or assist or participate in, or knowingly facilitate or knowingly encourage any effort or attempt by any person to do or seek to do any of the foregoing.

For the purposes of the Business Combination Agreement, an "SOAC Acquisition Proposal" means any direct or indirect acquisition (or other business combination), in one or a series of related transactions, by SOAC (a) of or with an unaffiliated entity or (b) of all or a material portion of the assets, equity interests or businesses of an unaffiliated entity (in the case of each of clause (a) and (b), whether by merger, consolidation, recapitalization,

purchase or issuance of equity interests, tender offer or otherwise). Notwithstanding the foregoing or anything to the contrary in the Business Combination Agreement, none of the Business Combination Agreement, the ancillary documents or the transactions contemplated thereby shall constitute an SOAC Acquisition Proposal.

Mutual Covenants of the Parties

The parties made certain covenants under the Business Combination Agreement, including, among others, the following:

- using reasonable best efforts to consummate the Business Combination;
- notifying the other party in writing promptly after learning of any shareholder demands or other shareholder proceedings relating to the Business Combination Agreement, any ancillary document or any matters relating thereto and reasonably cooperate with one another in connection therewith;
- keeping certain information confidential in accordance with the existing non-disclosure agreements;
- making relevant public announcements;
- using reasonable best efforts to cause the each of the Continuance and the Share Exchange and Amalgamation to constitute a transaction treated as a "reorganization" within the meaning of Section 368 of the Code or otherwise use commercially reasonable efforts to cause the Continuance and the Transactions to so qualify; and
- cooperating in connection with certain tax matters and filings.

In addition, SOAC and DeepGreen agreed that SOAC and DeepGreen will prepare and mutually agree upon and SOAC will file with the SEC, this registration statement/proxy statement on Form S-4 relating to the Business Combination.

Board of Directors

Following the Closing, it is expected that the TMC Board will consist of nine directors. Pursuant to the Business Combination Agreement, the TMC Board will consist of (i) one (1) individual designated by Sponsor prior to the mailing of this proxy statement to SOAC shareholders, (ii) five individuals designated by DeepGreen prior to the mailing of this proxy statement to SOAC shareholders (at least one (1) of which shall qualify as an "independent director" under the listing rules of NYSE) and including Mr. Gerard Barron, current Chairman and CEO of DeepGreen whom shall be designated Chairman of the TMC Board, and (iii) three independent directors to be designated by DeepGreen prior to the mailing of this proxy statement to SOAC shareholders to be filled immediately following the Effective Time in accordance with the Amended and Restated Registration Rights Agreement and the TMC Notice and Articles.

Survival of Representations, Warranties and Covenants

The representations, warranties, agreements and covenants in the Business Combination Agreement terminate at the Effective Time, except for the covenants and agreements relevant to the Closing, agreements or covenants which by their terms contemplate performance after the Effective Time, and the representations and warranties of DeepGreen and SOAC regarding investigation and exclusivity of representations and warranties.

Termination

The Business Combination Agreement may be terminated under certain customary and limited circumstances at any time prior to the Closing, including, among others, the following:

- by the mutual written consent of SOAC and DeepGreen;
- by SOAC, subject to certain exceptions, if any of the representations or warranties made by DeepGreen are not true and correct or if DeepGreen fails to perform any of its respective covenants or agreements under the Business Combination Agreement (including an obligation to consummate the Closing) such that certain conditions to the obligations of SOAC, as described in the section entitled "— *Conditions to*

Closing of the Business Combination" above could not be satisfied and the breach (or breaches) of such representations or warranties or failure (or failures) to perform such covenants or agreements is (or are) not cured or cannot be cured within the earlier of (i) thirty (30) days after written notice thereof, and (ii) October 4, 2021 (the "Termination Date");

- by DeepGreen, subject to certain exceptions, if any of the representations or warranties made by the SOAC Parties are not true and correct or if any SOAC Party fails to perform any of its covenants or agreements under the Business Combination Agreement (including an obligation to consummate the Closing) such that the condition to the obligations of DeepGreen, as described in the section entitled "*— Conditions to Closing of the Business Combination*" above could not be satisfied and the breach (or breaches) of such representations or warranties or failure (or failures) to perform such covenants or agreements is (or are) not cured or cannot be cured within the earlier of (i) thirty (30) days after written notice thereof, and (ii) the Termination Date;
- by either SOAC or DeepGreen, if the transactions contemplated by the Business Combination Agreement are not consummated on or prior to the Termination Date, unless the breach of any covenants or obligations under the Business Combination Agreement by the party seeking to terminate proximately caused the failure to consummate the transactions contemplated by the Business Combination Agreement;
- by either SOAC or DeepGreen,
- if any governmental entity shall have issued an order or taken any other action permanently enjoining, restraining or otherwise prohibiting the transactions contemplated by the Business Combination Agreement and such order or other action shall have become final and nonappealable;
- if the approval of the Condition Precedent Proposals are not obtained at the extraordinary general meeting (including any adjournment thereof); and
- by SOAC, if DeepGreen has not obtained approval of two-thirds of each of (i) the DeepGreen Shareholders, and (ii) the DeepGreen Shareholders and the holders of DeepGreen Options, voting together as a single class, in each case, present in person or by proxy at the DeepGreen Securityholders' Meeting in accordance with the Interim Order and applicable law.

If the Business Combination Agreement is validly terminated, none of the parties to the Business Combination Agreement will have any liability or any further obligation under the Business Combination Agreement other than customary confidentiality obligations, except in the case of a Willful Breach (as defined in the Business Combination Agreement) of any covenant or agreement under the Business Combination Agreement or Fraud (as defined in the Business Combination Agreement).

Expenses

The fees and expenses incurred in connection with the Business Combination Agreement and the ancillary documents thereto, and the transactions contemplated thereby, including the fees and disbursements of counsel, financial advisors and accountants, will be paid by the party incurring such fees or expenses; provided that, (i) if the Business Combination Agreement is terminated in accordance with its terms, DeepGreen shall pay, or cause to be paid, all unpaid DeepGreen expenses and SOAC shall pay, or cause to be paid, all unpaid SOAC expenses and (ii) if the Closing occurs, then TMC shall pay, or cause to be paid, all unpaid DeepGreen expenses and all unpaid TMC expenses.

Governing Law

The Business Combination Agreement is governed by and construed in accordance with the laws of the State of Delaware, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Delaware or any other jurisdiction) that would cause the application of the law of any jurisdiction other than the State of Delaware, except that (i) as a matter of corporate law, the Continuance of SOAC out of the Cayman Islands will be made in accordance with and pursuant to the Cayman Islands Companies Act (as Revised), and the Continuance of SOAC into the Province of British Columbia, Canada will be made in accordance with and pursuant to Division 8 of Part 9 of the Business Corporations Act (British Columbia) (the "BCBCA"), (ii) the laws of the Province of British Columbia, Canada apply to the Preferred Share Conversion, the DeepGreen Information Circular, the

DeepGreen Securityholders meeting and the Plan of Arrangement as those are matters of domestic corporate laws relating to DeepGreen, and (iii) the Convertible Debenture Conversion is governed by the laws of British Columbia in accordance with the terms of the debentures.

Amendments

The Business Combination Agreement may be amended or modified only by a written agreement executed and delivered by (i) SOAC and DeepGreen prior to the Closing and (ii) TMC and Sponsor after the Closing.

Ownership of TMC

As of the date of this proxy statement/prospectus, there are 37,500,000 ordinary shares of SOAC issued and outstanding, which includes an aggregate of 7,500,000 Class B ordinary shares. As of the date of this proxy statement/prospectus, there are outstanding 15,000,000 public warrants and 9,500,000 private placement warrants of SOAC that were issued in a private placement concurrently with the initial public offering. Therefore, as of the date of this proxy statement/prospectus (without giving effect to the Business Combination and assuming that none of SOAC's outstanding Class A ordinary shares are redeemed in connection with the Business Combination), SOAC's fully-diluted share capital would be 52,666,333 ordinary shares.

The following table illustrates ownership levels in TMC Common Shares immediately following the consummation of the Business Combination, assuming either no redemptions of the Class A ordinary shares or that all of the Class A ordinary shares are redeemed, and the following additional assumptions: (i) 230,600,000 TMC Common Shares are issued to the holders of DeepGreen Common Shares and the holders of the DeepGreen Options (assuming exercise of such options), which would be the number of TMC Common Shares issued to these holders if the Adjusted Equity Value immediately prior to the Effective Date was approximately $2.3 billion; (ii) 33,030,000 TMC Common Shares are issued in the PIPE Financing; (iii) no public warrants or private placement warrants to purchase TMC Common Shares that will be outstanding immediately following Closing are exercised; (iv) the Allseas Warrant exercisable for TMC Common Shares upon consummation of the Business Combination is not exercised and (vi) no TMC Special Shares are converted to TMC Common Shares. If the actual facts are different than these assumptions, the ownership percentages in TMC will be different.

	Share Ownership in TMC	
	No redemptions	Maximum redemptions[1]
	Percentage of Outstanding Shares	Percentage of Outstanding Shares
SOAC public shareholders	10.0%	0.0%
Our initial shareholders[2]	2.3%	2.5%
PIPE Investors	11.0%	12.2%
Existing DeepGreen Securityholders[3]	76.7%	85.3%

(1) Assumes that all of SOAC's outstanding public shares are redeemed in connection with the Business Combination, in which case, the Aggregate Transaction Proceeds Condition and the Net Tangible Assets Condition are expected to be satisfied through the closing of the PIPE Financing.

(2) Includes 6,759,000 TMC Common Shares that will be issued to the holders of the existing Class B ordinary shares as a result and upon the consummation of the Continuance, and excludes 741,000 TMC Common Shares that are expected to be exchanged for Sponsor Earnout Shares at the Effective Time. Also excludes the TMC Common Shares that are issuable upon conversion of the Sponsor Earnout Shares.

(3) Represents 230,600,000 TMC Common Shares to be issued in connection with the Arrangement and excludes the TMC Common Shares that are issuable upon conversion of the DeepGreen Earnout Shares.

Related Agreements

This section describes certain additional agreements entered into or to be entered into pursuant to the Business Combination Agreement, but does not purport to describe all of the terms thereof. The following summary is qualified in its entirety by reference to the complete text of each of the agreements. The form of Subscription Agreement, the Amended and Restated Registration Rights Agreement, the form of Transaction Support Agreement

and the form of Sponsor Letter Agreement are attached hereto as Annex E, Annex F, Annex G, and Annex H, respectively. You are urged to read such agreements in their entirety prior to voting on the proposals presented at the extraordinary general meeting.

PIPE Financing

Concurrently with the execution of the Business Combination Agreement, SOAC has entered into the Subscription Agreements with each of the PIPE Investors, pursuant to which the PIPE Investors have agreed to subscribe for and purchase, and SOAC has agreed to issue and sell to the PIPE Investors, an aggregate of 33,030,000 TMC Common Shares at a price of $10.00 per share, for aggregate gross proceeds of $330,300,000. The TMC Common Shares to be issued pursuant to the Subscription Agreements have not been registered under the Securities Act in reliance upon the exemption provided in Section 4(a)(2) of the Securities Act. SOAC will grant the PIPE Investors certain registration rights in connection with the PIPE Financing. The PIPE Financing is contingent upon, among other things, the closing of the Business Combination.

Amended and Restated Registration Rights Agreement

At the Closing, SOAC, the initial shareholders, and certain Existing DeepGreen Securityholders will enter into an Amended and Restated Registration Rights Agreement (the "Amended and Restated Registration Rights Agreement"), pursuant to which, among other things, the initial shareholders and the Existing DeepGreen Securityholders (a) will agree not to effect any sale or distribution of certain securities of TMC held by them during the lock-up periods described therein and (b) will be granted certain customary registration rights, including demand, piggy-back and shelf registration rights. Notably, certain shares held by the initial holders shall not be offered, sold, pledged or distributed for periods of six months or twelve months, as applicable, and certain shares held by the Existing DeepGreen Securityholders shall not be offered, sold, pledged or distributed for periods of six months or two years, as applicable, subject to the exceptions described in the Amended and Restated Registration Rights Agreement. The Amended and Restated Registration Rights Agreement also provides that TMC will pay certain expenses relating to such registrations and indemnify the registration rights holders against (or make contributions in respect of) certain liabilities.

Transaction Support Agreements

Concurrently with the execution of the Business Combination Agreement, certain DeepGreen Securityholders entered into shareholder support agreements (the "Transaction Support Agreements") pursuant to which each such holder agreed (i) to vote at any meeting of the DeepGreen Securityholders all of its securities held of record or thereafter acquired and entitled to vote in favor of the Business Combination and the ancillary documents thereto and the consummation of the Arrangement and the transactions contemplated thereby, (ii) irrevocably appoint SOAC or any individual designated by SOAC as such DeepGreen Securityholder's attorney-in-fact, with full power of substitution in favor of SOAC, to take all such actions and execute and deliver such documents, instruments or agreements as are necessary to consummate the transaction contemplated by the Business Combination Agreement, including acting as a proxy, to attend on behalf of such DeepGreen Securityholder, at any meeting of the DeepGreen Securityholders with respect to the Business Combination, (iii) be bound by certain other covenants and agreements related to the Business Combination, and (iv) not to transfer such securities outside certain limited circumstances.

Sponsor Letter Agreement

Pursuant to the Business Combination Agreement, Sponsor, Rick Gaenzle, Isaac Barchas and Justin Kelly and DeepGreen entered into the Sponsor Letter Agreement (the "Sponsor Letter Agreement"), pursuant to which (a) Sponsor and each of Rick Gaenzle, Isaac Barchas and Justin Kelly has agreed to, among other things, (i) vote in favor of the Business Combination Agreement and the transactions contemplated thereby, (ii) waive any adjustment to the conversion ratio set forth in the governing documents of SOAC or any other anti-dilution or similar protection with respect to the Class B ordinary shares (whether resulting from the transactions contemplated by the Subscription Agreements or otherwise), (iii) be bound by certain other covenants and agreements related to the Business Combination and (iv) be bound by certain transfer restrictions with respect to his, her or its shares in SOAC prior to the closing of the Business Combination and (b) Sponsor has agreed to exchange 741,000 of its TMC Common Shares upon the Continuance for the Sponsor Earnout Shares at the Effective Time, in each case, on the terms and subject to the conditions set forth in the Sponsor Letter Agreement.

Background to the Business Combination

SOAC is a blank check company incorporated on December 18, 2019 as a Cayman Islands exempted company limited by shares and formed for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses. In conducting a search for a business combination target, as described in greater detail below, SOAC utilized the global network and investing, industry and sector and transaction experience of Sponsor, SOAC's management and the SOAC Board. The terms of the Business Combination Agreement and the related ancillary documents are the result of extensive negotiations among SOAC, DeepGreen, and their respective representatives and advisors.

On December 31, 2019, prior to the closing of SOAC's initial public offering, SOAC issued 8,625,000 founder shares to Sponsor in exchange for a capital contribution of $25,000, and Sponsor subsequently transferred 30,000 founder shares to each of Messrs. Barchas, Gaenzle, and Kelly. On May 8, 2020, SOAC completed its initial public offering of 30,000,000 units at a price of $10.00 per unit generating gross proceeds of $300,000,000 before underwriting discounts and expenses. Each unit consisted of one Class A ordinary share and one-half of one public warrant. Each whole public warrant entitles the holder thereof to purchase one Class A ordinary share at an exercise price of $11.50 per share, subject to certain adjustments. Simultaneously with the closing of its initial public offering, SOAC completed the sale of 9,500,000 warrants at a price of $1.00 per warrant, or $9,500,000 million in the aggregate, in a private placement to Sponsor. Each whole warrant entitles the holder thereof to purchase one Class A ordinary share at an exercise price of $11.50 per share, subject to certain adjustments. On June 19, 2020, Sponsor forfeited 1,125,000 Class B ordinary shares to SOAC as a result of the expiration of the underwriter's overallotment option.

Prior to the consummation of SOAC's initial public offering, neither SOAC, nor any authorized person on its behalf, initiated any substantive discussions, formal or otherwise, with respect to a business combination involving SOAC.

Following the completion of its initial public offering, SOAC's officers and directors commenced an active search for potential business combination targets, leveraging its officers' and directors' and Sponsor's network of investment bankers, private equity firms, venture capital firms, law firms, and numerous other business relationships. The focus of this search was potential business combination targets in industries that benefit from strong Environmental, Social and Governance ("ESG") profiles such as manufacturing (including auto, building materials), chemicals, services (including waste, environmental, construction), logistics (including transportation, distribution), technology (hardware, software, devices), agriculture (including biofuels) and energy (with focus on renewable generation, utility services, energy efficiency/management), among others. Furthermore, these potential business combination targets consisted of businesses which SOAC's directors and officers believed, based on their experiences, could satisfy all (or a portion of) certain key criteria for a business combination target, including, among others: (a) has existing operating practices that promote and profit from environmental sustainability or would benefit from implementing environmentally sustainable commercial and operating practices; (b) has a defensible position within a target market as a result of a differentiated technology, distribution capabilities, customer service or other competitive advantages; (c) has highly recurring, stable cash flows and operating leverage and may benefit from optimizing or delivering the capital structure; (d) would benefit from the collective capabilities of SOAC's management and Sponsor to tangibly improve the operations and market position of the target; (e) is sourced through SOAC's extensive network; (f) has a professional management team whose interests are aligned with SOAC's shareholders; and (g) has the potential to grow both organically through market expansion or increased market share as well as through external acquisitions. During this search, representatives or advisors of SOAC initiated contact with or were contacted by various representatives and advisors of more than 300 companies with respect to a potential business combination. SOAC entered into non-disclosure agreements with over 90 of these potential business combination targets, including DeepGreen, for purposes of performing due diligence and further evaluating and analyzing these companies as potential business combination targets. SOAC engaged in varying levels of discussions, due diligence, evaluation, analysis and negotiations with the business combination targets with whom it entered into non-disclosure agreements with, based on, among other factors, interest from, and due diligence access granted by, such target, SOAC's representatives' and advisors' beliefs as to which targets could best satisfy SOAC's key criteria for a business combination target, the receptivity to, or preparedness of, such target with respect to a business combination and the terms on which such target was willing to consider a potential business combination. This due diligence, evaluation and analysis involved, among other things, due diligence with respect to, and evaluating and analyzing, each target's business, historical and projected future performance (as well as

other financial information and growth opportunities), the management team (as well as its ability to lead a public company), competitive positioning and operating practices that promote and profit from environmental sustainability and other ESG principles.

In the course of its search for potential business combination targets, SOAC submitted non-binding term sheets or proposals to six companies (including DeepGreen) that SOAC believed, based on, among other things, its and its advisors' preliminary due diligence and evaluation and analysis, were most suitable for a business combination. These potential business combination targets, other than DeepGreen, are referred to herein as "Company A", "Company B", "Company C", "Company D" and "Company E". Companies A, C, D and E elected to pursue other opportunities. SOAC ended its negotiations with Company B after SOAC determined that a business combination with Company B would not meet SOAC's targeted investment criteria.

Negotiations with DeepGreen

The following is a brief description of the background of the negotiations between SOAC and DeepGreen and summarizes the key meetings and events that led to the signing of the Business Combination Agreement. The following chronology does not purport to catalogue every conversation among the parties to the Business Combination Agreement or their representatives.

One of the targets that was introduced to SOAC during its search was DeepGreen. Following a discussion on or about December 18, 2020 with Nomura Securities International, Inc. ("Nomura"), DeepGreen's financial advisor, in which Nomura provided a slate of potential business combination targets to SOAC and Nomura highlighted DeepGreen as a potential target, SOAC informed Nomura that it wished to begin discussions regarding the business and strategic prospects of DeepGreen, as well as how a potential business combination involving SOAC and DeepGreen would be potentially structured and the potential benefits of such business combination. In order to further explore a potential business combination, it was determined that SOAC and DeepGreen should enter into a confidential disclosure agreement, and on December 23, 2020, SOAC and DeepGreen entered into a confidentiality agreement to facilitate SOAC's review of DeepGreen's confidential information. Following the execution of such confidentiality agreement, from December 23, 2020 to January 8, 2021, multiple teleconference and virtual meetings were held between SOAC, DeepGreen and Nomura to further discuss and explore the business and strategic prospects of DeepGreen, a potential business combination between SOAC and DeepGreen and the potential terms of such a potential business combination, including the structure of such a transaction. On January 9, 2021, DeepGreen provided SOAC with a draft letter of intent for a proposed transaction (the "Letter of Intent").

Between January 9, 2021 and January 26, 2021, representatives of SOAC and Kirkland & Ellis LLP ("K&E"), counsel to SOAC, on the one hand, and representatives of DeepGreen, and Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. ("Mintz"), counsel to DeepGreen, on the other hand, exchanged multiple revised drafts of the Letter of Intent. Over the same period of time, the representatives and advisors for SOAC and DeepGreen held numerous conference calls regarding the revised drafts of the Letter of Intent and came to agreement on the outstanding business issues, including, among others:

- the scope of DeepGreen's assets to be included in the contemplated business combination with SOAC (which the parties agreed on January 13, 2021 would consist of all of DeepGreen and its assets rather than a subset of DeepGreen's assets as initially proposed by DeepGreen);
- the pre-transaction equity value ascribed to DeepGreen (which the parties agreed on January 23, 2021 would be a fixed pre-transaction equity value of $2.25 billion with no adjustments, which was determined by agreeing upon a multiple of DeepGreen's projected EBITDA in 2027, rather than the $2.0 billion pre-transaction equity value initially proposed by SOAC, subject to confirmatory due diligence and appropriate representations, warranties and covenants (and related closing bring-down standards) to provide additional comfort that there are not significant change of control payments or other stockholder "leakage" related to the transaction), which SOAC and DeepGreen management believed to be an attractive valuation in light of the inclusion of additional assets in the Business Combination as described above and of its evaluation and analysis of DeepGreen to date, including a comparable company analysis using a discounted multiples based approach (See the section entitled "— *Summary of SOAC Financial Analysis — Comparable Company Analysis.*");

- the key closing conditions (including the amount and components of the minimum proceeds condition, as well as whether this would be an one-way or two-way condition);
- the adjustment of a portion of the Sponsor's Class B ordinary shares to vest only upon satisfaction of certain share trigger price vesting conditions upon the closing of the Business Combination, and the number of such Class B ordinary shares to be subject to such conditions and the appropriate share trigger prices;
- the issuance of the Sponsor Earnout Shares to the Sponsor in connection with and in exchange for the adjustment to the Sponsor's Class B ordinary shares referenced above and the terms of the Sponsor Earnout Shares and the DeepGreen Earnout Shares;
- the lock-up period and conditions attached to the TMC Common Shares issued to DeepGreen Securityholders and the Sponsor upon closing of the Business Combination; and
- the composition of the TMC Board (which the parties agreed on January 23, 2021 would consist of nine directors, which would include five individuals to be designated by DeepGreen, one of whom would be DeepGreen's chief executive officer and at least one of whom must be an "independent" director, three individuals to be designated by DeepGreen, all of whom must be "independent" directors, and one individual to be designated by Sponsor, who must be an "independent" director).

In December 2020 and January 2021, SOAC management updated each member of the SOAC Board individually to inform them that discussions were being held with DeepGreen and its advisors regarding a potential business combination, and each member of the SOAC Board requested and received additional information about DeepGreen, its business and the potential business combination with DeepGreen.

On January 6, 2021, DeepGreen provided SOAC with access to an online data room for the purposes of conducting business, financial, legal, tax and other due diligence with respect to DeepGreen and its business. During the negotiation period of the Letter of Intent, SOAC and its representatives and advisors continued to conduct preliminary business and financial due diligence with respect to DeepGreen and its business and researched DeepGreen's markets and outlook in connection with exploring a potential business combination.

On January 13, 2021, each member of the SOAC Board was provided with an update on DeepGreen and other potential business combination opportunities. During the weeks of January 18, 2021 and January 25, 2021, SOAC management met individually with the members of the SOAC Board to update them on the status of discussions with DeepGreen and to inform them that drafts of the Letter of Intent had been exchanged with DeepGreen and the Letter of Intent was expected to be signed the week of January 25, 2021.

On January 26, 2021, after extensive negotiations between representatives and advisors of the parties, SOAC and DeepGreen agreed on, and executed, a non-binding (except for the exclusivity provisions described below) Letter of Intent, which provided for, among other things, a fixed pre-transaction equity value of $2.25 billion (with no adjustments) for DeepGreen and a binding exclusivity period that would end on the later of (a) 5:00 p.m. Eastern Time on February 26, 2021 and (b) the time at which either party gave written notice to the other party of termination thereof. On January 28, 2021 and January 29, 2021, representatives of SOAC and DeepGreen, as well as representatives of Nomura, held in-person meetings in Dubai, United Arab Emirates, during which the representatives thoroughly discussed process and timeline for key work streams, detailed business and financial due diligence matters and DeepGreen's business model and its future opportunities and strategy. In connection with the execution of the Letter of Intent that contained a binding exclusivity period, SOAC abandoned the other potential business combination opportunities that it had been analyzing and exploring because of, among other things, in addition to the reasons stated above for abandoning negotiations with Company A, Company B, Company C, Company D and Company E: (a) the business combination target pursued an alternative transaction or strategy; (b) the business combination target did not meet the valuation expectations or other key criteria of SOAC in a target; (c) SOAC management's belief that DeepGreen was the most attractive potential business combination that met its key criteria in a target; (d) the level of engagement by, and advanced negotiations and discussions with, DeepGreen, as compared to the other potential business combination targets; and (e) DeepGreen's preparedness and willingness to devote appropriate resources to negotiating and executing definitive agreements and to consummating a business combination and becoming a public company, as compared to the other potential business combination targets.

On January 29, 2021, representatives of K&E and Mintz held a teleconference to discuss the key legal work streams and the process and timeline related to these work streams.

On February 1, 2021, representatives of SOAC, representatives of DeepGreen, and advisors of each of SOAC and DeepGreen (including K&E, Mintz, Citigroup Global Markets Inc. ("Citi"), SOAC's financial advisor, Nomura and Fearnley Securities Inc. and Fearnley Securities AS (together, "Fearnley", and collectively with Citi and Nomura, the "Placement Agents") as the private placement agents to SOAC in connection with the PIPE) conducted a virtual meeting during which the parties and their representatives and advisors discussed the timeline and steps to signing a definitive written agreement providing for a potential business combination, and discussed and tentatively agreed to a work plan ultimately leading to the signing of definitive transaction agreements. Between the date of the initial virtual meeting on February 1, 2021 and March 3, 2021, representatives of SOAC, representatives of DeepGreen and advisors of each of SOAC and DeepGreen conducted regular virtual meetings to further refine the transaction timeline and steps and related work plan and to discuss progress on, and provide updates with respect to, key work streams and other aspects of the potential business combination. In connection with the consummation of the Business Combination, (i) Citi will be entitled to deferred underwriting compensation, as set forth in the registration statement for SOAC's initial public offering, (ii) Citi, Nomura and Fearnley will be entitled to customary fees in connection with the PIPE Financing and (iii) Citi and Nomura will be entitled to customary fees in connection with the Business Combination. These fees will be paid at the closing of the Business Combination, and are conditioned upon the successful completion of the Business Combination; if the Business Combination does not close, Citi, Nomura and Fearnley will not be entitled to such fees.

Between February 2, 2021 and February 8, 2021, multiple teleconference meetings were held between K&E, Mintz, Stikeman Elliott LLP ("Stikeman"), Canadian counsel to SOAC, and Fasken Martineau DuMoulin LLP ("Fasken"), Canadian counsel to DeepGreen, to discuss the structuring of the Business Combination, and the relative advantages and disadvantages of the various structures that were being considered, with it ultimately being agreed that the Business Combination would be effected by way of the Plan of Arrangement in order to attempt to minimize the tax consequences of the Business Combination to the existing tax-favorable outcomes for existing DeepGreen shareholders.

Between January 27, 2021 and March 3, 2021, representatives of SOAC conducted further business financial, legal, environmental and accounting due diligence with respect to DeepGreen and its business, in each case, based on information available in the online data room, written responses from the management team of DeepGreen and due diligence calls with management and advisors of DeepGreen.

Between January 27, 2021 and February 24, 2021, representatives of DeepGreen's tax advisor, Pricewaterhouse Coopers LLP, K&E, Stikeman, Mintz and Fasken held multiple meetings and discussions to determine the structure of the proposed Business Combination, including the structuring of the DeepGreen Earnout Shares and Sponsor Earnout Shares.

On February 19, 2021, K&E provided the initial draft of the Business Combination Agreement to Mintz. During the week of February 22, 2021, SOAC management met with each member of the SOAC Board in one-on-one virtual meetings to provide updates on the status of the potential business combination.

Between February 19, 2021 and March 3, 2021, K&E, on the one hand, and Mintz, on the other hand, exchanged numerous revised drafts of the Business Combination Agreement. Over the same period of time, K&E and Mintz and other representatives and advisors for SOAC and DeepGreen held numerous conference calls regarding certain terms and conditions of the Business Combination Agreement, including, among other things: (a) whether the equity value of $2.25 billion ascribed to DeepGreen would be subject to an upward adjustment for any excess cash over indebtedness; (b) the treatment of vested and unvested DeepGreen options and certain other outstanding DeepGreen equity securities and whether all or some of such equity securities would be included within or outside of the fixed pre-transaction equity value of $2.25 billion (i.e., whether such securities would reduce or not reduce the aggregate number of TMC Common Shares issuable to DeepGreen Securityholders); (c) terms to be included in the SOAC Articles regarding the TMC Special Shares, including with respect to transferability and automatic conversion of such TMC Special Shares, and requirements to change such terms in the SOAC Articles; (d) covenants, agreements and obligations of DeepGreen with respect to the Registration Rights Agreements, including, among other things, the required efforts by DeepGreen to obtain executed Registration Rights Agreements from certain shareholders of DeepGreen; (e) the allocation to the Sponsor of certain expenses and liabilities of SOAC in excess of $50 million; (f) the establishment and terms of the Incentive Equity Plan; (g) whether SOAC

would be listed on the NYSE or NASDAQ; and (h) the overall suite of representations, warranties and covenants to be provided by each party under the Business Combination Agreement and the related ancillary documents. For further information related to the final resolution of items (a) through (h), please see the section entitled "*Business Combination Proposal — The Business Combination Agreement*".

Between February 22, 2021 and February 26, 2021, SOAC management held one-on-one virtual and in person meetings with each member of the SOAC Board, during which SOAC management discussed the Business Combination, the status of the various work streams and the timeline to completing the Business Combination with each member of the SOAC Board.

Between February 24, 2021 and March 3, 2021, representatives of K&E and Mintz exchanged multiple drafts of the Transaction Support Agreements, the Registration Rights Agreement and the Sponsor Letter Agreement, each of which was executed on March 4, 2021, concurrently with the execution of the Business Combination Agreement. For further information related to these agreements, please see the section entitled "*Business Combination Proposal — Related Agreements*".

Between February 8, 2021 and March 3, 2021, representatives of SOAC, representatives of DeepGreen, and advisors of SOAC and DeepGreen exchanged numerous revised drafts of, and held various calls and meetings to discuss, the investor management presentation to be provided to potential investors in the PIPE Financing, including the use of proceeds to be included therein, research analyst coverage and outstanding information requests related thereto. Beginning in early February 2021, representatives of the Placement Agents held conversations with potential investors with respect to the PIPE Financing. SOAC and DeepGreen came to agreement on the proposed size and terms of the PIPE Financing and K&E, Mintz and Mayer Brown LLP, counsel to the Placement Agents, exchanged drafts of the form of Subscription Agreement to be used in the PIPE Financing. On February 11, 2021, a draft of the form of Subscription Agreement was distributed to potential PIPE Investors with respect to the PIPE Financing. Between February 11, 2021 and February 28, 2021, K&E and Mintz collectively negotiated the terms and exchanged drafts of the Subscription Agreements with the potential PIPE Investors and their respective representatives and advisors, including with respect to the funding mechanics, representations and warranties, registration rights and indemnification provisions set forth therein, and responded to follow-up questions and comments related thereto, particularly with respect to the Closing process and the expected timeline for consummating the Business Combination. During this time, the potential PIPE Investors conveyed to the Placement Agents their initial proposed subscription amounts. On February 28, 2021, a final version of the form of Subscription Agreement for institutional investors and a secondary form of Subscription Agreement for accredited investors were distributed to the potential PIPE Investors, which reflected the outcome of negotiations between SOAC, DeepGreen, and the potential PIPE Investors and their respective representatives and advisors. On March 4, 2021, the potential PIPE Investors that had chosen to participate in the PIPE Financing indicated their final subscription amounts and delivered executed Subscription Agreements to K&E.

On March 2, 2021, a virtual meeting of the SOAC Board was held with representatives of Citi, K&E, Stikeman, Maples Group ("Maples"), counsel to SOAC with respect to matters of Cayman Islands law, and SOAC's management in attendance. At the meeting, members of SOAC and representatives of Citi provided an overview of their evaluation and analysis of the potential business combination with DeepGreen, including an update with respect to the PIPE Financing process. The SOAC Board was also provided with an overview of the proposed Business Combination (including the potential benefits and the risks related thereto), the valuation of the combined company as implied by the terms of the potential business combination, including the PIPE Financing, the key terms of the related ancillary documents and the due diligence process and findings with respect to DeepGreen (including a brief summary of the key findings from the due diligence review conducted by representatives and advisors of SOAC), and an overview of directors' fiduciary duties in connection with the potential business combination. In addition, members of the SOAC Board disclosed and acknowledged that the Sponsor and certain officers and directors of SOAC have interests in the Business Combination that are different from or in addition to (and which conflict with) those of other shareholders of SOAC, as cited in "*Business Combination Proposal — Interests of SOAC's Directors and Executive Directors in the Business Combination*."

On March 3, 2021, a virtual meeting of the SOAC Board was held with representatives of Citi, K&E, Stikeman, Maples, and SOAC's management in attendance. At the meeting, based on the factors cited in "— *The SOAC Board's Reasons for the Business Combination*" and in light of the fact that the implied fair market value of the vested equity of DeepGreen to be acquired in the Business Combination was significantly in excess of

80% of the assets held in the Trust Account (excluding the deferred underwriting commissions and taxes payable on the income earned on the Trust Account), the SOAC Board then unanimously adopted and approved, among others, resolutions (a) determining that it is in the best interests of SOAC and its shareholders to adopt and approve the execution and delivery of the Business Combination Agreement and the ancillary documents thereto and the transactions contemplated by each of the Business Combination Agreement and the ancillary documents thereto (including the SOAC Continuance, the Share Exchange and Amalgamation and the PIPE Financing); (b) adopting and approving the Business Combination Agreement and ancillary documents thereto and approving SOAC's execution, delivery and performance of the same and the consummation of the transactions contemplated by the Business Combination Agreement and the ancillary documents thereto, including the SOAC Continuance, the Share Exchange and Amalgamation and the PIPE Financing; (c) recommending that the SOAC shareholders vote in favor of the Business Combination Proposal, the SOAC Continuance Proposal, each of the Governing Documents Proposals, the NYSE Proposal, the Incentive Award Plan Proposal, and the Adjournment Proposal; and (d) adopting and approving, conditioned upon the Closing and the receipt of the required SOAC shareholders vote in favor of the Incentive Award Plan Proposal, the Incentive Equity Plan and that the applicable number of shares of TMC Common Shares as set forth in the Business Combination Agreement be reserved for issuance under the TMC Incentive Equity Plan. The SOAC Board did not obtain a third-party valuation or fairness opinion in connection with its resolution to approve the Business Combination but determined that SOAC's directors and officers and the other representatives of SOAC had substantial experience in evaluating the operating and financial merits of companies similar to DeepGreen and reviewed certain financial information of DeepGreen and compared it to certain publicly traded companies, selected based on the experience and the professional judgement of SOAC's directors and officers, and concluded that the experience and background of SOAC's directors and officers, the members of the SOAC Board and the other representatives of SOAC enabled the SOAC Board to make the necessary analyses and determinations regarding the Business Combination.

On March 3, 2021 (Eastern Time), a virtual meeting of the DeepGreen board of directors was held, with members of DeepGreen management and representatives of Mintz, Fasken and Nomura present. The key agenda item for this meeting was to consider and discuss and, if the DeepGreen board of directors saw fit, approve the proposed business combination with SOAC together with related matters. Following a thorough review and discussion, the DeepGreen board of directors unanimously (a) determined that it is in the best interests of DeepGreen and fair to the DeepGreen Securityholders, to enter into the Business Combination Agreement, the ancillary documents to which DeepGreen is or will be a party and the transactions contemplated thereby (including the Business Combination), (b) approved the Plan of Arrangement, the Business Combination Agreement, the ancillary documents to which DeepGreen is or will be a party and the transactions contemplated thereby (including the Business Combination) and (c) recommended, among other things, the approval of the DeepGreen Arrangement Resolution, the Business Combination Agreement, the ancillary documents to which DeepGreen is or will be a party and the transactions contemplated thereby (including the Business Combination) by the DeepGreen Securityholders entitled to vote thereon.

On March 4, 2021, the parties entered into the Business Combination Agreement and the related ancillary documents and the PIPE Investors executed and delivered the Subscription Agreements, which provided for binding subscriptions to purchase an aggregate of approximately 33 million shares of TMC Common Shares at $10.00 per share.

On March 4, 2021, SOAC and DeepGreen issued a joint press release announcing the execution and delivery of the Business Combination Agreement, and SOAC filed a Current Report on Form 8-K, which filed as an exhibit (a) the Business Combination Agreement, (b) an investor presentation providing information on DeepGreen and a summary of certain key terms of the Business Combination, (c) the Sponsor Letter Agreement, (d) the form of Subscription Agreement, (e) the form of Individual Subscription Agreement, (f) the form of Transaction Support Agreement and (g) the joint press release, dated March 4, 2021.

On April 8, 2021, SOAC and DeepGreen entered into a consent agreement that provided for, among other things an amendment to the Option Plan, the Form of TMC Incentive Equity Plan, the Form SOAC Articles and the Form Plan of Arrangement, attached as exhibits to the Business Combination Agreement.

The SOAC Board's Reasons for the Business Combination

SOAC was formed for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses or entities. The SOAC Board sought to do this by utilizing the networks and industry experience of both the Sponsor and the SOAC Board and management to identify, acquire and operate one or more businesses. The members of the SOAC Board and management have extensive transactional experience.

As described under "*Background to the Business Combination*" above, the SOAC Board, in evaluating the Business Combination, consulted with SOAC's management and legal advisors. In reaching its unanimous decision to approve the Business Combination Agreement and the transactions contemplated by the Business Combination Agreement, the SOAC Board considered a range of factors, including, but not limited to, the factors discussed below. In light of the number and wide variety of factors considered in connection with its evaluation of the proposed combination, the SOAC Board did not consider it practicable to, and did not attempt to, quantify or otherwise assign relative weights to the specific factors that it considered in reaching its determination and supporting its decision. The SOAC Board contemplated its decision as in the context of all of the information available and the factors presented to and considered by it. In addition, individual directors may have given different weight to different factors. This explanation of SOAC's reasons for approving the combination and all other information presented in this section is forward-looking in nature and, therefore, should be read in light of the factors discussed under the section titled "*Cautionary Note Regarding Forward-Looking Statements.*"

In approving the combination, the SOAC Board decided not to obtain a fairness opinion. The officers and directors of SOAC have substantial experience in evaluating the operating and financial merits of companies from a wide range of industries and concluded that their experience and background, together with the experience of their representatives, enabled them to make the necessary analyses and determinations regarding the Business Combination.

The SOAC Board considered a number of factors pertaining to the Business Combination as generally supporting its decision to enter into the Business Combination Agreement and the transactions contemplated thereby, including, but not limited to, the following: SOAC's strategic focus on and demonstrable contributions toward global sustainability and environmental sustainability practices, the experience of the management team, and the ability to improve the economics of the business over time, and more generally the large market opportunity across electric vehicles and the opportunity to fill an expected supply chain gap in electric vehicle battery metals. The SOAC Board and management team alike were impressed with the DeepGreen team during the diligence process and in their own investigation of the broader electric vehicle industry. More specifically, the SOAC Board took into consideration the following factors or made the following determinations, as applicable:

- ***Meets the acquisition criteria that SOAC had established to evaluate prospective business combination targets.*** The SOAC Board determined that DeepGreen satisfies a number of the criteria and guidelines that SOAC established at its initial public offering, including its existing operating practices that promote and profit from environmental sustainability, its positive impact on the global carbon challenge, active participation in the global transition to a sustainable transportation model, its revenue and cash flow growth potential, its exposure to large addressable markets with long-term tailwinds, its organic growth potential and its experienced management team.

- ***Access to clean and inexpensive source of battery materials***. DeepGreen is well-positioned to address the battery metal shortage expected as a result of pending worldwide electrification. By sourcing battery metals from a vast resource of polymetallic nodules, DeepGreen expects to be able to reduce the lifecycle environmental impacts of electric vehicle metals while producing them at a low cost. The SOAC Board believes that DeepGreen's innovative approach to the collection of electric vehicle metals will make DeepGreen well positioned to become a leader in the provision of battery materials in the electric vehicle supply chain.

- ***Established strategic partnerships.*** DeepGreen has established strategic partnerships that position it well for development of its assets, including partners that are developing commercial nodule collections systems and processing flowsheets with zero solid waste. DeepGreen's exploration contracts and rights governed by the International Seabed Authority are also sponsored by state governments.

- ***Unique exposure to attractive tailwinds in a growing electric vehicle market***. The SOAC Board considered that the electric vehicle industry is at an inflection point in its growth, as demand for clean, quiet, and dependable transportation solutions has accelerated due to increasing cost competitiveness of electric vehicle solutions relative to conventional internal combustion engine vehicles, increased focus on climate change and associated government mandates for procuring clean energy and transportation, as well as increased consumer demand for these types of solutions. Such tailwinds position DeepGreen well for significant strategic and financial growth.

- ***Attractive enterprise valuation.*** The combined company will have an anticipated initial enterprise value of approximately $2.3 billion, implying an approximately 65% discount to the estimated value of the NORI-D project based on the Preliminary Economic Assessment for the NORI-D project, and not taking into account the value of any other assets or rights of DeepGreen. The SOAC Board also reviewed and considered valuations and trading of publicly traded companies in similar and adjacent sectors. Based on these metrics, the SOAC Board believed that this was an attractive valuation compared to other similar public companies. For additional information, see "*Business Combination Proposal — Summary of SOAC Financial Analysis*".

- ***Experienced management team***. The SOAC Board determined that DeepGreen has a proven and experienced team that is positioned to successively lead TMC after the Business Combination.

- ***Strong commitment of existing DeepGreen Securityholders***. Over 72% of the holders of the currently outstanding DeepGreen Common Shares and DeepGreen Options (collectively) have entered into Transaction Support Agreements demonstrating the strong support of DeepGreen Securityholders of the Business Combination.

- ***TMC's post-closing financial condition***. The SOAC Board also considered factors such as TMC's pro forma outlook, financial plan and debt structure, taking into consideration the fact that, after consummation of the Business Combination, TMC will have approximately $570 million (assuming no redemptions) of cash on its balance sheet, positioning it well to be fully funded to initial commercial production.

- ***Due diligence***. The SOAC Board reviewed and discussed in detail the results of the due diligence examination of DeepGreen conducted by SOAC's management team and SOAC's financial, accounting, environmental and legal advisors, which included a substantial number of virtual meetings with the management team and advisors of SOAC regarding SOAC's business and business plan, operations, prospects and forecasts, valuation analyses with respect to the Business Combination and other material matters, as well general financial, legal and accounting due diligence.

- ***DeepGreen shareholder lock-up.*** Shareholders of DeepGreen have agreed to be subject to a six-month lock-up period in respect of their TMC Common Shares received in the Business Combination (subject to a potential share price trigger release and certain other customary exceptions).

- ***Valuation supported by financial analysis and due diligence***. The SOAC Board determined that the valuation analysis conducted by SOAC's management team, based on the trading levels of comparable companies and the materials and financial projections provided by DeepGreen, supported the equity valuation of DeepGreen. As part of this determination, SOAC's management, Board and legal counsel conducted due diligence examinations of DeepGreen and discussed with DeepGreen's management the financial, technical, manufacturing and legal outlook of DeepGreen.

The SOAC Board also considered a variety of uncertainties, risks and other potentially negative factors relating to the Business Combination including, but not limited to, the following: redemptions, complexities related to the shareholder vote, litigation and threats of litigation and broader macro risks, including the time and capital required to reach initial commercial production and the ongoing development of the regulatory regime. Specifically, the SOAC Board considered the following issues and risks:

- ***Risk that the benefits described above may not be achieved***. The risk that the potential benefits of the Business Combination may not be fully achieved, or may not be achieved within the expected timeframe.

- ***Risk of the liquidation of SOAC***. The risks and costs to SOAC if the Business Combination is not completed, including the risk of diverting management's focus and resources from other business combination opportunities, which could result in SOAC being unable to effect a business combination in the requisite time frame and force SOAC to liquidate.

- ***Exclusivity***. The fact that the Business Combination Agreement includes an exclusivity provision that prohibits SOAC from soliciting other business combination proposals, which restricts SOAC's ability, so long as the Business Combination Agreement is in effect, to consider other potential business combinations.

- ***Risks regarding the shareholder vote***. The risk that SOAC's shareholders may fail to provide the votes necessary to effect the Business Combination.

- ***Limitations of review***. The SOAC Board did not obtain an opinion from any independent investment banking or accounting firm that the consideration to be exchanged is fair to SOAC or its shareholders from a financial point of view. Accordingly, the SOAC Board considered that SOAC might not have properly valued DeepGreen.

- ***SOAC shareholders receiving a minority position in TMC.*** The fact that current SOAC shareholders will hold a minority position in TMC, which will limit or preclude the ability of SOAC's current shareholders to influence corporate matters, including any future potential change in control or other material transaction.

- ***Closing conditions.*** The fact that completion of the Business Combination is conditioned on the satisfaction of certain closing conditions that are not within DeepGreen's control, including approval by DeepGreen Securityholders, approval by the Court of the Plan of Arrangement and approval by NASDAQ of the initial listing application in connection with the Business Combination.

- ***Potential Litigation***. The possibility of litigation challenging the Business Combination or that an adverse judgment granting permanent injunctive relief could indefinitely enjoin consummation of the Business Combination.

- ***Fees and expenses.*** The fees and expenses associated with completing the Business Combination.

- ***Other risk factors***. Various other risk factors associated with the respective businesses of SOAC and DeepGreen.

In addition to considering the factors described above, the SOAC Board also considered that some officers and directors of SOAC might have interests in the Business Combination as individuals that are in addition to, and that may be different from, the interests of SOAC's shareholders. The SOAC Board reviewed and considered these interests during the negotiation of the Business Combination and in evaluating and unanimously approving, as members of the SOAC Board, the Business Combination Agreement and the transactions contemplated thereby, including the Business Combination.

The SOAC Board concluded that the potential benefits that it expected SOAC and its shareholders to achieve as a result of the Business Combination outweighed the potentially negative factors associated with the Business Combination. Accordingly, the SOAC Board unanimously resolved (a) that it was in the best interests of SOAC and its shareholders to adopt and approve the execution and delivery of the Business Combination Agreement and the ancillary documents thereto and the transactions contemplated by each of the Business Combination Agreement and the ancillary documents thereto (including the SOAC Continuance, the Share Exchange and Amalgamation and the PIPE Financing); (b) to adopt and approve the Business Combination Agreement and ancillary documents thereto and approving SOAC's execution, delivery and performance of the same and the consummation of the transactions contemplated by the Business Combination Agreement and the ancillary documents thereto, including the SOAC Continuance, the Share Exchange and Amalgamation and the PIPE Financing; (c) to recommend that the SOAC shareholders vote in favor of the Business Combination Proposal, the SOAC Continuance Proposal, each of the Governing Documents Proposals, the NASDAQ Proposal, the Incentive Award Plan Proposal, and the Adjournment Proposal; and (d) to adopt and approve, conditioned upon the Closing and the receipt of the required

SOAC shareholders vote in favor of the Incentive Award Plan Proposal, the TMC Incentive Equity Plan and that the applicable number of shares of TMC Common Shares as set forth in the Business Combination Agreement be reserved for issuance under the TMC Incentive Equity Plan.

Certain DeepGreen Projected Financial Information

DeepGreen's management prepared certain non-public internal financial projections (the "DeepGreen unaudited prospective financial information") regarding DeepGreen's anticipated future operations based on assumptions that DeepGreen's management believed to be reasonable at the time. The DeepGreen unaudited prospective financial information is based solely upon information that was available to DeepGreen's management at the time of its preparation. The DeepGreen unaudited prospective financial information is based on estimates and assumptions made by DeepGreen's management prior to and around March 2021 and speaks only as of that time. Since such date, DeepGreen has not updated the unaudited prospective financial information included in this proxy statement/prospectus and does not intend to do so. The DeepGreen unaudited prospective financial information is not included in this proxy statement/prospectus to induce any SOAC stockholder to vote in favor of the adoption of the Business Combination Agreement or any other proposals to be voted on at the Extraordinary General Meeting, but because such information was made available to SOAC.

The DeepGreen unaudited prospective financial information was not prepared with a view towards public disclosure or compliance with the published guidelines of the SEC or the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information. The DeepGreen unaudited prospective financial information was prepared primarily for internal use, and capital budgeting and other management purposes, and is subjective in many respects and therefore susceptible to varying interpretations and the need for periodic revision based on actual experience and business developments, and was not intended for third-party use, including by investors or shareholders. The DeepGreen unaudited prospective financial information assumes that DeepGreen would continue to operate as a standalone company does not reflect any impact of the Business Combination. You are cautioned not to rely on the DeepGreen unaudited prospective financial information in making a decision regarding the transaction, as such information may be materially different than actual results.

The DeepGreen unaudited prospective financial information reflects numerous assumptions including assumptions with respect to general business, economic, market, regulatory and financial conditions and various other factors, all of which are difficult to predict and many of which are beyond DeepGreen's control, such as the risks and uncertainties contained in the section entitled "*Risk Factors*."

The DeepGreen unaudited prospective financial information contains forward-looking statements that are based on growth and future market pricing assumptions that are inherently subject to significant uncertainties and contingencies, many of which are beyond DeepGreen's control. Because the DeepGreen unaudited prospective financial information covers multiple years, such information by its nature becomes less predictive with each successive year. The inclusion of the DeepGreen unaudited prospective financial information in this proxy statement/prospectus should not be regarded as an indication that DeepGreen, any of its representatives or any other person considered, or currently considers, this information necessarily predictive of actual future results or events, and it should not be relied upon as such. There can be no assurance that the prospective results will be realized or that actual results will not be significantly higher or lower than estimated. In addition, DeepGreen does not endorse the DeepGreen unaudited prospective financial information as a reliable indication of future results.

The DeepGreen unaudited prospective financial information was requested by, and disclosed to, SOAC for use as a component of its overall evaluation of DeepGreen and is included in this proxy statement/prospectus because it was provided to SOAC for its evaluation of the Business Combination. DeepGreen has not warranted as to the accuracy, reliability, appropriateness or completeness of the DeepGreen unaudited prospective financial information to anyone, including SOAC. Neither DeepGreen management nor any of its representatives has made or makes any representation to any person regarding the ultimate performance of DeepGreen compared to the information contained in the DeepGreen unaudited prospective financial information, and none of them intends to or undertakes any obligation to update or otherwise revise the DeepGreen unaudited prospective financial information to reflect circumstances existing after the date when made or to reflect the occurrence of future events in the event that any or all of the assumptions underlying such projections are shown to be in error. Accordingly, the DeepGreen unaudited prospective financial information should not be looked upon as "guidance" of any sort. TMC will not refer back to this information in its future periodic reports filed under the Exchange Act.

The DeepGreen unaudited prospective financial information was prepared by, and is the responsibility of, DeepGreen's management. Ernst & Young LLP ("EY"), DeepGreen's independent auditor, has not audited, reviewed, examined, compiled or otherwise applied agreed-upon procedures with respect to the DeepGreen unaudited prospective financial information presented herein and, accordingly, expresses no opinion or any other form of assurance with respect to such information. The EY report included in this proxy statement/prospectus relates to historical financial information of DeepGreen. It does not extend to the DeepGreen unaudited prospective financial information and should not be read to do so.

The DeepGreen unaudited prospective financial information was based on an economic analysis included in the NORI Technical Report Summary filed as Exhibit 96.1 hereto prepared by AMC. The economic analysis was based on estimates of future cash flows derived from the extraction of nodules from the NORI-D project prepared by DeepGreen and contemplated a 23-year production period. The table below sets forth the key elements of the DeepGreen unaudited prospective financial information, which includes projected EBITDA and projected cash flow for the years 2021 through 2027 because SOAC's financial analysis was supported by multiples of projected EBITDA for NORI-D for the years 2026 and 2027. Additional assumptions underlying the DeepGreen unaudited prospective information are described in "*Information About DeepGreen — Properties — NORI Contract Area — Economic Analysis*." Please see the NORI Technical Report Summary filed as Exhibit 96.1 hereto for further information.

(in millions)	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**	**2027E**
EBITDA							
Revenue	$ —	$ —	$ —	$ 251	$ 1,172	$ 2,253	$ 3,677
Operating Costs	$ 64	$ 75	$ 88	$ 215	$ 751	$ 1,410	$ 1,693
EBITDA	**$ (64)**	**$ (75)**	**$ (88)**	**$ 35**	**$ 421**	**$ 843**	**$ 1,983**
Cash Flow							
Revenue	$ —	$ —	$ —	$ 251	$ 1,172	$ 2,253	$ 3,677
Operating Expenses	$ —	$ —	$ —	$ (206)	$ (751)	$ (1,410)	$ (1,693)
Capital Expenses	$ (64)	$ (142)	$ (297)	$ (893)	$ (1,666)	$ (2,151)	$ (617)
Taxes and Royalties	$ —	$ —	$ —	$ (10)	$ (46)	$ (88)	$ (351)
Net Cash Flow	$ (64)	$ (142)	$ (297)	$ (859)	$ (1,291)	$ (1,395)	$ 1,015
Cumulative Cash Flow	**$ (64)**	**$ (206)**	**$ (503)**	**$ (1,361)**	**$ (2,652)**	**$ (4,047)**	**$ (3,032)**

Certain of the measures included in the DeepGreen unaudited prospective financial information may be considered non-GAAP financial measures. Due to the forward-looking nature of this information, specific quantifications of the amounts that would be required to reconcile such projections to GAAP measures are not available and DeepGreen believes it is not feasible to provide accurate forecasted non-GAAP reconciliations. Non-GAAP financial measures should not be considered in isolation from, or as a substitute for, financial information presented in compliance with GAAP, and non-GAAP financial measures as used by DeepGreen may not be comparable to similarly titled amounts used by other companies.

Summary of SOAC Financial Analysis

The following is a summary of the material financial analyses prepared by SOAC and reviewed by the SOAC Board in connection with the valuation of DeepGreen. The summary set forth below does not purport to be a complete description of the financial analyses performed or factors considered by SOAC nor does the order of the financial analyses described represent the relative importance or weight given to those financial analyses by the SOAC Board. SOAC may have deemed various assumptions more or less probable than other assumptions. Some of the summaries of the financial analyses set forth below include information presented in tabular format. Considering the data in the tables below without considering all financial analyses or factors or the full narrative description of such analyses or factors, including the methodologies and assumptions underlying such analyses or factors, could create a misleading or incomplete view of the processes underlying SOAC's financial analyses and the SOAC Board's recommendation.

In performing analyses, SOAC's management made numerous material assumptions with respect to, among other things, the size of the resource, the timing and cost of commercial production, including pre-production,

collection, shipment, and processing, timing of, and ability to receive, required regulatory approvals, the timing of, and amounts of, any royalty payments, the supply of, and demand for, battery metals and the resulting effect on prices, commercial partnerships, market size, commercial efforts, industry performance, general business and economic conditions and numerous other matters, many of which are beyond the control of SOAC, DeepGreen or any other parties to the Business Combination. None of DeepGreen, SOAC, or any other person assumes responsibility if future results are materially different from those discussed. Any estimates contained in these analyses are not necessarily indicative of actual values or predictive of future results or values, which may be significantly more or less favorable than as set forth below. In addition, analyses relating to the value of DeepGreen do not purport to be appraisals or reflect the prices at which DeepGreen shares may actually be valued or trade in the open market after the consummation of the Business Combination. Accordingly, the assumptions and estimates used in, and the results derived from, the financial analyses are inherently subject to substantial uncertainty. The following quantitative information, to the extent that it is based on market data, is not necessarily indicative of current market conditions.

Comparable Company Analysis

SOAC's management primarily relied upon a comparable company analysis to assess the value that the public markets would likely ascribe to DeepGreen following a business combination with SOAC, and this analysis was presented to the SOAC Board. The selected companies were chosen because they were determined by SOAC's management to be peers in the production of base metals and EV metals, and related to DeepGreen's supply chain or end markets (but, for the avoidance of doubt, each of the selected companies is not necessarily a direct competitor of DeepGreen or directly comparable to DeepGreen). These companies were selected by SOAC's management as the publicly traded companies having businesses with similar business functions and roles, and types of assets. While these companies may share certain characteristics that are similar to those of DeepGreen, the SOAC Board recognized that no company was identical in nature to DeepGreen. In addition, SOAC's management does not have access to non-public information of any of the companies used for comparative purposes. Accordingly, a complete valuation analysis of SOAC and the Business Combination cannot rely solely upon a quantitative review of the comparable publicly traded companies, but involves complex considerations and judgments concerning differences in financial and operating characteristics of such companies, as well as other factors that could affect their value relative to that of SOAC. Therefore, the comparable company analysis is subject to certain limitations.

SOAC's management and the SOAC Board reviewed, among other things, the market capitalization (stock price multiplied by total number of outstanding shares) as multiples of fundamental value (also known as net asset value, and defined as the estimated present value of the future unlevered, after-tax free cash flows that a company is projected to generate from operating its assets, including its existing reserves and estimates of recoverable resources), with respect to select comparable base metal developer companies. Except as set forth in the table below, fundamental values of the comparable companies used in the comparable company analysis were based on the median of the estimates of research analysts as provided by FactSet. The selected comparable base metal developer companies can be summarized as follows:

- ***Western Areas Ltd.*** Western Area is a nickel producer and developer with two high grade nickel mines in Australia.
- ***Ivanhoe Mines Ltd.*** Ivanhoe Mines is a mining company with three principal projects in Southern Africa: the development of new Tier One mines at the Kamoa-Kakula copper discovery in the Democratic Republic of Congo, the Platreef platinum-palladium-nickel-copper-gold discovery in South Africa, and the extensive redevelopment and upgrading of the high-grade Kipushi zinc-copper-germanium-silver mine, also in the Democratic Republic of Congo.
- ***Nickel Mines Limited.*** Nickel Mines is a low cost producer of nickel pig iron, a key ingredient in the production of stainless steel. Nickel Mines holds 80% economic interests in the Hengjaya Nickel and Ranger Nickel projects, both of which operate 2 line Rotary Kiln Electric Furnace plants producing nickel pig iron within the Indonesia Morowali Industrial Park. Nickel Mines also holds an 80% economic interest in the Hengjaya Mineralindo Nickel Mine (Hengjaya Mine), a large tonnage, high grade saprolite deposit located in the Morowali Regency of Central Sulawesi, Indonesia.

- ***Trilogy Metals Inc.*** Trilogy Metals is a mining company advancing exploration and development at the Upper Kobuk Mineral Projects, high-grade copper-zinc-lead-gold-silver-cobalt properties in Northwest Alaska.
- ***Nevada Copper Corp.*** Nevada Copper is a US copper producer and owner of the Pumpkin Hollow property located in the State of Nevada, which hosts an underground project that is now in production, and an open pit development.
- ***Seabridge Gold Inc.*** Seabridge Gold is a mining company with principal projects in Canada, including the Kerr Sulphurets Mitchell gold-silver-molybdenum-copper mine in northwest British Columbia, Canada.
- ***Northern Dynasty Minerals Ltd.*** Northern Dynasty is the 100% owner of the Pebble Partnership, which is advancing the Pebble deposit in Alaska, an undeveloped copper and gold resource, toward permitting and development.
- ***SolGold plc.*** SolGold is an exploration company focused on copper and gold projects, with projects primarily in Ecuador, as well as Australia and the Solomon Islands.

The multiples of fundamental value with respect to select such comparable base metal developer companies, calculated using publicly available information, and DeepGreen are summarized in the table below:

	DeepGreen	Western Areas	Ivanhoe Mines	Nickel Mines	Trilogy Metals
Market Capitalization[1] Multiples of Fundamental Value[2]	0.35x[3]	1.1x	0.9x	0.8x	0.7x

	Nevada Copper	Seabridge Gold	Northern Dynasty	SolGold[4]
Market Capitalization[1] Multiples of Fundamental Value[2]	0.4x	0.3x	0.3x	0.2x

(1) Market capitalization is calculated by multiplying the stock price by the number of outstanding shares.
(2) Fundamental value is calculated as the estimated present value of the future unlevered, after-tax free cash flows that a company is projected to generate from operating its assets, including its existing reserves and estimates of recoverable resources. Net asset value of the comparable companies used in the comparable company analysis, except for DeepGreen and SolGold, is based on the median of the estimates of research analysts as provided by FactSet.
(3) Market capitalization of DeepGreen is calculated by multiplying price per share of $10 by the number of shares pro forma the completion of the business combination with SOAC.
(4) Fundamental value of DeepGreen is calculated as the fundamental value of NORI-D of $6.8 billion is calculated as the fundamental value of $8.8 billion, as provided by the SEC Regulation S-K (Subpart 1300) Compliant NORI Area D Clarion Clipperton Zone Mineral Resource Estimate and associated financial model, AMC, March 2021, as of December 31, 2023 using a discount rate of 9%, and further discounted to December 31, 2020 at a discount rate of 9%.
(5) Fundamental value for SolGold is based on the median of the estimates from broker reports published by Hannam & Partners LLP, Peel Hunt LLP and Cantor Fitzgerald L.P. on February 5, 2021, January 19, 2021 and December 10, 2020, respectively.

SOAC's management and the SOAC Board also reviewed, among other things, the fundamental value as multiples of EBITDA for calendar years 2026 and 2027 with respect to select comparable EV metal producer peer groups. The selected comparable EV metal producer peer groups can be summarized as follows:

- ***Base Metals Producers.*** This peer group includes Southern Copper Corporation, a company that focuses on integrated production of various metals, OZ Minerals Limited, a company that focuses predominately on copper mining and production, Antofagasta PLC, a company that focuses predominately on copper mining and production, First Quantum Minerals Limited., a company that focuses on mineral exploration, development and mining, Freeport-McMoran Inc., a company that focuses on mining of various metals and minerals, and Lundin Mining Corporation, a company that focuses on base metals mining.
- ***EV Metal Producers.*** This peer group includes Livent Corporation, a company that focuses on production and distribution of lithium compounds, Albermarle Corporation, a company that focuses on specialty

chemicals production (including lithium), Sociedad Quimica y Minera de Chile SA, a company that focuses on chemical production (including lithium), Lynas Rare Earths Limited, a company that focuses on rare-earths mining, and MP Materials Corporation, a company that focuses on rare-earths mining.

- ***Battery Value Chain.*** This peer group includes Contemprorary Amperex Technology Corporation, a company that focuses on manufacturing of lithium-ion batteries, Microvast, Inc., a company that focuses on production of battery power systems for EVs, BYD Company Limited, a company that focuses predominately on manufacturing automobiles and secondary rechargeable batteries, Quantumscape Corporation, a company that focuses on solid-state battery technology, LG Chem Limited, a company that focuses on chemicals production, and Panasonic Corporation, a company that focuses on electronics production.

- ***Disruptive Battery EVs.*** This peer group includes Tesla Inc., a company that focuses predominately on EV production, Proterra, Inc., a company that focuses on battery-electric bus production, Lion Electric Company, a company that focuses on manufacturing all-electric school buses, and Arrival Limited, a company that focuses on manufacturing electric public transportation vehicles.

- ***Electrification Facilitators.*** This peer group includes Chargepoint, Inc., a company that focuses on developing and manufacturing technology for their network of electric vehicle charging stations, Eos Energy Enterprises Inc., a company that focuses on energy-storage solutions, EVgo Services LLC, a company that focuses on developing an EV fast charging network, Romeo Power, Inc., a company that focuses on production of energy-dense battery packs, and EVBox Group, a company that focuses on manufacturing of EV charging stations and charging management software.

The multiples of EBITDA with respect to such comparable EV metal producer companies, calculated using publicly available information, and DeepGreen are summarized in the table below:

	DeepGreen[(1)]	Base Metal Producers	EV Metal Producers	Battery Value Chain[(2)]	Disruptive Battery EVs[(3)]	Electrification Facilitators[(4)]
Fundamental Value Multiples of 2026E EBITDA	2.8x	6.8x	17.3x	25.3x	21.3x	33.9x
Fundamental Value Multiples of 2027E EBITDA	1.2x	6.4x	14.5x	15.2x	8.0x	15.9x

(1) DeepGreen multiples are based on 2026E and 2027E EBITDA for NORI-D.
(2) Quantumscape multiples are based on 2027E and 2028E. Microvast multiples are based on 2023E and 2024E.
(3) Disruptive battery EV multiples are based on 2023E and 2024E. Proterra multiples are based on 2024E and 2025E.
(4) Electrification facilitators multiples are based on 2023E and 2024E. EVBox 2023E multiple was not considered as it exceeds 150x and its 2024E multiple was not considered due to the lack of a 2024E EBITDA projection.

The SOAC Board concluded that DeepGreen's market capitalization as multiples of fundamental value were an attractive valuation relative to the market capitalization as multiples of fundamental value of the selected comparable base metal developer companies, and DeepGreen's fundamental value as multiples of 2026 and 2027 estimated EBITDA were an attractive valuation relative to the fundamental value as multiples of 2026 and 2027 estimated EBITDA of the selected comparable EV metal producer peer groups.

The results of the above referenced analysis supported the SOAC Board's determination, based on a number of factors, that it was fair to and in the best interests of SOAC and its shareholders, and that it was advisable, to enter into the Business Combination Agreement and the ancillary documents to which SOAC is or will be a party and to consummate the transactions contemplated thereby (including the Business Combination). For additional information, see the section entitled "*Business Combination Proposal — The SOAC Board of Directors' Reasons for the Business Combination*".

Satisfaction of 80% Test

It is a requirement under the Existing Governing Documents that any business acquired by SOAC have a fair market value equal to at least 80% of the balance of the funds in the trust account at the time of the execution of a definitive agreement for an initial business combination. Based on the financial analysis of DeepGreen generally used to approve the transaction, the SOAC board of directors determined that this requirement was met. The board determined that the consideration being paid in the Business Combination, which amount was negotiated at arms-length, was fair to and in the best interests of SOAC and its shareholders and appropriately reflected

DeepGreen's value. In reaching this determination, the board concluded that it was appropriate to base such valuation in part on qualitative factors such as management strength and depth, competitive positioning, customer relationships, and technical skills, as well as quantitative factors such as DeepGreen's potential for future growth in revenue and profits. The SOAC Board believes that the financial skills and background of its members qualify it to conclude that the acquisition of DeepGreen met this requirement.

Interests of SOAC's Directors and Executive Officers in the Business Combination

When you consider the recommendation of the SOAC Board in favor of approval of the Business Combination Proposal, you should keep in mind that the initial shareholders, including SOAC's directors and executive officers, have interests in such proposal that are different from, or in addition to, those of SOAC shareholders and warrant holders generally. These interests include, among other things, the interests listed below:

- the fact that our initial shareholders have agreed not to redeem any Class A ordinary shares held by them in connection with a shareholder vote to approve a proposed initial business combination;
- the fact that Sponsor paid an aggregate of $25,000 for the 7,500,000 Class B ordinary shares currently owned by the initial shareholders and such securities will have a significantly higher value at the time of the Business Combination;
- the fact that Sponsor paid $9,500,000 for its private placement warrants, and the Class A ordinary shares underlying those warrants would be worthless if a business combination is not consummated by November 8, 2021 (unless such date is extended in accordance with the Existing Governing Documents);
- the fact that the initial shareholders and SOAC's other current officers and directors have agreed to waive their rights to liquidating distributions from the trust account with respect to any ordinary shares (other than public shares) held by them if SOAC fails to complete an initial business combination by November 8, 2021;
- the fact that the Amended and Restated Registration Rights Agreement will be entered into by the initial shareholders;
- the right of the initial shareholders to hold Class A ordinary shares following the Business Combination, subject to certain lock-up periods;
- the right of Sponsor to hold TMC Sponsor Earnout Shares following the Business Combination;
- the fact that, at the option of Sponsor, any amounts outstanding under any loan made by Sponsor or any of its affiliates to SOAC in an aggregate amount of up to $1,500,000 may be converted into warrants to purchase Class A ordinary shares in connection with the consummation of the Business Combination;
- the continued indemnification of SOAC's directors and officers and the continuation of SOAC's directors' and officers' liability insurance after the Business Combination (i.e., a "tail policy");
- the fact that Sponsor and SOAC's officers and directors will lose their entire investment in SOAC and will not be reimbursed for any out-of-pocket expenses if an initial business combination is not consummated by November 8, 2021;
- the fact that if the trust account is liquidated, including in the event SOAC is unable to complete an initial business combination by November 8, 2021, Sponsor has agreed to indemnify SOAC to ensure that the proceeds in the trust account are not reduced below $10.00 per public share, or such lesser per public share amount as is in the trust account on the liquidation date, by the claims of prospective target businesses with which SOAC has entered into an acquisition agreement or claims of any third party for services rendered or products sold to SOAC, but only if such a vendor or target business has not executed a waiver of any and all rights to seek access to the trust account; and
- the fact that SOAC may be entitled to distribute or pay over funds held by SOAC outside the trust account to Sponsor or any of its affiliates prior to the Closing.

The initial shareholders have, pursuant to the Sponsor Letter Agreement, agreed to, among other things, vote all of their ordinary shares in favor of the proposals being presented at the extraordinary general meeting and waive their anti-dilution rights with respect to their Class B ordinary shares in connection with the consummation of the Business Combination. Such shares will be excluded from the pro rata calculation used to determine the per-share redemption price. As of the date of this proxy statement/prospectus, the initial shareholders own approximately 20% of the issued and outstanding ordinary shares. See "*Business Combination Proposal — Related Agreements — Sponsor Letter Agreement*" in the accompanying proxy statement/prospectus for more information related to the Sponsor Letter Agreement.

At any time at or prior to the Business Combination, during a period when they are not then aware of any material nonpublic information regarding us or our securities, our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates may purchase public shares from institutional and other investors who vote, or indicate an intention to vote, against any of the Condition Precedent Proposals, or execute agreements to purchase such shares from such investors in the future, or they may enter into transactions with such investors and others to provide them with incentives to acquire public shares or vote their public shares in favor of the Condition Precedent Proposals. Such a purchase may include a contractual acknowledgement that such shareholder, although still the record or beneficial holder of our shares, is no longer the beneficial owner thereof and therefore agrees not to exercise its redemption rights. In the event that our initial shareholders, DeepGreen and/or their directors, officers, advisors or respective affiliates purchase shares in privately negotiated transactions from public shareholders who have already elected to exercise their redemption rights, such selling shareholder would be required to revoke their prior elections to redeem their shares. The purpose of such share purchases and other transactions would be to increase the likelihood of satisfaction of the requirements that (i) the Business Combination Proposal, the NYSE Proposal, the Incentive Award Plan Proposal and the Adjournment Proposal are approved by the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, and (ii) the Continuance Proposal and the Charter Proposal are approved by the affirmative vote of at least two-thirds (2/3) of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter, or otherwise limit the number of public shares electing to redeem.

Entering into any such arrangements may have a depressive effect on the ordinary shares. For example, as a result of these arrangements, an investor or holder may have the ability to effectively purchase shares at a price lower than market and may therefore be more likely to sell the shares he or she owns, either at or prior to the Business Combination.

If such transactions are effected, the consequence could be to cause the Business Combination to be consummated in circumstances where such consummation could not otherwise occur. Purchases of shares by the persons described above would allow them to exert more influence over the approval of the proposals to be presented at the extraordinary general meeting and would likely increase the chances that such proposals would be approved. We will file or submit a Current Report on Form 8-K to disclose any material arrangements entered into or significant purchases made by any of the aforementioned persons that would affect the vote on the proposals to be put to the extraordinary general meeting or the redemption threshold. Any such report will include descriptions of any arrangements entered into or significant purchases by any of the aforementioned persons.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder.

Expected Accounting Treatment of the Business Combination

The Business Combination will be accounted for as a reverse recapitalization in conformity with GAAP. Under this method of accounting, SOAC has been treated as the "acquired" company for financial reporting purposes. This determination was primarily based on the Existing DeepGreen Securityholders comprising a relative majority of the voting power of the combined company, DeepGreen's operations prior to the acquisition comprising the only ongoing operations of TMC, and DeepGreen's senior management comprising a majority of the senior management of TMC. Accordingly, for accounting purposes, the financial statements of the combined entity will

represent a continuation of the financial statements of DeepGreen with the Business Combination being treated as the equivalent of DeepGreen issuing shares for the net assets of SOAC, accompanied by a recapitalization. The net assets of SOAC will be stated at historical costs, with no goodwill or other intangible assets recorded.

Vote Required for Approval

The approval of the Business Combination Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of a majority of the ordinary shares represented in person or by proxy and entitled to vote thereon and who vote at the extraordinary general meeting.

Resolution

The full text of the resolution to be passed is as follows:

"RESOLVED, as an ordinary resolution, that SOAC's entry into the Business Combination Agreement, dated March 4, 2021 (as may be amended, supplemented or otherwise modified from time to time, the "Business Combination Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub"), and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada ("DeepGreen"), a copy of which is attached to this proxy statement/prospectus as Annex A, pursuant to which, among other things, promptly following the Continuance, (A) pursuant to a court-approved plan of arrangement under the BCBCA, (i) SOAC will acquire all of the issued and outstanding common shares in the capital of DeepGreen ("DeepGreen Common Shares"); (ii) the shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Common Shares and DeepGreen Options, as applicable, the following shares or options to purchase the shares: an aggregate of (a) 230,600,000 common shares in the capital of TMC ("TMC Common Shares"), assuming an Adjusted Equity Value (as defined in the Business Combination Agreement) immediately prior to the effective time of approximately $2.3 billion; (b) 5,000,000 Class A Special Shares; (c) 10,000,000 Class B Special Shares; (d) 10,000,000 Class C Special Shares; (e) 20,000,000 Class D Special Shares; (f) 20,000,000 Class E Special Shares; (g) 20,000,000 Class F Special Shares; (h) 25,000,000 Class G Special Shares; and (i) 25,000,000 Class H Special Shares, in each case, in the capital of TMC, each of which are automatically convertible into TMC Common Shares on a one for one basis (unless adjusted as described herein) if certain share price thresholds are met as described in this proxy statement/prospectus (collectively, the "DeepGreen Earnout Shares"), (iii) DeepGreen will become a wholly-owned subsidiary of TMC; and (iv) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company existing under the laws of British Columbia, Canada, and (B) the Allseas Warrant shall be assumed by TMC and shall become a warrant to purchase TMC Common Shares, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement, certain related agreements (including the Subscription Agreements, the Transaction Support Agreements, the Sponsor Letter Agreement and the Amended and Restated Registration Rights Agreement, each in the form attached to the proxy statement/prospectus as Annex E, Annex F, Annex G, and Annex H, respectively), and the transactions contemplated thereby, be approved, ratified and confirmed in all respects."

Recommendation of the SOAC Board

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT THE SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE BUSINESS COMBINATION PROPOSAL.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*— Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

PROPOSAL NO. 3 — THE CHARTER PROPOSAL

Overview

SOAC shareholders are also being asked to approve the TMC Notice and Articles as the governing documents of TMC as a result and upon the Continuance, reflecting the authorized share capital described therein and the change of name of SOAC to "TMC the metals company Inc.," in the form attached hereto as Annex B and Annex C, which, in the judgment of the SOAC Board, is necessary to adequately address the needs of SOAC following the Continuance and the consummation of the Business Combination.

For a summary of the key differences between the Memorandum and Articles of Association of SOAC under Cayman Islands law and the TMC Notice and Articles under the BCBCA, please see *"Proposal No. 4: The Organizational Documents Proposals."* The summary is qualified in its entirety by reference to the full text of the TMC Notice and Articles, the form of which is included as Annex B and Annex C to this proxy statement/prospectus.

Resolution

The full text of the resolution to be passed is as follows:

"RESOLVED, as a result of and upon the consummation of the Continuance, as a special resolution, that the notice and articles of TMC the metals company Inc. (the "TMC Articles") become, in replacement of the Amended and Restated Memorandum and Articles of Association of Sustainable Opportunities Acquisition Corp., the governing documents of TMC, including the change in authorized share capital and change of name of Sustainable Opportunities Acquisition Corp. to TMC the metals company Inc., each as reflected in the TMC Articles."

Required Vote With Respect to the Charter Proposal

The approval of the Charter Proposal requires a special resolution under Cayman Islands law, being the affirmative vote of holders of at least two-thirds of the ordinary shares represented in person or by proxy and entitled to vote thereon and who vote at the Shareholders Meeting. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the Shareholders Meeting.

If any of the Continuance Proposal, the Business Combination Proposal, the Charter Proposal or the NYSE Proposal fails to receive the required shareholder approval, the Business Combination will not be completed.

Recommendation of the SOAC Board with Respect to the Charter Proposal

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT THE SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE CHARTER PROPOSAL.

PROPOSAL NO. 4 — THE ORGANIZATIONAL DOCUMENTS PROPOSALS

Overview

SOAC's shareholders are asked to consider and vote upon, on a non-binding advisory basis, five separate proposals (collectively, the "Organizational Documents Proposals") in connection with the replacement of the Existing Governing Documents with the TMC Notice and Articles. The Organizational Documents Proposals are not conditioned on the approval of any other proposal.

In the judgment of the SOAC Board, these provisions are necessary to adequately address the needs of SOAC and its shareholders following the consummation of the Continuance and the Business Combination. Accordingly, regardless of the outcome of the non-binding advisory vote on these proposals, SOAC intends that the TMC Notice and Articles in the form set forth on Annex B and Annex C will take effect at consummation of the Continuance, assuming adoption of the Charter Proposal.

Comparison of Shareholder Rights under the Applicable Organizational Documents Before and After the Continuance

The TMC Notice and Articles differ materially from the Existing Governing Documents. The following table sets forth a summary of the principal differences between our Amended and Restated Memorandum and Articles of Association and the TMC Notice and Articles. This summary is qualified by reference to the complete text of the Existing Governing Documents of SOAC, attached to this proxy statement/prospectus as Annex I, and the complete text of the form of TMC Notice and Articles, which is attached to this proxy statement/prospectus as Annex B and Annex C, respectively. All shareholders are encouraged to read the TMC Notice and Articles in its entirety for a more complete description of its terms. Additionally, as the Existing Governing Documents are governed by the Cayman Islands law and the TMC Notice and Articles will be governed by the BCBCA, we encourage shareholders to carefully consult the information set out under this section, "*Proposal No. 3 — The Charter Proposal*" and "*Comparison of Corporate Governance and Shareholder Rights*."

	Existing Governing Documents	TMC Notice and Articles
Governing Statute	The Companies Act (as Revised) of the Cayman Islands.	*Business Corporations Act* (British Columbia)
Corporate Name	Sustainable Opportunities Acquisition Corp.	TMC the metals company Inc.
Authorized Capital	300,000,000 Class A ordinary shares, 30,000,000 Class B ordinary shares, and 1,000,000 preference shares, each with a par value of $0.0001 per share.	An unlimited number of common shares, an unlimited number of preferred shares, issuable in series, 5,000,000 Class A Special Shares, 10,000,000 Class B Special Shares, 10,000,000 Class C Special Shares, 20,000,000 Class D Special Shares, 20,000,000 Class E Special Shares, 20,000,000 Class F Special Shares, 25,000,000 Class G Special Shares, 25,000,000 Class H Special Shares, 500,000 Class I Special Shares, and 741,000 Class J Special Shares, each without par value. See "*Description of TMC Securities*" for a description of the rights and restrictions attached to the securities of TMC upon the Continuance.

	Existing Governing Documents	TMC Notice and Articles
Directors; Classes	The directors are divided into three classes: Class I; Class II; and Class III. The Class I directors stand appointed for a term expiring at SOAC's first annual general meeting, the Class II directors stand appointed for a term expiring at SOAC's second annual general meeting and the Class III directors shall stand appointed for a term expiring at SOAC's third annual general meeting. Directors appointed to succeed those directors who terms expire shall be appointed for a term of office to expire at the third succeeding annual general meeting after their appointment.	The board of directors will consist of a minimum of three directors. Following the Continuance, the board of directors of TMC will be composed of nine directors. The board of directors will not be divided into classes and each director will be elected on an annual basis.
Notice of Shareholder Meeting	At least five days' notice is given of any shareholder meeting.	The board of directors of TMC will have the power to call a meeting of shareholders. Under the BCBCA and in certain circumstances, shareholders can also requisition meetings. The time period to provide notice of the time and place of a meeting of shareholders is not less than 21 days and not more than two months before the meeting.
Shareholder Written Consent in Lieu of a Meeting	No special business shall be transacted at any general meeting without the consent of all Shareholders entitled to receive notice of that meeting unless notice of such special business has been given in the notice convening that meeting. A resolution signed by all shareholders shall be as valid and effective as if the resolution had been passed at a general meeting of the Company.	The shareholders may consent to all of the business that is required to be transacted at a meeting of shareholders by unanimous written resolution, as provided for under the BCBCA. An ordinary resolution of shareholders may be passed if it is consented to in writing by shareholders holding shares that carry at least two-thirds of the votes entitled to be cast on the resolution, provided that the resolution has been submitted to all shareholders holding shares that carry the right to vote at general meetings.
Quorum	The holders of a majority of the shares being individuals present in person or by proxy or if a corporation or other non-natural person by its duly authorized representative or proxy shall be a quorum.	Subject to the special rights and restrictions attached to the shares of any class or series of shares of the Company, a quorum is present at a meeting of shareholders if at least two shareholders, representing not less than one-third ($33^{1}/_{3}$%) of the shares entitled to vote at such meeting, are present in person or represented by proxy.

	Existing Governing Documents	TMC Notice and Articles
Shareholder Vote; Casting Vote	In the case of an equality of votes, at either a meeting of shareholders or a meeting of directors, the chairman shall be entitled to a second or casting vote. Provisions of the amended and restated memorandum and articles of association may be amended with a shareholder vote.	In the case of an equality of votes, at either a meeting of shareholders or a meeting of directors, the chair of the meeting is not entitled to a second or casting vote. Provisions of the TMC Notice and Articles may be amended with a shareholder vote.
Advance Notice; Director Nominations; Shareholder Proposals;	Members seeking to bring business before the annual general meeting or to nominate candidates for appointment as directors at the annual general meeting must deliver notice to the principal executive offices of SOAC not less than 120 calendar days before the date of SOAC's proxy statement released to members in connection with the previous year's annual general meeting or, if the Company did not hold an annual general meeting the previous year, or if the date of the current year's annual general meeting has been changed by more than 30 days from the date of the previous year's annual general meeting, then the deadline shall be set by the board of Directors with such deadline being a reasonable time before the Company begins to print and send its related proxy materials.	Nominations of persons for election to the board may be made for any annual meeting of shareholders, or for any special meeting of shareholders if one of the purposes for which the special meeting was called was the election of directors by a nominating shareholder provided that the nomination is made, in the case of an annual meeting of shareholders, not less than 30 days prior to the date of the annual meeting of shareholders; provided, however, that in the event that the annual meeting of shareholders is to be held on a date that is less than 50 days after the date (the "Notice Date") on which the first public announcement of the date of the annual meeting was made, notice by the nominating shareholder may be made not later than the close of business on the tenth (10^{th}) day following the Notice Date; and in the case of a special meeting (which is not also an annual meeting) of shareholders called for the purpose of electing directors of the Corporation, not later than the close of business on the fifteenth (15^{th}) day following the Notice Date. To be in proper form, the notice of nomination must include certain prescribed information about the nominating shareholder and the proposed nominee. Shareholder proposals are otherwise governed by the provisions of the BCBCA.

	Existing Governing Documents	TMC Notice and Articles
Forum Selection	None.	Unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada and the appellate Courts therefrom, will, to the fullest extent permitted by law, be the sole and exclusive forum for: (i) any derivative action or proceeding brought on behalf of TMC; (ii) any action or proceeding asserting breach of fiduciary duty owed by any director, officer or other employee of TMC to TMC; (iii) any action or proceeding asserting a claim arising pursuant to any provision of the BCBCA, or TMC Notice and Articles; or (iv) any action or proceeding asserting a claim otherwise related to the relationships among TMC, its affiliates and their respective shareholders, directors and/or officers, but excluding claims related to TMC's business or of such affiliates. The foregoing will not apply to any action brought to enforce a duty or liability created by the Securities Act or the Exchange Act, or the rules and regulations thereunder. Unless TMC consents in writing to the selection of an alternative forum, the federal district courts of the United States of America will be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act.
Takeovers by Interested Shareholders	None.	The TMC Notice and Articles will not include provisions with respect to takeovers of the Company.

The Organizational documents Proposals to be voted on by SOAC's shareholders on are as follows:

1. *Organizational Documents Proposal 4A* — The establishment of the authorized capital of TMC to consist of an unlimited number of common shares, an unlimited number of preferred shares, issuable in series, and the TMC Special Shares, in each case, without par value.
2. *Organizational Documents Proposal 4B* **—** the declassification of the board of directors with the result being that each director will be elected on an annual basis.
3. *Organizational Documents Proposal 4C* **—** the reduction of the requisite quorum for a meeting of shareholders from a majority to at least two shareholders representing no less than one-third ($33^{1/3}$%) of the shares entitled to vote at such meeting.
4. *Organizational Documents Proposal 4D* **—** the inclusion of an advance notice provision that requires a shareholder to provide notice to TMC in advance of a meeting of shareholders should such shareholder wish to nominate a person for election to the board of directors.
5. *Organizational Documents Proposal 4E* **—** the inclusion of a forum selection provision whereby, subject to limited exceptions or unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada, and the appellate courts therefrom, will be the sole and exclusive forum for certain shareholder litigation matters.

6. *Organizational Documents Proposal 4F* — certain other changes, including the changes in rights and restrictions attached to the Class B ordinary shares, and the deletion of provisions relating to the initial public offering, the Sponsors, the initial business combination and other related matters.

Resolution

The full text of the resolution to be passed in connection with the replacement of the Existing Governing Documents with the TMC Notice and Articles is as follows:

"RESOLVED, as a non-binding advisory resolution, that the TMC Notice and Articles (the forms of which are attached to the proxy statement/prospectus in respect of the Shareholders Meeting as Annex B and Annex C), will be approved and adopted upon the consummation of the Continuance with such principal changes as described in Organizational Documents Proposals 4A – 4F."

Required Vote With Respect to the Organizational Documents Proposals

The approval of the Organizational Documents Proposals will require the affirmative vote of holders of the majority of the ordinary shares, represented in person or by proxy and entitled to vote at the Shareholders Meeting. Accordingly, a SOAC shareholders' failure to vote by proxy or to vote in person, as well as an abstention from voting and a broker non-vote with regard to the Organizational Documents Proposals will have no effect on the governance Organizational Documents Proposal. Abstentions will be counted in connection with the determination of whether a valid quorum is established but will have no effect on the Organizational Documents Proposal.

As discussed above, a vote to approve the Organizational Documents Proposals is an advisory vote, and therefore, is not binding on SOAC or its Board. Accordingly, regardless of the outcome of the non-binding advisory vote, SOAC intends that the TMC Notice and Articles, in the forms set forth on Annex B and Annex C of the proxy statement and prospectus and containing the provisions noted above, will take effect at consummation of the Continuance, assuming adoption of the Charter Proposal.

If any of the Continuance Proposal, the Business Combination Proposal, the Charter Proposal or the NYSE Proposal fails to receive the required shareholder approval, the Business Combination will not be completed. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the Shareholders Meeting.

Recommendation of the SOAC Board with Respect to the Organizational Documents Proposals

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT THE SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE ORGANIZATIONAL DOCUMENTS PROPOSALS.

PROPOSAL NO. 5 — NYSE PROPOSAL

Overview

The NYSE Proposal — to consider and vote upon a proposal to approve by ordinary resolution for the purposes of complying with the applicable provisions of the NYSE Listing Rule 312.03, the issuance of TMC Common Shares and securities convertible into or exchangeable for TMC Common Shares in connection with the Business Combination and PIPE Financing.

Reasons for the Approval for Purposes of NYSE Listing Rule 312.03

Under NYSE Listing Rule 312.03, a company is required to obtain shareholder approval prior to the issuance of common shares, or of securities convertible into or exercisable for common shares, if the number of common shares to be issued is, or will be upon issuance, equal to or in excess of 20% of the number of common shares outstanding before the issuance of the common shares or of securities convertible into or exercisable for common shares. In connection with the Business Combination and PIPE Financing, SOAC currently expects to issue an estimated TMC Common Shares (including TMC Common Shares to be issued upon the exchange or conversion of securities to be outstanding upon consummation of the Business Combination).

Additionally, pursuant to NYSE Listing Rule 312.03, when a NYSE-listed company proposes to issue securities in connection with the Business Combination of the shares or assets of another company, shareholder approval is required if a substantial shareholder of such company has a 5% or greater interest, directly or indirectly, in such company or the assets to be acquired or in the consideration to be paid in the transaction or series of related transactions and the present or potential issuance of common shares could result in an increase in outstanding common shares or voting power of 5% or more. NYSE Listing Rule 312.03(e) defines a substantial shareholder as the holder of an interest of 5% or more of either the number of common shares or the voting power outstanding of a NYSE-listed company. Because Sponsor currently owns greater than 5% of SOAC's ordinary shares, Sponsor is considered a substantial shareholder of SOAC under NYSE Listing Rule 312.03(e).

In the event that this proposal is not approved by SOAC's shareholders, the Business Combination cannot be consummated. In the event that this proposal is approved by SOAC's shareholders, but the Business Combination is not consummated, TMC will not issue such TMC Common Shares.

Required Vote With Respect to the NYSE Proposal

The approval of the NYSE Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the Shareholders Meeting and entitled to vote on such matter. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the Shareholders Meeting. The NYSE Proposal is conditioned on the approval and adoption of each of the other Condition Precedent Proposals.

Resolution

The full text of the resolution to be passed is as follows:

"**RESOLVED**, as an ordinary resolution, that for the purposes of complying with the applicable provisions of NYSE Listing Rule 312.03, the issuance of TMC Common Shares and securities convertible into or exchangeable for TMC Common Shares in connection with the Business Combination, and the TMC Common Shares issuable with the PIPE Financing be approved."

Recommendation of the SOAC Board

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE NYSE PROPOSAL.

PROPOSAL NO. 6 — INCENTIVE EQUITY PLAN PROPOSAL

Summary of the Material Features of the TMC Incentive Equity Plan

Eligibility.

The TMC the metals company Inc. 2021 Incentive Equity Plan (the "TMC Incentive Equity Plan") will allow for grants, under the direction of the board of directors or compensation committee, as the plan administrator, of stock options, stock appreciation rights, restricted stock awards, stock awards, restricted stock units and other stock or equity-related cash-based awards to employees, consultants and non-employee directors who, in the opinion of the plan administrator, are in a position to make a significant contribution to the long-term success of TMC the metals company Inc. ("TMC"). All employees, non-employee directors and consultants of TMC and its affiliates will be eligible to participate in the TMC Incentive Equity Plan.

Shares Available for Issuance.

The TMC Incentive Equity Plan provides for the future issuance of 11% of the number of outstanding TMC common shares as of the date of closing of the Business Combination, provided that 1/11th of the TMC common shares available under the Plan will only be available to non-employee directors of TMC. Notwithstanding the foregoing, the number of future shares that may be issued will increase automatically on the first day of each fiscal year during the period beginning with fiscal year 2022 and ending on the tenth anniversary of the closing of the Business Combination, equal to the lesser of (a) 4% of the number of outstanding TMC common shares on such date, and (b) an amount determined by the plan administrator.

Generally, TMC common shares reserved for awards under the TMC Incentive Equity Plan that lapse or are forfeited or cancelled will be added back to the share reserve available for future awards. However, shares delivered to or withheld to pay withholding taxes or any applicable exercise price will not be available for issuance under the TMC Incentive Equity Plan. In addition, any shares repurchased on the open market using exercise price proceeds will not be available for issuance under the TMC Incentive Equity Plan.

The aggregate grant date fair value of shares granted to any non-employee director under the TMC Incentive Equity Plan and any other cash compensation paid to any non-employee director in any calendar year may not exceed $500,000; increased to $750,000 in the year in which such non-employee director initially joins the board of directors.

Stock Options.

The terms and conditions of TMC's ability to grant stock options are governed by the TMC Incentive Equity Plan. Notably, TMC has established a sub-plan to the TMC Incentive Equity Plan (the "U.S. Sub-Plan") for the purpose of granting stock options to employees who are residents of the United States or who are or may become subject to U.S. tax. Stock options granted under the U.S. Sub-Plan may either be incentive stock options, which are intended to satisfy the requirements of Section 422 of the Code, or non-qualified stock options. Incentive stock options may be granted to employees of TMC and its affiliates, and the aggregate fair market value of a TMC common share determined at the time of grant with respect to incentive stock options that are exercisable for the first time by a participant during any calendar year may not exceed $100,000. Non-qualified options may be granted to employees, non-employee directors and consultants of TMC and its affiliates. If an incentive stock option is granted to an individual who owns 10% or less of the combined voting power of all classes of stock of TMC or an affiliate of TMC, the exercise price of the stock option may not be less than 100% of the fair market value of the TMC common shares on the date of grant, and the term of the stock option may not be longer than ten years. If an incentive stock option is granted to an individual who owns more than 10% of the combined voting power of all classes of stock of TMC or an affiliate of TMC, the exercise price of the stock option may not be less than 110% of the fair market value of the TMC common shares on the date of grant, and the term of the stock option may not be longer than five years.

Award agreements for stock options include rules for exercise of the stock options after termination of service. Options may not be exercised unless they are vested, and no option may be exercised after the end of the term set forth in the award agreement. Generally, stock options will be exercisable for three months after termination of service for any reason other than death or total and permanent disability, and for one (1) year after termination of service on account of death or total and permanent disability, but will not be exercisable if the termination of service was due to cause.

Restricted Stock.

Restricted stock a common share that is subject to restrictions, including a prohibition against transfer and a substantial risk of forfeiture, until the end of a "restricted period" during which the grantee must satisfy certain time or performance-based vesting conditions. If the grantee does not satisfy the vesting conditions by the end of the restricted period, the restricted stock is forfeited. During the restricted period, the holder of restricted stock has the rights and privileges of a regular stockholder, except that generally dividend equivalents may accrue but will not be paid during the restricted period, and the restrictions set forth in the applicable award agreement apply. For example, the holder of restricted stock may vote the restricted shares, but he or she may not sell the shares until the restrictions are lifted.

Restricted Stock Units.

Restricted stock units vest in accordance with terms and conditions established by the plan administrator and when the applicable restrictions lapse, the grantee will be entitled to receive a payout in cash, shares or a combination thereof based on the number of restricted stock units as specified in the award agreement. Dividend equivalents may accrue but will not be paid prior to and only to the extent that, the restricted stock unit award vests. The holder of restricted stock units does not have the rights and privileges of a regular stockholder, including the ability to vote the restricted stock units.

Other Stock-Based Awards and Performance-Based Awards.

The TMC Incentive Equity Plan also authorizes the grant of other types of stock-based compensation including, but not limited to stock appreciation rights and unrestricted stock awards. The plan administrator may award such stock-based awards subject to such conditions and restrictions as it may determine. We may grant an award conditioned on satisfaction of certain performance criteria. Such performance-based awards also include performance-based restricted shares and restricted stock units. Any dividends or dividend equivalents payable or credited to a participant with respect to any unvested performance-based award will be subject to the same performance goals as the shares or units underlying the performance-based award.

Plan Administration.

In accordance with the terms of the TMC Incentive Equity Plan, the board of directors may administer the TMC Incentive Equity Plan or authorize TMC's compensation committee to administer the TMC Incentive Equity Plan. The compensation committee may delegate part of its authority and powers under the TMC Incentive Equity Plan to one or more TMC directors and/or officers, but only the compensation committee can make awards to participants who are subject to the reporting and other requirements of Section 16 of the Exchange Act. In accordance with the provisions of the TMC Incentive Equity Plan, the plan administrator determines the terms of awards, including, which employees, directors and consultants will be granted awards, the number of shares subject to each award, the vesting provisions of each award, the termination or cancellation provisions applicable to awards, and all other terms and conditions upon which each award may be granted in accordance with the TMC Incentive Equity Plan.

In addition, the plan administrator may, in its discretion, amend any term or condition of an outstanding award provided (i) such term or condition as amended is not prohibited by the TMC Incentive Equity Plan and does not require shareholder approval under the rules of NASDAQ, and (ii) any such amendment will be made only with the consent of the participant to whom such award was made, if the amendment is adverse to the participant unless such amendment is required by applicable law or necessary to preserve the economic value of such award.

Stock Dividends and Stock Splits.

If the TMC common shares are subdivided or combined into a greater or smaller number of shares or if TMC issues any common shares as a stock dividend, the number of TMC common shares deliverable upon exercise of an option issued or upon issuance of an award will be appropriately increased or decreased proportionately, and appropriate adjustments will be made in the exercise price per share of stock options or purchase price, if any, and performance goals applicable to performance-based awards, if any, to reflect such subdivision, combination or stock dividend.

Corporate Transactions.

Upon a merger or other reorganization event, the plan administrator or the board of directors of any entity assuming the obligations of TMC may take any one or more of the following actions pursuant to the TMC Incentive Equity Plan, as to some or all outstanding options and awards:

- provide that all outstanding options will be assumed or substituted by the successor corporation;
- upon written notice to a participant, provide that the participant's unexercised options must be exercised within a specified number of days of the date of such notice, at the end of which period such unexercised options will terminate;
- in the event of a merger pursuant to which holders of TMC Common Shares will receive a cash payment for each share surrendered in the merger, make or provide for a cash payment to option holder participants equal to the difference between the merger price times the number of TMC Common Shares subject to such outstanding options, and the aggregate exercise price of all such outstanding options, in exchange for the termination of such options;
- with respect to other stock awards, provide that outstanding awards will be assumed or substituted by the successor corporation;
- with respect to stock awards, and in lieu of any of the foregoing, provide that, upon consummation of the transaction, each outstanding stock award will be terminated in exchange for payment of an amount equal to the consideration payable upon consummation of such transaction to a holder of the number of common shares comprising such award (to the extent such stock grant or award is no longer subject to any forfeiture or repurchase rights then in effect or, at the discretion of the board of directors or an authorized committee, all forfeiture and repurchase rights being waived upon such transaction); and
- upon consummation of a Corporate Transaction, to the extent not assumed or substituted by the successor or cashed out, the outstanding awards will terminate.

Amendment and Termination.

The TMC Incentive Equity Plan may be amended by TMC's shareholders. It may also be amended by the board of directors or the compensation committee, provided that any amendment which is of a scope that requires stockholder approval as required by (i) the rules of NASDAQ or (ii) for any other reason, is subject to obtaining such stockholder approval. However, no such action may adversely affect any rights under any outstanding award without the holder's consent unless such amendment is required by applicable law or necessary to preserve the economic value of such award.

Duration of Plan.

The TMC Incentive Equity Plan will expire by its terms in April 2031.

New Incentive Equity Plan Benefits

No awards have been previously granted under the TMC Incentive Equity Plan and no awards have been granted that are contingent on shareholder approval of the TMC Incentive Equity Plan. The awards that are to be granted to any participant or group of participants are indeterminable at the date of this proxy statement/prospectus because participation and the types of awards that may be granted under the TMC Incentive Equity Plan are subject to the discretion of the administrator. Consequently, no new plan benefits table is included in this proxy statement/prospectus.

Vote Required for Approval

The approval of the Incentive Award Plan Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the extraordinary general meeting, and otherwise will have no effect on the proposal.

The Incentive Award Plan Proposal is conditioned on the approval and adoption of the Business Combination Proposal, the Continuance Proposal, the Charter Proposal and the NYSE Proposal.

Resolution

The full text of the resolution to be passed is as follows:

"**RESOLVED**, as an ordinary resolution, that the TMC Incentive Equity Plan, a copy of which is attached to the proxy statement/prospectus as Annex D, be adopted and approved."

Recommendation of the SOAC Board

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE INCENTIVE AWARD PLAN PROPOSAL.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

PROPOSAL NO. 7 — ADJOURNMENT PROPOSAL

The Adjournment Proposal allows the SOAC Board to submit a proposal to approve, by ordinary resolution, the adjournment of the extraordinary general meeting to a later date or dates (i) to the extent necessary to ensure that any required supplement or amendment to the accompanying proxy statement/prospectus is provided to SOAC shareholders or, if as of the time for which the extraordinary general meeting is scheduled, there are insufficient SOAC ordinary shares represented (either in person or by proxy) to constitute a quorum necessary to conduct business at the extraordinary general meeting or (ii) in order to solicit additional proxies from SOAC shareholders in favor of one or more of the proposals at the extraordinary general meeting. See "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*."

Consequences if the Adjournment Proposal is Not Approved

If the Adjournment Proposal is presented to the extraordinary general meeting and is not approved by the shareholders, the SOAC Board may not be able to adjourn the extraordinary general meeting to a later date in the event that, based on the tabulated votes, there are not sufficient votes at the time of the extraordinary general meeting to approve the Condition Precedent Proposals. In such events, the Business Combination would not be completed.

Vote Required for Approval

The approval of the Adjournment Proposal requires an ordinary resolution under Cayman Islands law, being the affirmative vote of at least a majority of the votes cast by the holders of the issued ordinary shares present in person or represented by proxy at the extraordinary general meeting and entitled to vote on such matter. Abstentions and broker non-votes, while considered present for the purposes of establishing a quorum, will not count as votes cast at the extraordinary general meeting, and otherwise will have no effect on the proposal.

The Adjournment Proposal is not conditioned on any other proposal.

Resolution

The full text of the resolution to be passed is as follows:

"**RESOLVED**, as an ordinary resolution, that the adjournment of the extraordinary general meeting to a later date or dates (A) to the extent necessary to ensure that any required supplement or amendment to the accompanying proxy statement/prospectus is provided to SOAC shareholders or, if as of the time for which the extraordinary general meeting is scheduled, there are insufficient SOAC ordinary shares represented (either in person or by proxy) to constitute a quorum necessary to conduct business at the extraordinary general meeting or (B) in order to solicit additional proxies from SOAC shareholders in favor of one or more of the proposals at the extraordinary general meeting be approved."

Recommendation of the SOAC Board

THE SOAC BOARD UNANIMOUSLY RECOMMENDS THAT SOAC SHAREHOLDERS VOTE "FOR" THE APPROVAL OF THE ADJOURNMENT PROPOSAL.

The existence of financial and personal interests of one or more of SOAC's directors may result in a conflict of interest on the part of such director(s) between what he or they may believe is in the best interests of SOAC and its shareholders and what he or they may believe is best for himself or themselves in determining to recommend that shareholders vote for the proposals. In addition, SOAC's officers have interests in the Business Combination that may conflict with your interests as a shareholder. See the section entitled "*Business Combination Proposal — Interests of SOAC's Directors and Executive Officers in the Business Combination*" for a further discussion of these considerations.

U.S. FEDERAL INCOME TAX CONSIDERATIONS

The following discussion is a summary of material U.S. federal income tax considerations applicable to you if you are a U.S. Holder (as defined below) of our public shares and/or public warrants (other than Sponsor or any of its affiliates), as a consequence of (i) the Continuance, (ii) electing to have your shares redeemed for cash pursuant to the redemption provisions described in the section entitled "*Extraordinary General Meeting of SOAC — Redemption Rights*" (a "Redemption"), and/or (iii) the ownership and disposition of TMC Common Shares and TMC's warrants after the Business Combination. This discussion addresses only those U.S. Holders that hold our public shares and/or public warrants as capital assets within the meaning of Section 1221 of the Code (generally property held for investment). This summary does not discuss all aspects of U.S. federal income taxation that may be relevant to particular investors in light of their particular circumstances, or to investors subject to special tax rules, such as:

- financial institutions;
- insurance companies;
- mutual funds;
- pension plans;
- S corporations;
- broker-dealers;
- traders in securities that elect mark-to-market treatment;
- regulated investment companies;
- real estate investment trusts;
- trusts and estates;
- tax-exempt organizations (including private foundations);
- investors that hold our public shares or public warrants or who will hold TMC Common Shares or TMC warrants as part of a "straddle," "hedge," "conversion," "synthetic security," "constructive ownership transaction," "constructive sale" or other integrated transaction for U.S. federal income tax purposes;
- investors subject to the alternative minimum tax provisions of the Code;
- U.S. Holders that have a functional currency other than the U.S. dollar;
- U.S. expatriates or former long-term residents of the United States;
- investors subject to the U.S. "inversion" rules;
- U.S. Holders owning or considered as owning (directly, indirectly, or through attribution) 5% (measured by vote or value) or more of our public share, or, following the Business Combination, TMC Common Shares;
- persons who purchase TMC Common Shares as part of the PIPE Financing;
- persons that acquired our public shares or public warrants or will acquire TMC Common Shares or TMC warrants pursuant to an exercise of employee share options, in connection with employee share incentive plans or otherwise as compensation as compensation;
- controlled foreign corporations;
- accrual method taxpayers that file applicable financial statements as described in Section 451(b) of the Code;

- passive foreign investment companies; and
- persons who are not U.S. Holders, all of whom may be subject to tax rules that differ materially from those summarized below.

This summary does not discuss any state, local, or non-U.S. tax considerations, any non-income tax (such as gift or estate tax) considerations, the alternative minimum tax or the Medicare tax on net investment income. In addition, this summary does not address any tax consequences to investors that directly or indirectly hold equity interests in DeepGreen prior to the Business Combination. With respect to the consequences of holding TMC Common Shares or TMC warrants, this discussion is limited to U.S. Holders who acquire such TMC Common Shares as a result and upon the consummation of the Continuance or as a result of the exercise of a TMC warrant.

If a partnership (including an entity or arrangement treated as a partnership for U.S. federal income tax purposes) holds public shares, public warrants, TMC Common Shares or TMC warrants, the tax treatment of a partner in such partnership will generally depend upon the status of the partner, the activities of the partnership and the partner and certain determinations made at the partner level. If you are a partner of a partnership holding public shares, public warrants, TMC Common Shares or TMC warrants, you are urged to consult your tax advisor regarding the tax consequences to you of the Continuance, a redemption and/or the ownership and disposition of TMC Common Shares and TMC warrants by the partnership.

This summary is based upon the Code, the regulations promulgated by the U.S. Treasury Department, current administrative interpretations and practices of the IRS, and judicial decisions, all as currently in effect and all of which are subject to differing interpretations or to change, possibly with retroactive effect. No assurance can be given that the IRS would not assert, or that a court would not sustain a position contrary to any of the tax considerations described below.

For purposes of this discussion, because any unit of SOAC consisting of Class A ordinary share and one-half (1/2) of one warrant to acquire one Class A ordinary share is separable at the option of the holder, SOAC is treating any Class A ordinary share and one-half (1/2) of one warrant to acquire one Class A ordinary share held by a U.S. Holder in the form of a single unit as separate instruments and is assuming that the unit itself will not be treated as an integrated instrument. Accordingly, the separation of a unit of SOAC in connection with the consummation of the Business Combination generally should not be a taxable event for U.S. federal income tax purposes. This position is not free from doubt, and no assurance can be given that the IRS would not assert, or that a court would not sustain, a contrary position. U.S. Holders of units of SOAC are urged to consult their tax advisors concerning the U.S. federal, state, local and any non-U.S. tax consequences of the Continuance and any redemption.

For purposes of this discussion, a "U.S. Holder" is a beneficial owner of public shares, public warrants, TMC Common Shares or TMC warrants, as the case may be, that is:

- an individual who is a U.S. citizen or resident of the United States;
- a corporation (including an entity treated as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States, any state thereof or the District of Columbia;
- an estate the income of which is includible in gross income for U.S. federal income tax purposes regardless of its source; or
- a trust (A) the administration of which is subject to the primary supervision of a U.S. court and which has one or more U.S. persons (within the meaning of the Code) who have the authority to control all substantial decisions of the trust or (B) that has in effect a valid election under applicable U.S. Department of Treasury regulations ("Treasury Regulations") to be treated as a U.S. person.

Tax Consequences for U.S. Holders Exercising Redemption Rights

If you are a U.S. Holder and elect to redeem some or all of your public shares in a Redemption, subject to the discussion below of the rules applicable to a "passive foreign investment company" (a "PFIC"), the treatment of the transaction for U.S. federal income tax purposes will generally depend on whether the Redemption qualifies as sale of the public shares under Section 302 of the Code that is taxable as described below under the heading "— *Taxable Sale or Exchange of Public Shares*," or rather as a distribution that is taxable as described below under

the heading "— *Taxation of Distributions*." Generally, whether the Redemption qualifies for sale or distribution treatment will depend largely on the total number of public shares treated as held by the U.S. Holder (including any shares constructively owned by the U.S. Holder as a result of owning SOAC warrants and taking into account any ownership in TMC Common Shares and/or TMC warrants immediately after the Business Combination) relative to all of our shares held or treated as held by the U.S. Holder immediately before such Redemption. A Redemption generally will be treated as a sale of our public shares (rather than as a distribution) if the Redemption (i) is "substantially disproportionate" with respect to the U.S. Holder, (ii) results in a "complete termination" of the U.S. Holder's interest in us or (iii) is "not essentially equivalent to a dividend" with respect to the U.S. Holder.

In determining whether any of the foregoing tests are satisfied, a U.S. Holder generally takes into account not only stock actually owned by the U.S. Holder, but also public shares that are constructively owned by it. A U.S. Holder may constructively own, in addition to stock owned directly, stock owned by certain related individuals and entities in which the U.S. Holder has an interest or that have an interest in such U.S. Holder, as well as any stock the U.S. Holder has a right to acquire by exercise of an option, which would generally include public shares which could be acquired pursuant to the exercise of any public warrants held by it (and, after the completion of the Business Combination, TMC Common Shares which could be acquired by exercise of the TMC warrants). In order to meet the substantially disproportionate test, the percentage of our outstanding voting stock (including the public shares and the TMC Common Shares received in exchange therefor) actually and constructively owned by the U.S. Holder immediately following the Redemption must, among other requirements, be less than 80% of such voting stock actually and constructively owned by the U.S. Holder immediately before the Redemption. There will be a complete termination of a U.S. Holder's interest if either (i) all of the public shares actually and constructively owned by the U.S. Holder are redeemed or (ii) all of the public shares actually owned by the U.S. Holder are redeemed, and the U.S. Holder is eligible to waive, and effectively waives in accordance with specific rules, the attribution of stock owned by certain family members, the U.S. Holder does not constructively own any other stock and certain other requirements are met. A Redemption will not be essentially equivalent to a dividend if a U.S. Holder's conversion results in a "meaningful reduction" of the U.S. Holder's proportionate interest in us. Whether the Redemption will result in a meaningful reduction in a U.S. Holder's proportionate interest in us will depend on the particular facts and circumstances. The IRS has indicated in a published ruling that even a small reduction in the proportionate interest of a small minority stockholder in a publicly held corporation who exercises no control over corporate affairs may constitute such a "meaningful reduction."

If none of the foregoing tests are satisfied, then the Redemption generally will be treated as a distribution and the tax effects will be as described below under "— *Taxation of Distributions*."

U.S. Holders of public shares considering exercising their Redemption rights are urged to consult their tax advisors to determine whether the Redemption would be treated as a sale or as a distribution under the Code.

Taxable Sale or Exchange of Public Shares

Subject to the discussion of the PFIC rules below, if any Redemption qualifies as a sale of a public share (rather than a distribution with respect to such public share), a U.S. Holder generally will recognize gain or loss in an amount equal to the difference between (i) the cash received in the Redemption and (ii) the U.S. Holder's adjusted tax basis in such public share. Any such gain or loss generally will be capital gain or loss and will be long-term capital gain or loss if the U.S. Holder's holding period for such public share exceeds one (1) year. A U.S. Holder's adjusted tax basis in a public share generally will equal the U.S. Holder's acquisition cost of such share (which, if such share was acquired as part of a unit, is the portion of the purchase price of the unit allocated to such share or, if such share was received upon exercise of a Public Warrant, the initial basis of the public share upon exercise of the Public Warrant (generally determined as described below in "— *Tax Consequences of Ownership and Disposition of TMC Common Shares and TMC Warrants — Exercise or Lapse of a TMC Warrant*")). Long-term capital gain realized by a non-corporate U.S. Holder generally will be taxable at a reduced rate. The deductibility of capital losses is subject to limitations.

Taxation of Distributions

Subject to the PFIC rules discussed below, if a Redemption is taxable as a distribution for U.S. federal income tax purposes, such distribution generally will be taxable as a dividend for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax

principles. Distributions in excess of our current and accumulated earnings and profits will constitute a return of capital that will be applied against and reduce (but not below zero) the U.S. Holder's adjusted tax basis in its public shares. Any remaining excess will be treated as gain realized on the sale or other disposition of the public shares and will be treated as described above under "— *Taxable Sale or Exchange of Public Shares*." Amounts treated as dividends that SOAC pays to a U.S. Holder that is a taxable corporation generally will be taxed at regular rates and will not qualify for the dividends received deduction generally allowed to domestic corporations in respect of dividends received from other domestic corporations. With respect to non-corporate U.S. Holders, under tax laws currently in effect and subject to certain exceptions (including, but not limited to, dividends treated as investment income for purposes of investment interest deduction limitations), dividends generally will be taxed at the lower applicable long-term capital gains rate only if (1) our public shares are readily tradable on an established securities market in the United States, (2) SOAC is not treated as a PFIC at the time the dividend was paid or in the preceding taxable year, and (3) certain holding period requirements are met.

PFIC Considerations

As discussed below under "— *Tax Consequences of Ownership and Disposition of TMC Common Shares and TMC Warrants — Passive Foreign Investment Company Rules*," SOAC (and following the Business Combination, TMC) is expected to be treated as a PFIC for U.S. federal income tax purposes. As a result, any income or gain recognized by a U.S. Holder electing to have its public shares redeemed would be subject to the special tax and interest charge under the PFIC rules (discussed further below) unless such U.S. Holder makes or has made either of the PFIC Elections (described below) for SOAC's first taxable year as a PFIC in which such U.S. Holder held (or was deemed to hold) such shares.

IF YOU ARE A HOLDER OF PUBLIC SHARES CONTEMPLATING EXERCISE OF YOUR REDEMPTION RIGHTS, WE URGE YOU TO CONSULT YOUR TAX ADVISOR CONCERNING THE U.S. FEDERAL, STATE, LOCAL, AND FOREIGN INCOME AND OTHER TAX CONSEQUENCES THEREOF.

Tax Consequences of the Continuance to U.S. Holders

The U.S. federal income tax consequences of the Continuance will depend primarily upon whether the Continuance qualifies as a "reorganization" within the meaning of Section 368 of the Code.

Under Section 368(a)(1)(F) of the Code, a reorganization is a "mere change in identity, form, or place of organization of one corporation, however effected." Pursuant to the Continuance, we will change our jurisdiction of incorporation by deregistering as an exempted company in the Cayman Islands and migrating to and continuing as a company in British Columbia, changing our name to "TMC the metals company Inc." It is intended that the Continuance qualify as reorganization under Section 368(a)(1)(F) of the Code (an "F reorganization") and the remainder of this discussion assumes that the Continuance so qualifies.

Assuming the Continuance qualifies as an F reorganization, (i) a U.S. Holder that exchanges its SOAC securities in the Continuance for TMC securities should not recognize any gain or loss on such exchange, (ii) the aggregate adjusted tax basis of the TMC securities received in the Continuance by a U.S. Holder should be equal to the adjusted tax basis of the SOAC securities surrendered in the Continuance in exchange therefor, and (iii) the holding period of the TMC securities should include the period during which the SOAC securities surrendered in the Continuance in exchange therefor were held, although the running of the holding period for the public shares may be suspended as a result of the redemption rights with respect thereto (as described above in this proxy statement/prospectus).

Tax Consequences of Ownership and Disposition of TMC Common Shares and TMC Warrants

Dividends and Other Distributions on TMC Common Shares

Subject to the PFIC rules discussed below under the heading "— *Passive Foreign Investment Company Rules*," distributions on TMC Common Shares will generally be taxable as a dividend for U.S. federal income tax purposes to the extent paid from TMC's current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Distributions in excess of TMC's current and accumulated earnings and profits will constitute a return of capital that will be applied against and reduce (but not below zero) the U.S. Holder's adjusted tax basis in its TMC Common Shares. Any remaining excess will be treated as gain realized on the sale or other disposition of the TMC

Common Shares and will be treated as described below under the heading "*— Sale, Taxable Exchange or Other Taxable Disposition of TMC Common Shares and TMC Warrants.*" The amount of any such distribution will include any amounts withheld by us (or another applicable withholding agent) in respect of Canadian income taxes. Any amount treated as dividend income will be treated as foreign-source dividend income. Amounts treated as dividends that TMC pays to a U.S. Holder that is a taxable corporation generally will be taxed at regular rates and will not qualify for the dividends received deduction generally allowed to U.S. corporations in respect of dividends received from other U.S. corporations. With respect to non-corporate U.S. Holders, under tax laws currently in effect and subject to certain exceptions (including, but not limited to, dividends treated as investment income for purposes of investment interest deduction limitations), dividends generally will be taxed at the lower applicable long-term capital gains rate only if TMC Common Shares are readily tradable on an established securities market in the United States or TMC is eligible for benefits under an applicable tax treaty with the United States, and TMC is not treated as a PFIC with respect to such U.S. Holder at the time the dividend was paid or in the preceding year and provided certain holding period requirements are met. The amount of any dividend distribution paid in Canadian dollars will be the U.S. dollar amount calculated by reference to the exchange rate in effect on the date of actual or constructive receipt, regardless of whether the payment is in fact converted into U.S. dollars at that time. A U.S. Holder may have foreign currency gain or loss if the dividend is converted into U.S. dollars after the date of receipt.

Subject to applicable limitations, non-refundable Canadian income taxes withheld from dividends on TMC Common Shares at a rate not exceeding the rate provided by the applicable treaty with the United States will be eligible for credit against the U.S. treaty beneficiary's (as defined below) U.S. federal income tax liability. The rules governing foreign tax credits are complex and U.S. Holders are urged to consult their tax advisers regarding the creditability of foreign taxes in their particular circumstances. In lieu of claiming a foreign tax credit, a U.S. Holder may deduct foreign taxes, including any Canadian income tax, in computing their taxable income, subject to generally applicable limitations under U.S. law. An election to deduct foreign taxes instead of claiming foreign tax credits applies to all foreign taxes paid or accrued in the taxable year.

Sale, Taxable Exchange or Other Taxable Disposition of TMC Common Shares and TMC Warrants

Subject to the PFIC rules discussed below under the heading "*— Passive Foreign Investment Company Rules,*" upon any sale, exchange or other taxable disposition of TMC Common Shares or TMC warrants, a U.S. Holder generally will recognize gain or loss in an amount equal to the difference between (i) the sum of (x) the amount cash and (y) the fair market value of any other property, received in such sale, exchange or other taxable disposition and (ii) the U.S. Holder's adjusted tax basis in such TMC Common Shares or TMC warrants, in each case as calculated in U.S. dollars. If a U.S. Holder acquired such TMC Common Shares or TMC warrants as part of a unit, the adjusted tax basis in the TMC Common Shares or TMC warrants will be the portion of the acquisition cost allocated to the shares or warrants, respectively, or if such TMC Common Shares were received upon exercise of TMC warrants, the initial basis of the TMC Common Shares upon exercise of TMC warrants (generally determined as described below in "*— Tax Consequences of Ownership and Disposition of TMC Common Shares and TMC Warrants — Exercise or Lapse of a Warrant*"). Any such gain or loss generally will be capital gain or loss and will be long-term capital gain or loss if the U.S. Holder's holding period for such TMC Common Shares exceeds one (1) year. Long-term capital gain realized by a non-corporate U.S. Holder generally will be taxable at a reduced rate. The deduction of capital losses is subject to limitations. This gain or loss generally will be treated as U.S. source gain or loss.

Exercise or Lapse of a TMC Warrant

A U.S. Holder generally will not recognize taxable gain or loss on the acquisition of a TMC Common Share upon exercise of a TMC warrant for cash. The U.S. Holder's tax basis in the TMC Common Share received upon exercise of the TMC warrant generally will be an amount equal to the sum of the U.S. Holder's initial investment in the TMC warrant (*i.e.*, its tax basis, calculated in U.S. dollars) and the exercise price. The U.S. Holder's holding period for a TMC Common Share received upon exercise of the of a TMC warrant will begin on the day following the date of exercise (or possibly the date of exercise) of the TMC warrant and will not include the period during which the U.S. Holder held the TMC warrant (or any public warrant exchanged therefor). If a TMC warrant is allowed to lapse unexercised, a U.S. Holder generally will recognize a capital loss equal to such U.S. Holder's tax basis in the warrant (calculated in U.S. dollars). Such loss will be long-term if the warrant has been held for more than one (1) year.

The tax consequences of a cashless exercise of a TMC warrant are not clear under current tax law. A cashless exercise may not be taxable, either because the exercise is not a realization event or because the exercise is treated as a recapitalization for U.S. federal income tax purposes. In either situation, a U.S. Holder's tax basis in the shares of TMC Common Shares received generally should equal the U.S. Holder's tax basis in the TMC warrants. If the cashless exercise was not a realization event, it is unclear whether a U.S. Holder's holding period for the TMC Common Shares would be treated as commencing on the date of exercise of the TMC warrant or the day following the date of exercise of the TMC warrant. If the cashless exercise were treated as a recapitalization, the holding period of the shares of TMC Common Shares received would include the holding period of the TMC warrant.

It is also possible that a cashless exercise may be treated in part as a taxable exchange in which gain or loss would be recognized. In such event, a U.S. Holder may be deemed to have surrendered a number of TMC warrants having a value equal to the exercise price for the total number of TMC warrants to be exercised. The U.S. Holder would recognize capital gain or loss in an amount equal to the difference between the fair market value of the TMC warrants deemed surrendered and the U.S. Holder's tax basis in the TMC warrants deemed surrendered. In this case, a U.S. Holder's tax basis in the shares of TMC Common Shares received would equal the sum of the U.S. Holder's tax basis in the TMC warrants exercised, and the exercise price of such TMC warrants. It is unclear whether a U.S. Holder's holding period for the shares of TMC Common Shares would commence on the date of exercise of the TMC warrant or the day following the date of exercise of the TMC warrant; in either case, the holding period will not include the period during which the U.S. Holder held the TMC warrant.

Due to the absence of authority on the U.S. federal income tax treatment of a cashless exercise, including when a U.S. Holder's holding period would commence with respect to the shares of TMC Common Shares received, there can be no assurance as to which, if any, of the alternative tax consequences and holding periods described above would be adopted by the IRS or a court of law. Accordingly, U.S. Holders are urged to consult their tax advisors regarding the tax consequences of a cashless exercise.

If TMC redeems TMC warrants for cash or if TMC purchases TMC warrants in an open market transaction, such redemption or purchase generally will be treated as a taxable disposition to the U.S. Holder, taxed as described above under "*— Sale, Taxable Exchange or Other Taxable Disposition of TMC Common Shares and TMC Warrants*."

Adjustment to Exercise Price

Under Section 305 of the Code, if certain adjustments are made (or not made) to the number of shares to be issued upon the exercise of a TMC warrant or to the TMC warrant's exercise price, a U.S. Holder may be deemed to have received a constructive distribution with respect to the warrant, which could result in adverse consequences for the U.S. Holder, including the inclusion of dividend income (with the consequences generally as described above under the heading "*— Dividends and Other Distributions on TMC Common Shares*"). The rules governing constructive distributions as a result of certain adjustments with respect to a TMC warrant are complex, and U.S. Holders are urged to consult their tax advisors on the tax consequences any such constructive distribution with respect to a TMC warrant.

Passive Foreign Investment Company Rules

The treatment of U.S. Holders of TMC Common Shares and TMC warrants could be materially different from that described above if TMC is treated as a passive foreign investment company ("PFIC") for U.S. federal income tax purposes. For purposes of the PFIC rules, assuming the Continuance qualifies as an F Reorganization, TMC is expected be treated as the same corporation as SOAC.

If SOAC (and following the Business Combination, TMC) is a PFIC for any taxable year, U.S. Holders of public shares or public warrants may be subject to adverse U.S. federal income tax consequences with respect to dispositions of, and distributions with respect to SOAC's stock, and may be subject to additional reporting requirements.

A non-U.S. corporation will be classified as a PFIC for U.S. federal income tax purposes if either (i) at least 75% of its gross income in a taxable year, including its pro rata share of the gross income of any corporation in which it is considered to own at least 25% of the shares by value, is passive income (the "Income Test") or (ii) at least 50% of its assets in a taxable year (ordinarily determined based on fair market value and averaged quarterly over the year), including its pro rata share of the assets of any corporation in which it is considered to own at least

25% of the shares by value, are held for the production of, or produce, passive income (the "Asset Test"). Passive income generally includes dividends, interest, rents and royalties (other than rents or royalties derived from the active conduct of a trade or business) and gains from the disposition of passive assets.

Because SOAC is a blank-check company with no current active business, based upon the composition of SOAC's income and assets, SOAC believes that it likely met the Income Test and the Asset Test for PFIC classification in 2020. In addition, based on the expected operations, and composition of income of TMC and its subsidiaries after the Business Combination, SOAC (and after the Business Combination, TMC) expects that it will meet the Income Test for PFIC classification in 2021, therefore, it is expected that TMC will be treated as a PFIC for the taxable year that includes the Business Combination. However, SOAC and TMC's actual PFIC status for any taxable year will not be determinable until after the end of such year. Accordingly, there can be no assurance with respect to SOAC's status as a PFIC for 2020, and, there can be no assurances with respect to TMC's status as a PFIC for the current or any future taxable year. Although PFIC status is generally determined annually, if SOAC (and following the Business Combination, TMC) is determined to be a PFIC for any taxable year (or portion thereof) that is included in the holding period of a U.S. Holder of public shares or TMC Common Shares and the U.S. Holder did not make either a qualifying electing fund ("QEF") election or a mark-to-market election (collectively, the "PFIC Elections") for the first taxable year of SOAC or TMC in which it was treated as a PFIC, and in which the U.S. Holder held (or was deemed to hold) such shares, or such U.S. Holder does not otherwise make an applicable purging election described below, such U.S. Holder generally will be subject to special and adverse rules with respect to (i) any gain recognized by the U.S. Holder on the sale or other disposition of its TMC Common Shares and (ii) any "excess distribution" made to the U.S. Holder (generally, any distributions to such U.S. Holder during a taxable year of the U.S. Holder that are greater than 125% of the average annual distributions received by such U.S. Holder in respect of the TMC Common Shares during the three preceding taxable years of such U.S. Holder or, if shorter, such U.S. Holder's holding period for the TMC Common Shares).

Under these rules:

- the U.S. Holder's gain or excess distribution will be allocated ratably over the U.S. Holder's holding period for the TMC Common Shares;
- the amount allocated to the U.S. Holder's taxable year in which the U.S. Holder recognized the gain or received the excess distribution, and to any period in the U.S. Holder's holding period before the first day of TMC's first taxable year in which TMC is a PFIC, will be taxed as ordinary income;
- the amount allocated to other taxable years (or portions thereof) of the U.S. Holder and included in its holding period will be taxed at the highest tax rate in effect for that year and applicable to the U.S. Holder; and
- an additional tax equal to the interest charge generally applicable to underpayments of tax will be imposed on the U.S. Holder with respect to the tax attributable to each such other taxable year of the U.S. Holder.

PFIC Elections

In general, if TMC is determined to be a PFIC, a U.S. Holder may avoid the adverse PFIC tax consequences described above in respect of TMC Common Shares by making and maintaining a timely and valid QEF election (if eligible to do so) to include in income its pro rata share of TMC's net capital gains (as long-term capital gain) and other earnings and profits (as ordinary income), on a current basis, in each case whether or not distributed, in the first taxable year of the U.S. Holder in which or with which TMC's taxable year ends and each subsequent taxable year. A U.S. Holder generally may make a separate election to defer the payment of taxes on undistributed income inclusions under the QEF rules, but if deferred, any such taxes will be subject to an interest charge.

In order to comply with the requirements of a QEF election, a U.S. Holder must receive a PFIC Annual Information Statement from us. If TMC determines that it is a PFIC, TMC intends to provide the information necessary for U.S. Holders to make or maintain a QEF election, including information necessary to determine the appropriate income inclusion amounts for purposes of the QEF election. However, there is also no assurance that TMC will have timely knowledge of its status as a PFIC in the future or of the required information to be provided.

Alternatively, if TMC is a PFIC and TMC Common Shares constitute "marketable stock," a U.S. Holder may avoid the adverse PFIC tax consequences discussed above if such U.S. Holder makes a mark-to-market election with respect to such shares for the first taxable year in which it holds (or is deemed to hold) TMC Common Shares and each subsequent taxable year. Such U.S. Holder generally will include for each of its taxable years as ordinary income the excess, if any, of the fair market value of its TMC Common Shares at the end of such year over its adjusted basis in its TMC Common Shares. The U.S. Holder also will recognize an ordinary loss in respect of the excess, if any, of its adjusted basis of its TMC Common Shares over the fair market value of its TMC Common Shares at the end of its taxable year (but only to the extent of the net amount of previously included income as a result of the mark-to-market election). The U.S. Holder's basis in its TMC Common Shares will be adjusted to reflect any such income or loss amounts, and any further gain recognized on a sale or other taxable disposition of its TMC Common Shares will be treated as ordinary income. Currently, a mark-to-market election may not be made with respect to TMC warrants.

The mark-to-market election is available only for "marketable stock," generally, stock that is regularly traded on a national securities exchange that is registered with the Securities and Exchange Commission, including the NASDAQ (on which TMC Common Shares are intended to be listed), or on a foreign exchange or market that the IRS determines has rules sufficient to ensure that the market price represents a legitimate and sound fair market value. If made, a mark-to-market election would be effective for the taxable year for which the election was made and for all subsequent taxable years unless the TMC Common Shares cease to qualify as "marketable stock" for purposes of the PFIC rules or the IRS consents to the revocation of the election. U.S. Holders are urged to consult their tax advisors regarding the availability and tax consequences of a mark-to-market election with respect to TMC Common Shares under their particular circumstances.

The application of the PFIC rules to TMC warrants is unclear. A proposed Treasury Regulation issued under these rules generally treats an "option" (which would include a Public Warrant) to acquire the stock of a PFIC as stock of the PFIC, while a final Treasury Regulation issued under these rules provides that the holder of an option is not entitled make the PFIC Elections. Another proposed Treasury Regulation provides that for purposes of the PFIC rules, stock acquired upon the exercise of an option will be deemed to have a holding period that includes the period the U.S. Holder held the TMC warrants. As a result, if the proposed Treasury Regulations were to apply, and a U.S. Holder were to sell or otherwise dispose of such TMC warrants (other than upon exercise of such TMC warrants for cash) and TMC was a PFIC at any time during the U.S. Holder's holding period of such TMC warrants, any gain recognized generally would be treated as an excess distribution, taxed as described above. If a U.S. Holder that exercises such TMC warrants properly makes and maintains a QEF election with respect to the newly acquired TMC Common Shares (or has previously made a QEF election with respect to TMC Common Shares, or public shares, as applicable), the QEF election will apply to the newly acquired TMC Common Shares. Notwithstanding such QEF election, if the proposed Treasury Regulations were to apply, the adverse tax consequences relating to PFIC shares, adjusted to take into account the current income inclusions resulting from the QEF election, would continue to apply with respect to such newly acquired TMC Common Shares (which generally will be deemed to have a holding period for purposes of the PFIC rules that includes the period the U.S. Holder held the TMC warrants), unless the U.S. Holder makes a purging election under the PFIC rules described in the following paragraph.

If TMC is treated as a PFIC and a U.S. Holder failed or was unable to timely make a PFIC Election for prior periods, a U.S. Holder might seek make a purging election to rid the TMC Common Shares of the PFIC taint. A purging election might be desirable if, for example, a U.S. Holder misses the deadline for filing a QEF election for a prior period, or if the TMC Common Shares were acquired through the exercise of TMC warrants with a holding period that includes the period the warrants were held, either as a result of the application of the proposed Treasury Regulations, or because the TMC Common Shares are acquired through a cashless exercise that is treated as a recapitalization. Under one type of purging election, the U.S. Holder will be deemed to have sold such shares at their fair market value and any gain recognized on such deemed sale will be treated as an excess distribution, as described above. Under another type of purging election, TMC will be deemed to have made a distribution to the U.S. Holder of such U.S. Holder's pro rata share of TMC's earnings and profits as determined for U.S. federal income tax purposes. In order for the U.S. Holder to make the second election, TMC must also be determined to be a "controlled foreign corporation" as defined by the Code (which is not currently expected to be the case). As a result of either purging election, the U.S. Holder will have a new basis and holding period in the TMC Common Shares acquired upon the exercise of the TMC warrants solely for purposes of the PFIC rules.

The QEF election is made on a shareholder-by-shareholder basis and, once made, can be revoked only with the consent of the IRS. A U.S. Holder generally makes a QEF election by attaching a completed IRS Form 8621 (Information Return by a Shareholder of a Passive Foreign Investment Company or Qualified Electing Fund), including the information provided in a PFIC Annual Information Statement, to a timely filed U.S. federal income tax return for the tax year to which the election relates. Retroactive QEF elections generally may be made only by filing a protective statement with such return and if certain other conditions are met or with the consent of the IRS. U.S. Holders are urged to consult their tax advisors regarding the availability and tax consequences of a retroactive QEF election under their particular circumstances.

Related PFIC Rules

If TMC is a PFIC and, at any time, has a foreign subsidiary that is classified as a PFIC, a U.S. Holder generally would be deemed to own a proportionate amount of the shares of such lower-tier PFIC, and generally could incur liability for the deferred tax and interest charge described above if TMC receives a distribution from, or disposes of all or part of its interest in, the lower-tier PFIC, or the U.S. Holder otherwise was deemed to have disposed of an interest in the lower-tier PFIC. In certain circumstances, a U.S. Holder may make a QEF election with respect to any lower-tier PFIC.

A U.S. Holder that owns (or is deemed to own) shares in a PFIC during any taxable year of the U.S. Holder, may have to file an IRS Form 8621 (whether or not a QEF or mark-to-market election is made) and to provide such other information as may be required by the U.S. Treasury Department. Failure to do so, if required, will extend the statute of limitations applicable to such U.S. Holder until such required information is furnished to the IRS.

The rules dealing with PFICs and with the QEF and mark-to-market elections are very complex and are affected by various factors in addition to those described above. Accordingly, U.S. Holders of TMC Common Shares and TMC warrants are urged to consult their own tax advisors concerning the application of the PFIC rules to TMC securities under their particular circumstances.

Information Reporting and Backup Withholding

Payments of dividends and sales proceeds that are made within the United States or through certain U.S.-related financial intermediaries are subject to information reporting, and may be subject to backup withholding, unless (i) the U.S. Holder is a corporation or other exempt recipient or (ii) in the case of backup withholding, the U.S. Holder provides a correct taxpayer identification number and certifies that it is not subject to backup withholding.

The amount of any backup withholding from a payment to a U.S. Holder will be allowed as a credit against the holder’s U.S. federal income tax liability and may entitle it to a refund, provided that the required information is timely furnished to the IRS.

The U.S. federal income tax discussion set forth above is included for general information only and may not be applicable to you depending upon your particular situation. You are urged to consult your own tax advisor with respect to the tax consequences to you of the disposition of our public shares or public warrants As a result and upon the consummation of the Continuance and of the acquisition, ownership and disposition of TMC Common Shares and TMC warrants including the tax consequences under state, local, estate, foreign and other tax laws and tax treaties and the possible effects of changes in U.S. or other tax laws.

COMPARISON OF CORPORATE GOVERNANCE AND SHAREHOLDER RIGHTS

SOAC is an exempted company incorporated under the Cayman Islands Companies Law. The Cayman Islands Companies Law, Cayman Islands law generally and the Existing Governing Documents govern the rights of its shareholders. The Cayman Islands Companies Law and Cayman Islands law generally differs in some material respects from laws generally applicable to British Columbia companies and their shareholders. In addition, the Existing Governing Documents differ in certain material respects from the TMC Notice and Articles. As a result, when you become a shareholder of TMC, your rights will differ in some regards as compared to when you were a shareholder of SOAC.

Below is a summary chart outlining important similarities and differences in the corporate governance and shareholder rights associated with each of SOAC and TMC according to applicable law and/or the organizational documents of SOAC and TMC. You also should review the TMC Notice and Articles attached as Annex B and Annex C to this proxy statement/prospectus, as well as the BCBCA and corporate laws of the Cayman Islands, including the Cayman Islands Companies Law, to understand how these laws apply to SOAC and TMC.

	British Columbia	**Cayman Islands**
Shareholder Approval of Business Combinations	Under the BCBCA, amalgamations (other than short form amalgamations) generally must be approved by either a special resolution (being a resolution passed by no less than 66⅔% of the votes cast on the resolution at a meeting of shareholders) of the shareholders of the company or a unanimous resolution of the shareholders of the Company, and may require a special separate resolution of certain class or series of shares. Each share of an amalgamating company carries the right to vote on an amalgamation, whether or not that share otherwise carries the right to vote. A British Columbia company may also be acquired through a "plan of arrangement" approved by the Supreme Court of British Columbia and approved by a special resolution of the shareholders in attendance and voting at a shareholders' meeting. Each share carries the right to vote on an arrangement, whether or not that share otherwise carries the right to vote. Approval of a "plan of arrangement" may also require additional approvals including a special separate resolution of shares of a class or series of shares of a company, or a special separate resolution of certain shareholders, or other approvals required by the BCBCA or the court. The BCBCA provides a right of compulsory acquisition for an offeror that acquires 90% of the target securities pursuant to a takeover bid or issuer bid, other than securities held at the date of the bid by or on behalf of the offeror or its affiliate.	Statutory mergers require a special resolution, and any other authorization as may be specified in the relevant articles of association. Parties holding certain security interests in the constituent companies must also consent. All statutory mergers (other than parent/subsidiary mergers) require shareholder approval — there is no exception for smaller mergers. Where a bidder has acquired at least 90% of the shares to which a takeover offer relates, it can compulsorily acquire the shares of the remaining shareholders and thereby become the sole shareholder. A Cayman Islands company may also be acquired through a "scheme of arrangement" sanctioned by a Cayman Islands court and approved by a majority in number representing 75% in value of shareholders present, in person or by proxy, at a shareholders meeting.

	British Columbia	Cayman Islands
Shareholder Votes for Routine Matters	Under the BCBCA and TMC's Notice and Articles, routine corporate matters may be approved by an ordinary resolution, unless otherwise required by the BCBCA. An ordinary resolution of shareholders may be passed (a) by a simple majority of the votes cast on the resolution at a meeting of the shareholders or (b) by being consented to in writing by shareholders holding shares that carry at least two-thirds of the votes entitled to be cast on the resolution, provided that the resolution has been submitted to all shareholders holding shares that carry the right to vote at general meetings.	Under Cayman Islands law and the Existing Governing Documents, routine corporate matters may be approved by an ordinary resolution (being a resolution passed by a simple majority of the shareholders as being entitled to do so).
Shareholder Votes for Extraordinary Transactions	Under the BCBCA, certain extraordinary corporate actions, such as certain amalgamations, continuances and sales, leases or other disposals of all or substantially all of a company's undertaking other than in the ordinary course of business, liquidations, dissolutions, and arrangements, are required to be approved by special resolution of the shareholders of the company. In certain cases, a special resolution to approve an extraordinary corporate action is also required to be approved separately by the holders of a class or series of shares, including in certain cases a class or series of shares not otherwise carrying voting rights.	Cayman Islands law does not contain equivalent statutory provisions.
Amendments to Governing Documents	Under the BCBCA and TMC's Notice and Articles, certain amendments to the articles require the approval by an ordinary resolution. Certain amendments may require approval by a special resolution, which requires approval of not less than two-thirds of the votes cast by shareholders voting shares that carry the right to vote at general meetings at a meeting of shareholders, and may also require the separate approval of certain classes of shares. For example, if the amendment is of a nature that prejudices or interferes with the rights or special rights attached to a particular class or series, that class or series is entitled to vote separately as a class or series on the amendment whether or not it otherwise carries the right to vote. Certain amendments to the articles will only require approval by the directors.	Under Cayman Islands law, amendments to governing documents require the approval by shareholders of a special resolution.

	British Columbia	Cayman Islands
Appraisal Rights	Pursuant to the BCBCA, shareholders who dissent to certain actions being taken by a company may exercise a right of dissent and require the company to purchase the shares held by such shareholder at the fair value of such shares. A right of dissent is for example available where the company proposes or is subject to: • alter the restrictions on the powers of the company or on the business it is permitted to carry on; • amalgamate with another company (other than with certain affiliated companies); • sell, lease or exchange all or substantially all of the company's undertaking other than in the ordinary course of business; • continue into the laws of another jurisdiction; • undertake an arrangement, if the applicable order for the arrangement provides dissent rights; or • any court order that permits dissent.	Minority shareholders that dissent from a Cayman Islands statutory merger are entitled to be paid the fair market value of their shares, which if necessary may ultimately be determined by the court.
Inspection of Books and Records	Under the BCBCA, directors, current and former shareholders and, in certain circumstances, any other person, after giving the required notice, may examine certain of the records of a company, including the central securities registers, the register of directors and the minutes of meeting of the shareholders, during usual business hours and request copies of extracts.	Shareholders generally do not have any rights to inspect or obtain copies of the register of shareholders or other corporate records of a company.
Shareholder Lawsuits	Under the BCBCA, a shareholder, or other complainant recognized under the BCBCA, may apply to the court for leave to bring an action in the name of and on behalf of the company, or to defend a legal proceeding brought against the company, for the purpose of prosecuting, defending or discontinuing the action on behalf of the company.	In the Cayman Islands, the decision to institute proceedings on behalf of a company is generally taken by the company's board of directors. A shareholder may be entitled to bring a derivative action on behalf of the company, but only in certain limited circumstances.

	British Columbia	Cayman Islands
	Under the BCBCA, no action may be brought and no intervention in an action may be made unless a court is satisfied that: (i) the complainant has made reasonable efforts to cause the directors of the company to prosecute or defend the action; (ii) notice of the application has been given to the company and to any person the court may order; (iii) the complainant is acting in good faith; and (iv) it appears to the court that it is in the best interests of the company that the action be prosecuted or defended. Under the BCBCA, the court may make any order it thinks fit including: (a) an order authorizing the complainant or any other person to control the conduct of the action; (b) an order giving directions for the conduct of the action; and (c) an order requiring the company to pay the costs incurred by the complainant in connection with the action.	
Oppression Remedy	The BCBCA provides an oppression remedy to a shareholder (among others) that enables a court to make any order, both interim and final, with a view to remedying or bringing an end to the matters complained of, if the court is satisfied upon application of a complainant that: (i) that the affairs of the company are being or have been conducted, or that the powers of the directors are being or have been exercised, in a manner oppressive to one or more of the shareholders, including the applicant, or (ii) that some act of the company has been done or is threatened, or that some resolution of the shareholders or of the shareholders holding shares of a class or series of shares has been passed or is proposed, that is unfairly prejudicial to one or more of the shareholders, including the applicant.	There are very limited statutory minority shareholder protections under Cayman Islands law. Aggrieved minority shareholders looking for a remedy may bring a just and equitable winding up petition before the Cayman Islands court.
Fiduciary Duties of Directors	Under the BCBCA, in exercising their powers and discharging their duties, directors and officers must act honestly and in good faith, with a view to the best interests of the company, and exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances.	A director owes fiduciary duties to a company, including to exercise loyalty, to avoid conflicts of interest, honesty and good faith to the company as a whole. In addition to fiduciary duties, directors owe a duty of care, diligence and skill. Such duties are owed to the company but may be owed direct to creditors or shareholders in certain limited circumstances.

	British Columbia	Cayman Islands
Conflicts of Interests of Directors	Under the BCBCA, a director or senior officer of a company is liable to account to the company for any profit that accrues to the director or senior officer under or as a result of a contract or transaction in which the director or officer holds a disclosable interest, unless otherwise provided for in the BCBCA. A proposed contract or a proposed transaction, including related negotiations, is considered a contract or transaction. A director or a senior officer holds a disclosable interest in any contract or transaction that is material to the company and in which: (i) the director or officer has a material interest or (ii) in which a corporation has a material interest and the director or senior officer is a director or officer of that corporation or the director or senior officer has a material interest in that corporation, unless otherwise provided for in the BCBCA. A director or senior officer is not liable to account for and may retain the profits from a material contract or transaction in which he or she has a disclosable interest in certain circumstances. For example, a director or senior officer will not be liable to account for profits: (a) if the director or senior officer discloses the nature and extent of any material interest he or she has in a material contract or transaction to which the company is a party and the directors (other than the interested director(s)) approve the contract or transaction, even if the contract or transaction is one that does not normally require approval by the board of directors, provided that not all of the directors have a disclosable interest; or (b) if the contract or transaction is approved by special resolution of the voting shareholders after the required disclosure is made to the shareholders.	As part of the fiduciary duties owed, the general rule is that a director must not put himself in a position where there is an actual or potential conflict between a personal interest or duties owed to third parties and his duty to the company.

British Columbia	Cayman Islands
A director or senior officer does not have a disclosable interest in a contract or transaction in certain circumstances, including (i) if the contract or transaction relates primarily to the remuneration of the director or senior officer in that person's capacity as director, officer, employee or mandatory of the company or an affiliate of the company, (ii) if the contract or transaction is for indemnity or liability insurance under the BCBCA, or (iii) if the contract or transaction is with or for the benefit of an affiliate of the company, and the sole interest of the director is as a director or officer of the affiliate. If a director or officer does not disclose his or her interest in accordance with the BCBCA, or (in the case of a director) votes in respect of a resolution on a contract or transaction in which he or she is interested contrary to the BCBCA, the company or a shareholder may ask the court to enjoin the company from entering into the contract or transaction and to require the director or officer to account to the company for any profit that accrues to the director or officer as a result of the contract or transaction, according to the conditions the court considers appropriate. However, the above remedies only apply if the court determines that the contract or transaction was not fair and reasonable to the company.	

	British Columbia	Cayman Islands
Indemnification of Directors and Officers	Under the BCBCA, a company may indemnify: (i) a current or former director or officer of that company; (ii) a current or former director or officer of another company if, at the time such individual held such office, such company was an affiliate of the company, or if such individual held such office at the company's request; or (iii) an individual who, at the request of the company, held, or holds, an equivalent position in another entity (an "indemnifiable person") against all judgments, penalties or fines, or amounts paid to settle a proceeding in which he or she is involved because of that person's position as an indemnifiable person (an "eligible proceeding"), unless: (i) the individual did not act honestly and in good faith with a view to the best interests of such company or the other entity, as the case may be; or (ii) in the case of an eligible proceeding other than a civil proceeding, the individual did not have reasonable grounds for believing that the individual's conduct in respect of which the proceeding was brought was lawful. A company cannot indemnify an indemnifiable person if it is prohibited from doing so under its articles or by applicable law.	A Cayman Islands company generally may indemnify its directors or officers except with regard to fraud or willful default.
Limited Liability of Directors	Under the BCBCA, directors, officers, and employees of companies remain protected from personal liability unless it can be shown that their actions are tortious or exhibit an identity separate from that of the company so as to make the act or conduct complained of their own. At common law, courts can impose liability on a director if they are found in breach of any of the aforementioned fiduciary obligations. At common law, courts can also hold directors personally liable for corporate actions should they have resulted from the negligence of the director or negligent misrepresentation to a third party by a director. Generally, court will not interfere in management decisions in the absence of fraud or illegality and directors and officers will not be held to be in breach of their duty of care if they acted prudently and on a reasonably informed basis.	Liability of directors may be limited, except with regard to their own fraud or willful default.

DESCRIPTION OF TMC SECURITIES

The following summary of certain provisions of TMC securities does not purport to be complete and is subject to the TMC Notice and Articles and the provisions of applicable law, including the BCBCA. Copies of the form of TMC Notice and Articles is attached to this proxy statement/prospectus as Annex B and Annex C.

Authorized Share Capital

Following the Continuance, TMC's authorized share capital will consist of (a) an unlimited number of TMC Common Shares, (b) an unlimited number of preferred shares, issuable in series, (c) 5,000,000 Class A Special Shares, (d) 10,000,000 Class B Special Shares, (e) 10,000,000 Class C Special Shares, (f) 20,000,000 Class D Special Shares, (g) 20,000,000 Class E Special Shares, (h) 20,000,000 Class F Special Shares, (i) 25,000,000 Class G Special Shares, (j) 25,000,000 Class H Special Shares, (k) 500,000 Class I Special Shares and (l) 741,000 Class J Special Shares, each without par value. Following the Continuance, 37,500,000 TMC Common Shares, no preferred shares and no TMC Special Shares will be outstanding.

At the Effective Time, (a) 300,389,000 TMC Common Shares (assuming an Adjusted Equity Value immediately prior to the Effective Time (as defined below) of approximately $2.3 billion), (b) no preferred shares, (c) 5,000,000 Class A Special Shares, (d) 10,000,000 Class B Special Shares, (e) 10,000,000 Class C Special Shares, (f) 20,000,000 Class D Special Shares, (g) 20,000,000 Class E Special Shares, (h) 20,000,000 Class F Special Shares, (i) 25,000,000 Class G Special Shares, (j) 25,000,000 Class H Special Shares, (k) 500,000 Class I Special Shares and (l) 741,000 Class J Special Shares will be either outstanding or subject to issuance upon exercise of outstanding options, assuming no SOAC shareholders exercise redemption rights with respect to their public shares.

TMC Common Shares

Holders of TMC Common Shares will be entitled to one (1) vote per share on all matters upon which holders of shares are entitled to vote. Subject to the BCBCA and prior rights of the holders of TMC's preferred shares and any other class ranking senior to the Common Shares, the holders of TMC Common Shares are entitled to receive dividends as, if and when declared by the TMC Board. Subject to the prior payment to the holders of TMC Special Shares and TMC's preferred shares, TMC Special Shares, and any other class ranking senior to the Common Shares, in the event of TMC's liquidation, dissolution or winding-up or other distribution of its assets among its shareholders, the holders of TMC Common Shares will be entitled to share *pro rata* in the distribution of the balance of TMC's assets. Holders of TMC Common Shares will have no pre-emptive or conversion or exchange rights or other subscription rights. There are no redemption, retraction, purchase for cancellation or surrender provisions or sinking or purchase fund provisions applicable to TMC Common Shares. There is no provision in TMC's Notice and Articles requiring holders of TMC Common Shares to contribute additional capital, or permitting or restricting the issuance of additional securities or any other material restrictions. The special rights or restrictions attached to TMC Common Shares are subject to and may be adversely affected by, the rights attached to any series of preferred shares that the TMC Board may designate in the future.

Preferred Shares

Following the Continuance, TMC will be authorized to issue an unlimited number of preferred shares, issuable in series. Accordingly, the TMC Board will be authorized, without shareholder approval but subject to the provisions of the BCBCA, to determine the maximum number of shares of each series, create an identifying name for each series and attach such special rights or restrictions, including dividend, liquidation and voting rights, as the TMC Board may determine, and such special rights or restrictions, including dividend, liquidation and voting rights, may be superior to those of TMC Common Shares. The issuance of preferred shares, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or discouraging potential acquisition proposals and might adversely affect the market price of TMC Common Shares and the voting and other rights of the holders of TMC Common Shares. We have no current plan to issue any preferred shares.

TMC Special Shares

Holders of TMC Special Shares will not be entitled to any voting rights, except as required under the BCBCA in certain circumstances, and will not be entitled to receive dividends from TMC. Subject to the prior payment to the holders of TMC's preferred shares, in the event of TMC's liquidation, dissolution or winding-up or other

distribution of its assets among its shareholders, the holders of TMC Special Shares will be entitled to receive an amount equal to $0.00000000001 per TMC Special Share (the "Redemption Price"). Holders of TMC Special Shares will have no pre-emptive or exchange rights or other subscription rights. There is no provision in TMC's Notice and Articles requiring holders of TMC Special Shares to contribute additional capital. The special rights or restrictions attached to TMC Special Shares are subject to and may be adversely affected by, the rights attached to any series of preferred shares that the TMC Board may designate in the future. TMC's Notice and Articles will provide that the TMC Special Shares may not be, directly or indirectly, sold, transferred, pledged, mortgaged, exchanged, hypothecated or encumbered without the prior approval of the TMC Board, which shall only be given under certain circumstances specified in the TMC Notice and Articles (a "Permitted Transfer"). Notwithstanding the foregoing, any holder of TMC Special Shares may, at any time, provide an irrevocable direction and agreement in favor of TMC that a proposed transfer may not be a Permitted Transfer and that irrevocable direction may provide that any other Permitted Transfer shall require that the transferee provide an identical type of irrevocable direction and agreement.

Subject to the provisions of the BCBCA, any TMC Special Shares then outstanding shall be redeemed by TMC without any action on the part of the holders of TMC Special Shares (i) at any time after the 15th year anniversary of the original issue date of the TMC Special Shares or (ii) at any time after a Change of Control of TMC, in each case at the Redemption Price. For the purposes of TMC's Notice and Articles, "Change of Control" shall mean any transaction or series of related transactions (x) under which any person or one or more persons that are affiliates or that are acting as a "group" (as defined in Section 13(d)(3) of the Exchange Act), directly or indirectly, acquires or otherwise purchases (i) TMC or (ii) all or a material portion of assets, businesses or TMC's Equity Securities (as defined below) or (y) that results, directly or indirectly, in the shareholders of TMC as of immediately prior to such transaction holding, in the aggregate, less than 50% of the voting Equity Securities of TMC immediately after the consummation thereof (excluding, for the avoidance of doubt, any TMC Special Shares and the TMC Common Shares issuable upon conversion thereof) (in the case of each of clause (x) and (y), whether by amalgamation, merger, consolidation, arrangement, tender offer, recapitalization, purchase or issuance of Equity Securities or otherwise), and "Equity Securities" shall refer to TMC Common Shares, the preferred shares, TMC Special Shares or any other class of shares or series thereof in the capital of the Company or similar interest in the Company (including any stock appreciation, phantom stock, profit participation or similar rights), and any option, warrant, right or security (including debt securities) convertible, exchangeable or exercisable therefor.

The TMC Special Shares will automatically convert into TMC Common Shares on a one (1) for one (1) basis (the "Conversion Rate") (unless adjusted as described below) upon the occurrence of the following events:

- in the case of the Class A Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $15.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $15.00 per TMC Common Share;

- in the case of the Class B Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $25.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $25.00 per TMC Common Share;

- in the case of the Class C Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $35.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $35.00 per TMC Common Share;

- in the case of the Class D Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $50.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $50.00 per TMC Common Share;

- in the case of the Class E Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $75.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $75.00 per TMC Common Share;

- in the case of the Class F Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $100.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $100.00 per TMC Common Share;

- in the case of the Class G Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $150.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $150.00 per TMC Common Share;

- in the case of the Class H Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $200.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $200.00 per TMC Common Share;

- in the case of the Class I Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $50.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $50.00 per TMC Common Share; and

- in the case of the Class J Special Shares, if (a) on any twenty (20) trading days within any thirty (30) trading day period, the TMC Common Shares trade on the principal securities exchange or securities market on which TMC Common Shares are then traded for a price that is greater than or equal to $12.00, or (b) there occurs any transaction resulting in a Change of Control with a valuation of the TMC Common Shares that is greater than or equal to $12.00 per TMC Common Share.

No fractional TMC Common Share will be issued upon the conversion of the TMC Special Shares and no payment will be made to the holders of TMC Special Shares in lieu thereof. Rather, the holders of TMC Special Shares shall be entitled to the number of TMC Common Shares determined by rounding the entitlement down to the nearest whole number.

In the event that the TMC Common Shares are at any time sub-divided, consolidated, converted or exchanged for a greater or lesser number of shares of the same or another class, then appropriate adjustments will be made in the rights and conditions attaching to the TMC Special Shares so as to preserve in all respects the benefits of the holders of TMC Special Shares.

In the event of any merger, amalgamation, consolidation, arrangement, reorganization or other business combination involving TMC with another entity, other than a Change of Control, the holders of TMC Special Shares will be entitled to receive, on conversion, such securities or other property as if on the effective date of the event they were registered holders of the number of TMC Common Shares which such holders of TMC Special Shares were entitled to receive upon conversion of their TMC Special Shares.

Warrants

TMC Public Warrants

Upon the Continuance, each TMC whole public warrant will entitle the registered holder to purchase one TMC Common Share at a price of $11.50 per share, subject to adjustment as discussed below, at any time commencing on the later of one year from the closing of SOAC's initial public offering and 30 days after the completion of the

Business Combination, provided in each case that TMC has an effective registration statement under the Securities Act covering the TMC Common Shares issuable upon exercise of the warrants and a current prospectus relating to them is available (or we permit holders to exercise their warrants on a cashless basis under the circumstances specified in the warrant agreement) and such shares are registered, qualified or exempt from registration under the securities, or blue sky, laws of the state of residence of the holder. Pursuant to the warrant agreement, a warrant holder may exercise its warrants only for a whole number of TMC Common Shares. This means only a whole warrant may be exercised at a given time by a warrant holder. No fractional warrants will be issued upon separation of the units, and only whole warrants will trade. Accordingly, unless you hold at least three units, you will not be able to receive or trade a whole warrant. The warrants will expire five years after the completion of our initial business combination, at 5:00 p.m., New York City time, or earlier upon redemption or liquidation.

We will not be obligated to deliver any TMC Common Shares pursuant to the exercise of a warrant and will have no obligation to settle such warrant exercise unless a registration statement under the Securities Act with respect to the TMC Common Shares underlying the warrants is then effective and a prospectus relating thereto is current, subject to our satisfying our obligations described below with respect to registration, or a valid exemption from registration is available. No warrant will be exercisable and we will not be obligated to issue a share of TMC Common Shares upon exercise of a warrant unless the share of TMC Common Shares issuable upon such warrant exercise has been registered, qualified or deemed to be exempt under the securities laws of the state of residence of the registered holder of the warrants. In the event that the conditions in the two immediately preceding sentences are not satisfied with respect to a warrant, the holder of such warrant will not be entitled to exercise such warrant and such warrant may have no value and expire worthless. In no event will we be required to net cash settle any warrant. In the event that a registration statement is not effective for the exercised warrants, the purchaser of a unit containing such warrant will have paid the full purchase price for the unit solely for the share of TMC Common Shares underlying such unit.

We have agreed that as soon as practicable, but in no event later than 20 business days after the closing of the Business Combination, we will use our commercially reasonable efforts to file with the SEC a registration statement covering the TMC Common Shares issuable upon exercise of the warrants, and we will use our commercially reasonable efforts to cause the same to become effective within 60 business days after the closing of the Business Combination, and to maintain the effectiveness of such registration statement and a current prospectus relating to those TMC Common Shares until the warrants expire or are redeemed, as specified in the warrant agreement; provided that if our TMC Common Shares are at the time of any exercise of a warrant not listed on a national securities exchange such that they satisfy the definition of a “covered security” under Section 18(b)(1) of the Securities Act, we may, at our option, require holders of public warrants who exercise their warrants to do so on a “cashless basis” in accordance with Section 3(a)(9) of the Securities Act and, in the event we so elect, we will not be required to file or maintain in effect a registration statement. If a registration statement covering the TMC Common Shares issuable upon exercise of the warrants is not effective by the 60th day after the closing of the Business Combination, warrant holders may, until such time as there is an effective registration statement and during any period when we will have failed to maintain an effective registration statement, exercise warrants on a “cashless basis” in accordance with Section 3(a)(9) of the Securities Act or another exemption, but we will use our best efforts to register or qualify the shares under applicable blue sky laws to the extent an exemption is not available.

Once the warrants become exercisable, we may call the warrants for redemption:

- in whole and not in part;
- at a price of $0.01 per warrant;
- upon not less than 30 days’ prior written notice of redemption to each warrant holder; and
- if, and only if, the closing price of the TMC Common Shares equals or exceeds $18.00 per share (as adjusted for share splits, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date on which notice of the redemption is given to the warrant holder.

If and when the warrants become redeemable by us, we may exercise our redemption right even if we are unable to register or qualify the underlying securities for sale under all applicable state securities laws.

We have established the last of the redemption criterion discussed above to prevent a redemption call unless there is at the time of the call a significant premium to the warrant exercise price. If the foregoing conditions are satisfied and we issue a notice of redemption of the warrants, each warrant holder will be entitled to exercise his, her or its warrant prior to the scheduled redemption date. However, the price of the TMC Common Shares may fall below the $18.00 redemption trigger price (as adjusted for share splits, share capitalizations, reorganizations, recapitalizations and the like) as well as the $11.50 (for whole shares) warrant exercise price after the redemption notice is issued.

If we call the warrants for redemption when the price per share of TMC Common Shares equals or exceeds $18.00, our management will have the option to require any holder that wishes to exercise his, her or its warrant to do so on a "cashless basis" beginning on the third trading day prior to the date on which notice of the redemption is given to the holders of warrants. In determining whether to require all holders to exercise their warrants on a "cashless basis," our management will consider, among other factors, our cash position, the number of warrants that are outstanding and the dilutive effect on our shareholders of issuing the maximum number of TMC Common Shares issuable upon the exercise of our warrants. If our management takes advantage of this option, all holders of warrants would pay the exercise price by surrendering their warrants for that number of shares equal to the lesser of (A) the quotient obtained by dividing (x) the product of the number of TMC Common Shares underlying the warrants, multiplied by the excess of the "fair market value" (defined below) over the exercise price of the warrants by (y) the fair market value and (B) 0.365. The "fair market value" will mean the average closing price of the TMC Common Shares for the ten (10) trading days ending on the third trading day prior to the date on which the notice of redemption is sent to the holders of warrants. If our management takes advantage of this option, the notice of redemption will contain the information necessary to calculate the number of TMC Common Shares to be received upon exercise of the warrants, including the "fair market value" in such case. Requiring a cashless exercise in this manner will reduce the number of shares to be issued and thereby lessen the dilutive effect of a warrant redemption. We believe this feature is an attractive option to us if we do not need the cash from the exercise of the warrants after our initial business combination. If we call our warrants for redemption and our management team does not take advantage of this option, our Sponsor and its permitted transferees would still be entitled to exercise their private placement warrants for cash or on a cashless basis using the same formula described above that other warrant holders would have been required to use had all warrant holders been required to exercise their warrants on a cashless basis, as described in more detail below.

A holder of a warrant may notify us in writing in the event it elects to be subject to a requirement that such holder will not have the right to exercise such warrant, to the extent that after giving effect to such exercise, such person (together with such person's affiliates), to the warrant agent's actual knowledge, would beneficially own in excess of 4.9% or 9.8% (as specified by the holder) of the TMC Common Shares issued and outstanding immediately after giving effect to such exercise.

Anti-dilution adjustments. If the number of outstanding TMC Common Shares is increased by a capitalization or share dividend payable in TMC Common Shares, or by a split-up of common shares or other similar event, then, on the effective date of such capitalization or share dividend, split-up or similar event, the number of TMC Common Shares issuable on exercise of each warrant will be increased in proportion to such increase in the outstanding common shares. A rights offering made to all or substantially all holders of common shares entitling holders to purchase TMC Common Shares at a price less than the "historical fair market value" (as defined below) will be deemed a share dividend of a number of TMC Common Shares equal to the product of (i) the number of TMC Common Shares actually sold in such rights offering (or issuable under any other equity securities sold in such rights offering that are convertible into or exercisable for TMC Common Shares) and (ii) one minus the quotient of (x) the price per TMC Common Shares paid in such rights offering and (y) the historical fair market value. For these purposes, (i) if the rights offering is for securities convertible into or exercisable for Class A ordinary shares, in determining the price payable for TMC Common Shares, there will be taken into account any consideration received for such rights, as well as any additional amount payable upon exercise or conversion and (ii) "historical fair market value" means the volume weighted average price of TMC Common Shares as reported during the 10 trading day period ending on the trading day prior to the first date on which the TMC Common Shares trade on the applicable exchange or in the applicable market, regular way, without the right to receive such rights.

In addition, if we, at any time while the warrants are outstanding and unexpired, pay a dividend or make a distribution in cash, securities or other assets to all or substantially all the holders of TMC Common Shares on account of such shares (or other securities into which the warrants are convertible), other than (a) as described above,

(b) any cash dividends or cash distributions which, when combined on a per share basis with all other cash dividends and cash distributions paid on the TMC Common Shares during the 365-day period ending on the date of declaration of such dividend or distribution does not exceed $0.50 (as adjusted to appropriately reflect any other adjustments and excluding cash dividends or cash distributions that resulted in an adjustment to the exercise price or to the number of TMC Common Shares issuable on exercise of each warrant) but only with respect to the amount of the aggregate cash dividends or cash distributions equal to or less than $0.50 per share, or (c) to satisfy the redemption rights of the holders of TMC Common Shares in connection with the Business Combination, then the warrant exercise price will be decreased, effective immediately after the effective date of such event, by the amount of cash and/or the fair market value of any securities or other assets paid on each share of TMC Common Shares in respect of such event.

If the number of outstanding TMC Common Shares is decreased by a consolidation, combination, reverse share split or reclassification of share of TMC Common Shares or other similar event, then, on the effective date of such consolidation, combination, reverse share split, reclassification or similar event, the number of TMC Common Shares issuable on exercise of each warrant will be decreased in proportion to such decrease in outstanding TMC Common Shares.

Whenever the number of TMC Common Shares purchasable upon the exercise of the warrants is adjusted, as described above, the warrant exercise price will be adjusted by multiplying the warrant exercise price immediately prior to such adjustment by a fraction (x) the numerator of which will be the number of TMC Common Shares purchasable upon the exercise of the warrants immediately prior to such adjustment and (y) the denominator of which will be the number of TMC Common Shares so purchasable immediately thereafter.

In case of any reclassification or reorganization of the outstanding TMC Common Shares (other than those described above or that solely affects the par value of such TMC Common Shares), or in the case of any merger or consolidation of TMC with or into another company (other than a consolidation or merger in which we are the continuing company and that does not result in any reclassification or reorganization of our outstanding TMC Common Shares), or in the case of any sale or conveyance to another company or entity of the assets or other property of us as an entirety or substantially as an entirety in connection with which we are dissolved, the holders of the warrants will thereafter have the right to purchase and receive, upon the basis and upon the terms and conditions specified in the warrants and in lieu of the TMC Common Shares immediately theretofore purchasable and receivable upon the exercise of the rights represented thereby, the kind and amount of TMC Common Shares or other securities or property (including cash) receivable upon such reclassification, reorganization, merger or consolidation, or upon a dissolution following any such sale or transfer, that the holder of the warrants would have received if such holder had exercised their warrants immediately prior to such event. If less than 70% of the consideration receivable by the holders of TMC Common Shares in such a transaction is payable in the form of TMC Common Shares in the successor entity that is listed for trading on a national securities exchange or is quoted in an established over-the-counter market, or is to be so listed for trading or quoted immediately following such event, and if the registered holder of the warrant properly exercises the warrant within thirty (30) days following public disclosure of such transaction, the warrant exercise price will be reduced as specified in the warrant agreement based on the Black-Scholes value (as defined in the warrant agreement) of the warrant. The purpose of such exercise price reduction is to provide additional value to holders of the warrants when an extraordinary transaction occurs during the exercise period of the warrants pursuant to which the holders of the warrants otherwise do not receive the full potential value of the warrants.

The warrants are issued in registered form under a warrant agreement between Continental Stock Transfer & Trust Company, as warrant agent, and us. The warrant agreement provides that the terms of the warrants may be amended without the consent of any holder to cure any ambiguity or correct any defective provision or correct any mistake, including to conform the provisions of the warrant agreement to the description of the terms of the warrants and the warrant agreement set forth in SOAC’s prospectus for its initial public offering, but requires the approval by the holders of at least 50% of the then outstanding public warrants to make any change that adversely affects the interests of the registered holders. You should review a copy of the warrant agreement, which is filed as an exhibit to the registration statement of which this prospectus is a part, for a complete description of the terms and conditions applicable to the warrants.

The warrant holders do not have the rights or privileges of holders of TMC Common Shares and any voting rights until they exercise their warrants and receive TMC Common Shares.

No fractional warrants will be issued upon separation of the units and only whole warrants will trade. If, upon exercise of the warrants, a holder would be entitled to receive a fractional interest in a share, we will, upon exercise, round down to the nearest whole number the number of TMC Common Shares to be issued to the warrant holder.

Private Placement Warrants

The private placement warrants (including the TMC Common Shares issuable upon exercise of the private placement warrants) will not be transferable, assignable or salable until 30 days after the completion of the Business Combination, except pursuant to limited exceptions to our officers and directors and other persons or entities affiliates with the initial purchasers of the private placement warrants, and they will not be redeemable by us, except as described above when the prices per share of TMC Common Shares equals or exceeds $10.00, so long as they are held by Sponsor or its permitted transferees. Sponsor, or its permitted transferees, has the option to exercise the private placement warrants on a cashless basis. Except as described below, the private placement warrants have terms and provisions that are identical to those of the public warrants. If the private placement warrants are held by holders other than Sponsor or its permitted transferees, the private placement warrants will be redeemable by us and exercisable by the holders on the same basis as the public warrants.

Except as described above regarding redemption procedures and cashless exercise in respect of the public warrants, if holders of the private placement warrants elect to exercise them on a cashless basis, they would pay the exercise price by surrendering his, her or its warrants for that number of TMC Common Shares equal to the quotient obtained by dividing (x) the product of the number of TMC Common Shares underlying the warrants, multiplied by the excess of the "fair market value" (defined below) over the exercise price of the warrants by (y) the fair market value. The "fair market value" shall mean the average reported closing price of the TMC Common Shares for the ten (10) trading days ending on the third trading day prior to the date on which the notice of warrant exercise is sent to the warrant agent.

Allseas Warrant

Also on March 4, 2021, DeepGreen issued the Allseas Warrant to Allseas, which shall vest upon successful completion of the PMTS and become exercisable for a maximum of 10,000,000 DeepGreen Common Shares (as it may be adjusted based on the formula described therein) at a purchase price of $0.01 per share, and which will be assumed by TMC and become a warrant to purchase TMC Common Shares upon the consummation of the Business Combination, in accordance with the terms of the Allseas Warrant. The Allseas Warrant was issued to Allseas in lieu of any future obligation to issue the Success Fee Shares. The Allseas Warrant shall vest only upon (and not before) the successful completion of the PMTS. The Warrant Credit Value shall be determined as of June 1, 2022 based on the closing trading price of the TMC Common Shares. In the event that the Warrant Credit Value is greater than $150,000,000, then on the vesting date of the Allseas Warrant, TMC shall receive a "credit" for the amount by which such Warrant Credit Value exceeds $150,000,000. TMC will be able to exchange such credit value for future goods and services from Allseas. No amount will be due or receivable under the Allseas Warrant if the Warrant Credit Value is under $150,000,000 on June 1, 2022. The Allseas Warrant shall expire on September 30, 2026.

Certain Important Provisions of the TMC Notice and Articles and the BCBCA

The following is a summary of certain important provisions of our articles and certain related sections of the BCBCA. Please note that this is only a summary and is not intended to be exhaustive. This summary is subject to, and is qualified in its entirety by reference to, the provisions of our articles and the BCBCA.

Stated Objects or Purposes

The TMC Notice and Articles will not contain stated objects or purposes and will not place any limitations on the business that TMC may carry on following the Continuance.

Directors

Power to vote on matters in which a director is materially interested. Under the BCBCA, a director or senior officer of a company is liable to account to the company for any profit that accrues to the director or senior officer under or as a result of a contract or transaction in which the director or officer holds a disclosable interest if the contract or transaction is material to the company, the company has entered, or proposes to enter, into the contract or transaction, and either the director or senior officer has a material interest in the contract or transaction or is a director or senior officer of, or has a material interest in, a person who has a material interest in the contract or transaction,

unless otherwise provided for in the BCBCA. A director does not hold a disclosable interest in a contract or transaction if the contract or transaction: (i) is an arrangement by way of security granted by the company for money loaned to, or obligations undertaken by, the director, or a person in whom the director has a material interest, for the benefit the company or for one of our affiliates' benefit; (ii) relates to an indemnity or insurance permitted under the BCBCA; (iii) relates to the remuneration of the director in his or her capacity as director, officer, employee or agent of the company or of one of its affiliates; (iv) relates to a loan to the company and the director, or a person in whom the director has a material interest, is the guarantor of some or all of the loan; or (v) is with a company that is affiliated to the company and the director is also a director or senior officer of that company or an affiliate of that company.

A director who holds a disclosable interest may also be liable to account to the company for any profit that accrues to the director under or as a result of a contract or transaction in which the director holds a disclosable interest, if the contract or transaction is: (i) approved by the other non-interested directors (unless all directors have a disclosable interest) or by a special resolution of the shareholders, after the nature and extent of the disclosable interest has been disclosed to the directors or shareholders, as applicable, or (ii) the contract or transaction was entered into before the individual became a director, the disclosable interest was disclosed to the other directors or shareholders and the director who holds the disclosable interest does not vote on any decision or resolution touching on the contract or transaction. Directors will also be required to comply with certain other relevant provisions of the BCBCA regarding conflicts of interest. A director who holds such disclosable interest in respect of any material contract or transaction into which the company has entered or propose to enter may be required to absent himself or herself from the meeting while discussions and voting with respect to the matter are taking place.

Directors' power to determine the remuneration of directors. The remuneration of TMC's directors, if any, may be determined by TMC's directors subject to TMC's articles. The remuneration may be in addition to any salary or other remuneration paid to any of TMC's employees (including executive officers) who are also directors.

Number of shares required to be owned by a director. TMC's articles will not and the BCBCA does not provide that a director is required to hold any of TMC's shares as a qualification for holding his or her office. The TMC Board has discretion to prescribe minimum share ownership requirements for directors.

Shareholder Meetings

Subject to applicable exchange requirements, and the BCBCA, TMC, upon the Continuance, will have to hold a general meeting of its shareholders at least once every year at a time and place determined by its board of directors, provided that the meeting must not be held later than 15 months after the preceding annual general meeting, unless an extension is obtained. A meeting of TMC's shareholders may be held anywhere in or outside British Columbia. The board may also determine that shareholders may attend a meeting of shareholders by means of telephone, electronic or other communications facilities that permit all participants to communicate with each other during the meeting.

A notice to convene a meeting, specifying the date, time and location of the meeting, and, where a meeting is to consider special business, the general nature of the special business, among other things, must be sent to each shareholder entitled to attend the meeting and to each director, so long that the company is a public company, not less than 21 days and no more than two months prior to the meeting, although, as a result of applicable securities laws, the minimum time for notice is effectively longer in most circumstances. Under the BCBCA, shareholders entitled to notice of a meeting may waive or reduce the period of notice for that meeting, provided applicable securities laws are met. The accidental omission to send notice of any meeting of shareholders to, or the non-receipt of any notice by, any person entitled to notice does not invalidate any proceedings at that meeting.

A quorum for meetings of shareholders is present if at least two shareholders who, in the aggregate, hold at least one-third ($33^{1}/_{3}\%$) of the issued shares entitled to vote at the meeting, are present in person or represented by proxy at the meeting. If a quorum is not present within one half hour from the time set for the opening of any meeting of shareholders, the meeting stands adjourned to the same day in the next week at the same time and place, unless the meeting was requisitioned by shareholders, in which case the meeting is dissolved.

Holders of TMC Common Shares are entitled to attend and vote at meetings of TMC's shareholders except meetings at which only holders another class of shares are entitled to vote. Except as otherwise provided with respect to any particular series of preferred shares or TMC Special Shares, and except as otherwise required by law, the holders of TMC's preferred shares and/or TMC Special Shares are not entitled to receive notice of, or to attend or vote at any meetings of TMC's shareholders. TMC's directors and officers, TMC's auditor and any other persons

invited by TMC's directors or the chair of the meeting are entitled to attend any meeting of TMC's shareholders but will not be counted in the quorum or be entitled to vote at the meeting unless he or she is a shareholder or proxyholder entitled to vote at the meeting.

Shareholder Proposals and Advance Notice Procedures

Under the BCBCA, qualified shareholders holding at least (i) 1% of the TMC Common Shares or (ii) TMC Common Shares with a fair market value in excess of CAD$2,000 may make proposals for matters to be considered at the annual general meeting of shareholders. Such proposals must be sent to TMC in advance of any proposed meeting by delivering a timely written notice in proper form to TMC's registered office in accordance with the requirements of the BCBCA. The notice must include information on the business the shareholder intends to bring before the meeting. To be a qualified shareholder, a shareholder must currently be and have been a registered or beneficial owner of at least one share of TMC for at least two years before the date of signing the proposal.

Certain advance notice provisions with respect to the election of TMC's directors will be included in TMC's Notice and Articles (the "Advance Notice Provisions"). The Advance Notice Provisions are intended to: (i) facilitate orderly and efficient annual general meetings or, where the need arises, special meetings; (ii) ensure that all shareholders receive adequate notice of board nominations and sufficient information with respect to all nominees; and (iii) allow shareholders to register an informed vote. Only persons who are nominated in accordance with the Advance Notice Provisions will be eligible for election as directors at any annual meeting of shareholders, or at any special meeting of shareholders if one of the purposes for which the special meeting was called was the election of directors.

Under the Advance Notice Provisions, a shareholder wishing to nominate a director would be required to provide TMC notice, in the prescribed form, within the prescribed time periods. These time periods include, (i) in the case of an annual meeting of shareholders (including annual and special meetings), not less than 30 days prior to the date of the annual meeting of shareholders; provided, that if the first public announcement of the date of the annual meeting of shareholders (the "Notice Date") is less than 50 days before the meeting date, not later than the close of business on the 10th day following the Notice Date; and (ii) in the case of a special meeting (which is not also an annual meeting) of shareholders called for any purpose which includes electing directors, not later than the close of business on the 15th day following the Notice Date.

These provisions could have the effect of delaying until the next shareholder meeting the nomination of certain persons for director that are favored by the holders of a majority of TMC's outstanding voting securities.

Forum Selection

TMC Notice and Articles will include a forum selection provision that provides that, unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of British Columbia, Canada and the appellate courts therefrom, will be the sole and exclusive forum for (i) any derivative action or proceeding brought on TMC's behalf; (ii) any action or proceeding asserting a claim of breach of a fiduciary duty owed by any of TMC's directors, officers, or other employees to TMC; (iii) any action or proceeding asserting a claim arising pursuant to any provision of the BCBCA or TMC Notice and Articles (as each may be amended from time to time); or (iv) any action or proceeding asserting a claim otherwise related to the relationships among TMC, its affiliates and their respective shareholders, directors and/or officers, but excluding claims related to TMC's business or of such affiliates. The forum selection provision also provides that TMC's securityholders are deemed to have consented to personal jurisdiction in the Province of British Columbia and to service of process on their counsel in any foreign action initiated in violation of the foregoing provisions. This provision will not apply to suits brought to enforce any duty or liability created by the Securities Act or the Exchange Act, or the rules and regulations thereunder.

For claims brought under the Securities Act, Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all claims brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder and TMC Notice and Articles will provide that the federal district courts of the United States of America will, to the fullest extent permitted by law, be the sole and exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act (the "Federal Forum Provision"). Application of the Federal Forum Provision means that suits brought by TMC's shareholders to enforce any duty or liability created by the Securities Act must be brought in federal court and cannot be brought in state court.

Section 27 of the Exchange Act creates exclusive federal jurisdiction over all claims brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder. Accordingly, actions by TMC's shareholders to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder must be brought in federal court. TMC's shareholders will not be deemed to have waived TMC's compliance with the federal securities laws and the regulations promulgated thereunder.

Any person or entity purchasing or otherwise acquiring or holding any interest in any of TMC Common Shares shall be deemed to have notice of and consented to the aforementioned forum selection provisions, including the Federal Forum Provision. Additionally, TMC's shareholders cannot waive compliance with the federal securities laws and the rules and regulations thereunder. These provisions may limit TMC's shareholders' ability to bring a claim in a judicial forum they find favorable for disputes with us or our directors, officers, or other employees, which may discourage lawsuits against TMC and its directors, officers, and other employees. Alternatively, if a court were to find the choice of forum provision contained in TMC Notice and Articles to be inapplicable or unenforceable in an action, TMC may incur additional costs associated with resolving such action in other jurisdictions, which could harm TMC's business, operating results and financial condition. See "*Risk Factors — The TMC Notice and Articles will provide that any derivative actions, actions relating to breach of fiduciary duties and other matters relating to TMC's internal affairs will be required to be litigated in the Province of British Columbia, Canada, and will contain exclusive federal forum provision for certain claims under the Securities Act, which could limit your ability to obtain a favorable judicial forum for disputes with TMC.*"

Limitation of Liability and Indemnification

Under the BCBCA, a company may indemnify: (i) a current or former director or officer of that company; (ii) a current or former director or officer of another company if, at the time such individual held such office, such company was an affiliate of the company, or if such individual held such office at the company's request; or (iii) an individual who, at the request of the company, held, or holds, an equivalent position in another entity (an "indemnifiable person") against all judgments, penalties or fines, or amounts paid to settle a proceeding or an action, in respect of any civil, criminal, administrative or other legal proceeding or investigative action (whether current, threatened, pending or completed) in which he or she is involved because of that person's position as an indemnifiable person (an "eligible proceeding"), unless: (i) the individual did not act honestly and in good faith with a view to the best interests of such company or the other entity, as the case may be; or (ii) in the case of a proceeding other than a civil proceeding, the individual did not have reasonable grounds for believing that the individual's conduct in respect of which proceeding was brought was lawful. A company cannot indemnify an indemnifiable person if it is prohibited from doing so under its articles or by applicable law. A company may pay, as they are incurred in advance of the final disposition of an eligible proceeding, the expenses actually and reasonably incurred.

Ownership and Exchange Controls

There is no limitation imposed by Canadian law or by the TMC Notice and Articles on the right of a non-resident to hold or vote TMC Common Shares, other than discussed below.

Competition Act

Limitations on the ability to acquire and hold TMC Common Shares may be imposed by the *Competition Act* (Canada). This legislation permits the Commissioner of Competition (the "Commissioner"), to review any acquisition or establishment, directly or indirectly, including through the acquisition of shares, of control over or of a significant interest in us. This legislation grants the Commissioner jurisdiction, for up to one year after the acquisition has been substantially completed, to challenge this type of acquisition by seeking a remedial order, including an order to prohibit the acquisition or require divestitures, from the Canadian Competition Tribunal, which may be granted where the Competition Tribunal finds that the acquisition substantially prevents or lessens, or is likely to substantially prevent or lessen, competition.

This legislation also requires any person or persons who intend to acquire more than 20% of our voting shares or, if such person or persons already own more than 20% of our voting shares prior to the acquisition, more than 50% of our voting shares, to file a notification with the Canadian Competition Bureau if certain financial thresholds are exceeded. Where a notification is required, unless an exemption is available, the legislation prohibits completion of the acquisition until the expiration of the applicable statutory waiting period, unless the Commissioner either waives or terminates such waiting period or issues an advance ruling certificate. The Commissioner's review of a notifiable transaction for substantive competition law considerations may take longer than the statutory waiting period.

Investment Canada Act

The *Investment Canada Act* requires each "non Canadian" (as defined in the *Investment Canada Act*) who acquires "control" of an existing "Canadian business," to file a notification in prescribed form with the responsible federal government department or departments not later than 30 days after closing, provided the acquisition of control is not a reviewable transaction under the *Investment Canada Act*. Subject to certain exemptions, a transaction that is reviewable under the *Investment Canada Act* may not be implemented until an application for review has been filed and the responsible Minister of the federal cabinet has determined that the investment is likely to be of "net benefit to Canada" taking into account certain factors set out in the *Investment Canada Act*. Under the *Investment Canada Act*, an investment in TMC Common Shares by a non-Canadian who is an investor originating from a country with which Canada has a free trade agreement, including a United States investor, would be reviewable only if it were an investment to acquire control of us pursuant to the *Investment Canada Act* and our enterprise value (as determined pursuant to the *Investment Canada Act* and its regulations) was equal to or greater than the amount specified, which is currently CAD$1.565 billion. For most other investors who are not state-owned enterprises the threshold is currently CAD$1.043 billion for 2021.

The *Investment Canada Act* contains various rules to determine if there has been an acquisition of control. Generally, for purposes of determining whether an investor has acquired control of a corporation by acquiring shares, the following general rules apply, subject to certain exceptions: the acquisition of a majority of the undivided ownership interests in the voting shares of the corporation is deemed to be acquisition of control of that corporation; the acquisition of less than a majority, but one-third or more, of the voting shares of a corporation or of an equivalent undivided ownership interest in the voting shares of the corporation is presumed to be acquisition of control of that corporation unless it can be established that, on the acquisition, the corporation is not controlled in fact by the acquirer through the ownership of voting shares; and the acquisition of less than one-third (1/3) of the voting shares of a corporation or of an equivalent undivided ownership interest in the voting shares of the corporation is deemed not to be acquisition of control of that corporation.

Under the national-security-review regime in the *Investment Canada Act*, review on a discretionary basis may also be undertaken by the federal government in respect to a much broader range of investments by a non-Canadian to "acquire, in whole or part, or to establish an entity carrying on all or any part of its operations in Canada." No financial threshold applies to a national-security review. The relevant test is whether such investment by a non-Canadian could be "injurious to national security." The responsible ministers have broad discretion to determine whether an investor is a non-Canadian and therefore subject to national-security review. Review on national-security grounds is at the discretion of the responsible ministers, and may occur on a pre- or post-closing basis.

Certain transactions relating to TMC Common Shares will generally be exempt from the *Investment Canada Act*, subject to the federal government's prerogative to conduct a national-security review, including:

- the acquisition of TMC Common Shares by a person in the ordinary course of that person's business as a trader or dealer in securities;
- the acquisition of control of us in connection with the realization of security granted for a loan or other financial assistance and not for any purpose related to the provisions of the Investment Canada Act; and
- the acquisition of control of us by reason of an amalgamation, merger, consolidation or corporate reorganization following which the ultimate direct or indirect control in fact of us, through ownership of TMC Common Shares, remains unchanged.

Other

There is no law, governmental decree or regulation in Canada that restricts the export or import of capital, or that would affect the remittance of dividends (if any) or other payments by TMC, following the Continuance, to non-resident holders of TMC Common Shares, other than withholding tax requirements.

Transfer Agent and Warrant Agent

The transfer agent for TMC Common Shares and warrant agent for the TMC public warrants and private placement warrants will be Continental Stock Transfer & Trust Company.

SECURITIES ACT RESTRICTIONS ON RESALE OF TMC COMMON SHARES

Pursuant to Rule 144 under the Securities Act ("Rule 144"), a person who has beneficially owned restricted TMC Common Shares for at least six months would be entitled to sell their securities provided that (i) such person is not deemed to have been an affiliate of TMC at the time of, or at any time during the three months preceding, a sale and (ii) TMC is subject to the Exchange Act periodic reporting requirements for at least three months before the sale and have filed all required reports under Section 13 or 15(d) of the Exchange Act during the twelve months (or such shorter period as TMC was required to file reports) preceding the sale.

Persons who have beneficially owned restricted TMC Common Shares for at least six months but who are affiliates of TMC at the time of, or at any time during the three months preceding, a sale, would be subject to additional restrictions, by which such person would be entitled to sell within any three-month period only a number of securities that does not exceed the greater of:

- 1% of the total number of TMC Common Shares then outstanding; or
- the average weekly reported trading volume of the TMC Common Shares during the four calendar weeks preceding the filing of a notice on Form 144 with respect to the sale.

Sales by affiliates of TMC under Rule 144 are also limited by manner of sale provisions and notice requirements and to the availability of current public information about TMC.

Restrictions on the Use of Rule 144 by Shell Companies or Former Shell Companies

Rule 144 is not available for the resale of securities initially issued by shell companies (other than business combination related shell companies) or issuers that have been at any time previously a shell company. However, Rule 144 also includes an important exception to this prohibition if the following conditions are met:

- the issuer of the securities that was formerly a shell company has ceased to be a shell company;
- the issuer of the securities is subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act;
- the issuer of the securities has filed all Exchange Act reports and material required to be filed, as applicable, during the preceding twelve months (or such shorter period that the issuer was required to file such reports and materials), other than Form 8-K reports; and
- at least one year has elapsed from the time that the issuer filed current Form 10 type information with the SEC reflecting its status as an entity that is not a shell company.

As a result, our initial shareholders will be able to sell their Class B ordinary shares and private placement warrants, as applicable, pursuant to Rule 144 without registration one year after we have completed our initial business combination.

We anticipate that following the consummation of the Business Combination, TMC will no longer be a shell company, and so, once the conditions set forth in the exceptions listed above are satisfied, Rule 144 will become available for the resale of the above noted restricted securities.

SHAREHOLDER COMMUNICATIONS

Shareholders and interested parties may communicate with the SOAC Board, any committee chairperson or the non-management directors as a group by writing to the board or committee chairperson in care of Sustainable Opportunities Acquisition Corp., 1601 Bryan Street, Suite 4141, Dallas, Texas 75201. Following the Business Combination, such communications should be sent in care of TMC, 595 Howe Street, 10th Floor, Vancouver, British Columbia, Canada V6C 2T5. Each communication will be forwarded, depending on the subject matter, to the board of directors, the appropriate committee chairperson or all non-management directors.

LEGAL MATTERS

Kirkland & Ellis LLP, Houston, TX, has passed upon the validity of the warrants of TMC offered by this proxy statement/prospectus and certain other legal matters related to this proxy statement/prospectus. Stikeman Elliott LLP has passed upon the validity of the common shares offered by this proxy statement/prospectus and matters of Canadian law.

EXPERTS

The financial statements of Sustainable Opportunities Acquisition Corp. as of December 31, 2020 and 2019 and for the year ended December 31, 2020 and the period from December 18, 2019 (inception) through December 31, 2019 appearing in this proxy statement/prospectus have been audited by Marcum LLP, independent registered public accounting firm, as set forth in their report thereon which includes an explanatory paragraph as to the Company's ability to continue as a going concern, appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

The consolidated financial statements of DeepGreen Metals Inc. as of December 31, 2020 and 2019, and for the years ended December 31, 2020 and 2019, included in this proxy statement/prospectus have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

DELIVERY OF DOCUMENTS TO SHAREHOLDERS

Pursuant to the rules of the SEC, SOAC and services that it employs to deliver communications to its shareholders are permitted to deliver to two or more shareholders sharing the same address a single copy of each of SOAC's annual report to shareholders and SOAC's proxy statement. Upon written or oral request, SOAC will deliver a separate copy of the annual report to shareholders and/or proxy statement to any shareholder at a shared address to which a single copy of each document was delivered and who wishes to receive separate copies of such documents. Shareholders receiving multiple copies of such documents may likewise request that SOAC delivers single copies of such documents in the future. Shareholders receiving multiple copies of such documents may request that SOAC delivers single copies of such documents in the future. Shareholders may notify SOAC of their requests by calling or writing SOAC at its registered offices at 1601 Bryan Street, Suite 4141, Dallas, Texas 75201 or (952) 456-5304.

ENFORCEABILITY OF CIVIL LIABILITY

Upon the Continuance, TMC will be incorporated under the laws of British Columbia with its principal executive offices being located at 595 Howe Street, 10th Floor, Vancouver, British Columbia, Canada V6C 2T5. Most of TMC's directors and officers reside outside of the United States and all or a substantial portion of our assets and those of such persons are located outside the United States. Consequently, it may be difficult for U.S. investors to effect service of process within the United States upon TMC or its directors or officers who are not residents of the United States, or to realize in the United States upon judgments of courts of the United States predicated upon civil liabilities under the Securities Act. Investors should not assume that Canadian courts: (i) would enforce judgments of U.S. courts obtained in actions against TMC or such persons predicated upon the civil liability provisions of the U.S. federal securities laws or the securities or blue sky laws of any state within the United States or (ii) would enforce, in original actions, liabilities against TMC or such persons predicated upon the U.S. federal securities laws or any such state securities or blue sky laws.

TRANSFER AGENT AND REGISTRAR

The transfer agent for SOAC's securities is Continental Stock Transfer & Trust Company.

WHERE YOU CAN FIND MORE INFORMATION

SOAC has filed a registration statement on Form S-4 to register the issuance of securities described elsewhere in this proxy statement/prospectus. This proxy statement/prospectus is a part of that registration statement.

SOAC files reports, proxy statements and other information with the SEC as required by the Exchange Act. You may access information on SOAC at the SEC website containing reports, proxy statements and other information at: *http://www.sec.gov*. Those filings are also available free of charge to the public on, or accessible through, SOAC's corporate website at *https://www.greenspac.com/*. SOAC's website and the information contained on, or that can be accessed through, the website is not deemed to be incorporated by reference in, and is not considered part of, this proxy statement/prospectus.

Information and statements contained in this proxy statement/prospectus or any Annex to this proxy statement/prospectus are qualified in all respects by reference to the copy of the relevant contract or other Annex filed as an exhibit to the registration statement of which this proxy statement/prospectus forms a part, which includes exhibits incorporated by reference from other filings made with the SEC.

All information contained in this proxy statement/prospectus relating to SOAC has been supplied by SOAC, and all such information relating to DeepGreen has been supplied by DeepGreen. Information provided by one another does not constitute any representation, estimate or projection of the other.

If you would like additional copies of this proxy statement/prospectus or if you have questions about the Business Combination, you should contact via phone or in writing:

Morrow Sodali LLC
Phone: (203) 658-9400
Email: SOAC.info@investor.morrowsodali.com

To obtain timely delivery of the documents, you must request them no later than five business days before the date of the meeting, or no later than , 2021.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors of
Sustainable Opportunities Acquisition Corp.

Opinion on the Financial Statements

We have audited the accompanying balance sheets of Sustainable Opportunities Acquisition Corp. (the "Company") as of December 31, 2020 and 2019, the related statements of operations, changes in shareholders' equity and cash flows for the year ended December 31, 2020 and for the period from December 18, 2019, (inception) through December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for the year ended December 31, 2020 and for the period from December 18, 2019 (inception) through December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

Restatement of the 2020 Financial Statements

As discussed in Note 2 to the financial statements the accompanying financial statements as of December 31, 2020 and for the year then ended have been restated.

Explanatory Paragraph - Going Concern

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the financial statements, the Company's business plan is dependent on the completion of a business combination by November 8, 2021, and the Company's cash and working capital as of December 31, 2020 are not sufficient to complete its planned activities which raise substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audit**s**. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit**s** to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit**s**, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit**s** included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audit**s** provide a reasonable basis for our opinion.

/s/ Marcum LLP

Marcum LLP

We have served as the Company's auditor since 2019.

Philadelphia, PA
March 30, 2021, except for the effects of the restatement discussed in Note 2 as to which the date is May 26, 2021

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
BALANCE SHEETS

	December 31, 2020	December 31, 2019
	(As Restated)	
Assets:		
Current assets:		
Cash	$ 1,299,301	$ —
Prepaid expenses	209,784	15,961
Total current assets	1,509,085	15,961
Investments held in Trust Account	300,069,135	—
Deferred offering costs associated with initial public offering	—	103,660
Total Assets	**$ 301,578,220**	**$ 119,621**
Liabilities and Shareholders' Equity:		
Current liabilities:		
Accounts payable	$ 34,298	$ 23,060
Accrued expenses	1,846,704	80,600
Total current liabilities	1,881,002	103,660
Long term liabilities:		
Warrant Liability	56,930,000	—
Deferred underwriting commissions	10,500,000	—
Total liabilities	69,311,002	103,660
Commitments and Contingencies (Note 6)		
Class A ordinary shares, $0.0001 par value; 22,726,721 and -0- shares subject to possible redemption at $10.00 per share at December 31, 2020 and December 31, 2019, respectively	227,267,210	—
Shareholders' Equity:		
Preference shares, $0.0001 par value; 1,000,000 shares authorized; none issued and outstanding	—	—
Class A ordinary shares, $0.0001 par value; 300,000,000 shares authorized; 7,273,279 and -0- shares issued and outstanding (excluding 22,726,721 and -0- shares subject to possible redemption) at December 31, 2020 and December 31, 2019, respectively	727	—
Class B ordinary shares, $0.0001 par value; 30,000,000 shares authorized; 7,500,000 shares issued and outstanding at December 31, 2020 and 8,625,000 shares issued and outstanding at December 31, 2019, respectively	750	863
Additional paid-in capital	41,549,625	24,137
Accumulated deficit	(36,551,094)	(9,039)
Total shareholders' equity	5,000,008	15,961
Total Liabilities and Shareholders' Equity	**$ 301,578,220**	**$ 119,621**

The accompanying notes are an integral part of these financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
STATEMENTS OF OPERATIONS

	For the Year ended December 31, 2020	For the Period from December 18, 2019 (inception) to December 31, 2019
	(As Restated)	
General and administrative expenses	$ 2,923,654	$ 9,039
General and administrative expenses – related party	80,000	—
Loss from operations	(3,003,654)	(9,039)
Change in fair value of the warrant liability	(32,730,000)	—
Offering costs allocated to derivative warrant liabilities	(877,647)	—
Net gain on investments held in Trust Account	69,135	—
Interest earned	111	—
Net loss	$ (36,542,055)	$ (9,039)
Weighted average shares outstanding subject to possible redemption, basic and diluted	25,440,915	—
Basic and diluted net income per share, shares subject to possible redemption	$ 0.00	$ —
Weighted average ordinary shares outstanding, basic and diluted	10,464,651	8,625,000
Basic and diluted net loss per share, Non-redeemable shares	$ (3.50)	$ (0.00)

The accompanying notes are an integral part of these financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY (As Restated)

For the Year Ended December 31, 2020

	Ordinary Shares						
	Class A		Class B		Additional Paid-in Capital	Accumulated Deficit	Total Shareholders' Equity
	Shares	Amount	Shares	Amount			
Balance – December 31, 2019	**—**	**$ —**	**8,625,000**	**$ 863**	**$ 24,137**	**$ (9,039)**	**15,961**
Sale of units in initial public offering, less fair value of Public Warrant	30,000,000	3,000	—	—	285,297,000	—	285,300,000
Forfeiture of Class B ordinary shares	—	—	(1,125,000)	(113)	113	—	—
Offering costs	—	—	—	—	(16,506,688)	—	(16,506,688)
Ordinary shares subject to possible redemption	(22,726,721)	(2,273)	—	—	(227,264,937)	—	(227,267,210)
Net loss	—	—	—	—		(36,542,055)	(36,542,055)
Balance – December 31, 2020	**7,273,279**	**$ 727**	**7,500,000**	**$ 750**	**$ 41,549,624**	**$ (36,551,094)**	**$ 5,000,008**

For the Period from December 18, 2019 (inception) to December 31, 2019

	Ordinary Shares						
	Class A		Class B		Additional Paid-in Capital	Accumulated Deficit	Total Shareholders' Equity
	Shares	Amount	Shares	Amount			
Balance – December 18, 2019 (Inception)	**—**	**$ —**	**—**	**$ —**	**$ —**	**$ —**	**$ —**
Issuance of Class B ordinary shares to Sponsor	—	—	8,625,000	863	24,137	—	25,000
Net loss	—	—	—	—	—	(9,039)	(9,039)
Balance – December 31, 2019	**—**	**$ —**	**8,625,000**	**$ 863**	**$ 24,137**	**$ (9,039)**	**$ 15,961**

The accompanying notes are an integral part of these financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
STATEMENTS OF CASH FLOWS

	For the Year ended December 31, 2020	For the Period from December 18, 2019 (inception) to December 31, 2019
	(As Restated)	
Cash Flows from Operating Activities:		
Net loss	$ (36,542,055)	$ (9,039)
Adjustments to reconcile net loss to net cash used in operating activities:		
Change in fair value of derivative warrant liability	32,730,000	—
Offering costs allocated to derivative warrant liabilities	877,647	
General and administrative expenses paid by related party under note agreement	70,123	9,039
Net gain on investments held in Trust Account	(69,135)	—
Changes in operating assets and liabilities:		
Prepaid expenses	(197,094)	—
Accounts payable	(51,821)	—
Accrued expenses	1,846,704	—
Net cash used in operating activities	(1,335,631)	—
Cash Flows from Investing Activities		
Cash deposited in Trust Account	(300,000,000)	—
Net cash used in investing activities	(300,000,000)	—
Cash Flows from Financing Activities:		
Proceeds received from initial public offering, gross	300,000,000	—
Proceeds from private placement	9,500,000	—
Offering costs paid	(6,702,089)	—
Repayment of note payable from related party	(162,979)	—
Net cash provided by financing activities	302,634,932	—
Net change in cash	1,299,301	—
Cash – beginning of the period	—	—
Cash – end of the period	**$ 1,299,301**	**$ —**
Supplemental disclosure of noncash investing and financing activities:		
Offering costs included in accounts payable	$ 85,000	$ 23,060
Offering costs included in accrued expenses	$ —	$ 80,600
Offering costs funded with note payable to Sponsor	$ 92,856	$ —
Offering costs paid by Sponsor in exchange for issuance of Class B ordinary shares to Sponsor	$ —	$ 15,961
Use of retainer for offering costs	$ 3,271	$ —
Deferred underwriting commissions in connection with the initial public offering	$ 10,500,000	$ —
Initial value of Class A ordinary shares subject to possible redemption	$ 262,826,540	$ —
Change in value of Class A ordinary shares subject to possible redemption	$ (35,559,330)	$ —

The accompanying notes are an integral part of these financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations

Sustainable Opportunities Acquisition Corp. (the "Company") is a newly organized blank check company incorporated as a Cayman Islands exempted company on December 18, 2019. The Company was incorporated for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses or entities (the "Business Combination"). The Company is an emerging growth company and, as such, the Company is subject to all of the risks associated with emerging growth companies.

As of December 31, 2020, the Company had not commenced any operations. All activity for the period from December 18, 2019 (inception) through December 31, 2020 relates to the Company's formation and the initial public offering (the "Initial Public Offering") described below, and, since the closing of the Initial Public Offering, a search for a business combination candidate. The Company will not generate any operating revenues until after the completion of its initial Business Combination, at the earliest. The Company generates non-operating income in the form of interest income on cash from the proceeds derived from the Initial Public Offering and interest income earned on investments held in Trust Account.

Sponsor, Initial Public Offering and Private Placement

The Company's sponsor is Sustainable Opportunities Holdings LLC, a Delaware limited liability company (the "Sponsor"). The registration statement for the Company's Initial Public Offering was declared effective on May 5, 2020. On May 8, 2020, the Company consummated its Initial Public Offering of 30,000,000 units (the "Units" and, with respect to the Class A ordinary shares included in the Units being offered, the "Public Shares") at $10.00 per Unit, generating gross proceeds of $300.0 million, and incurring offering costs of approximately $17.4 million, inclusive of $10.5 million in deferred underwriting commissions (Note 6).

Simultaneously with the closing of the Initial Public Offering, the Company consummated the private placement ("Private Placement") of 9,500,000 warrants (each, a "Private Placement Warrant" and collectively, the "Private Placement Warrants") at a price of $1.00 per Private Placement Warrant in a private placement to the Sponsor, generating gross proceeds of $9.5 million (Note 5).

Trust Account

Upon the closing of the Initial Public Offering and the Private Placement, $300.0 million ($10.00 per Unit) of the net proceeds of the sale of the Units in the Initial Public Offering and the Private Placement were placed in a trust account (the "Trust Account"), located in the United States at JP Morgan Chase Bank, N.A., with Continental Stock Transfer & Trust Company acting as trustee, and invested only in U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by the Company meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of the Investment Company Act, as determined by the Company, until the earlier of: (i) the completion of a Business Combination and (ii) the distribution of the Trust Account as described below.

Initial Business Combination

The Company's management has broad discretion with respect to the specific application of the net proceeds of the Initial Public Offering and the sale of Private Placement Warrants, although substantially all of the net proceeds are intended to be applied generally toward consummating a Business Combination. There is no assurance that the Company will be able to complete a Business Combination successfully. The Company must complete one or more initial Business Combinations having an aggregate fair market value of at least 80% of the assets held in the Trust Account (as defined below) (excluding the deferred underwriting commissions and taxes payable on income earned on the Trust Account) at the time of the signing of the agreement to enter into the initial Business Combination. However, the Company will only complete a Business Combination if the post-transaction company owns or acquires 50% or more of the outstanding voting securities of the target or otherwise acquires a controlling interest in the target sufficient for it not to be required to register as an investment company under the Investment Company Act 1940, as amended (the "Investment Company Act").

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations (cont.)

The Company will provide the holders (the "Public Shareholders") of its Class A ordinary shares, par value $0.0001 per share sold in the Initial Public Offering (the "Public Shares") with the opportunity to redeem all or a portion of their Public Shares upon the completion of a Business Combination either (i) in connection with a shareholder meeting called to approve the Business Combination or (ii) by means of a tender offer. The decision as to whether the Company will seek shareholder approval of a Business Combination or conduct a tender offer will be made by the Company, solely in its discretion. The Public Shareholders will be entitled to redeem their Public Shares for a pro rata portion of the amount then in the Trust Account (initially anticipated to be $10.00 per Public Share). The per-share amount to be distributed to Public Shareholders who redeem their Public Shares will not be reduced by the deferred underwriting commissions the Company will pay to the underwriter (as discussed in Note 6). These Public Shares will be recorded at a redemption value and classified as temporary equity upon the completion of the Initial Public Offering in accordance with the Financial Accounting Standards Board's ("FASB") Accounting Standards Codification ("ASC") Topic 480 "Distinguishing Liabilities from Equity." In such case, the Company will proceed with a Business Combination if the Company has net tangible assets of at least $5,000,001 upon such consummation of a Business Combination and a majority of the shares voted are voted in favor of the Business Combination. If a shareholder vote is not required by law and the Company does not decide to hold a shareholder vote for business or other legal reasons, the Company will, pursuant to the amended and restated memorandum and articles of association, which the Company adopted upon the consummation of the Initial Public Offering (the "Amended and Restated Memorandum and Articles of Association") conduct the redemptions pursuant to the tender offer rules of the U.S. Securities and Exchange Commission ("SEC") and file tender offer documents with the SEC prior to completing a Business Combination. If, however, shareholder approval of the transactions is required by law, or the Company decides to obtain shareholder approval for business or legal reasons, the Company will offer to redeem shares in conjunction with a proxy solicitation pursuant to the proxy rules and not pursuant to the tender offer rules. Additionally, each Public Shareholder may elect to redeem their Public Shares irrespective of whether they vote for or against the proposed transaction. If the Company seeks shareholder approval in connection with a Business Combination, the Initial Shareholders (as defined below) have agreed to vote their Founder Shares (as defined below in Note 5) and any Public Shares purchased during or after the Initial Public Offering in favor of a Business Combination. In addition, the Initial Shareholders have agreed to waive their redemption rights with respect to their Founder Shares and Public Shares in connection with the completion of a Business Combination.

Notwithstanding the foregoing, the Amended and Restated Memorandum and Articles of Association will provide that a Public Shareholder, together with any affiliate of such shareholder or any other person with whom such shareholder is acting in concert or as a "group" (as defined under Section 13 of the Securities Exchange Act of 1934, as amended (the "Exchange Act")), will be restricted from redeeming its shares with respect to more than an aggregate of 15% or more of the Class A ordinary shares sold in the Initial Public Offering, without the prior consent of the Company.

The Company's Sponsor, officers and directors (the "Initial Shareholders") have agreed not to propose an amendment to the Amended and Restated Memorandum and Articles of Association that would affect the substance or timing of the Company's obligation to provide holders of its Public Shares the right to have their shares redeemed in connection with its initial business combination or to redeem 100% of its Public Shares if the Company does not complete a Business Combination within 18 months from the closing of the Initial Public Offering, or November 8, 2021 (the "Combination Period") unless the Company provides the Public Shareholders with the opportunity to redeem their Class A ordinary shares in conjunction with any such amendment.

If the Company is unable to complete a Business Combination within the Combination Period, the Company will: (i) cease all operations except for the purpose of winding up; (ii) as promptly as reasonably possible but not more than ten business days thereafter, redeem the Public Shares, at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the Trust Account, including interest earned on the funds held in the Trust Account and not previously released to the Company to pay for its tax obligations, if any (less up to $100,000 of interest to pay dissolution expenses) divided by the number of the then-outstanding Public Shares, which redemption will completely extinguish Public Shareholders' rights as shareholders (including the right to receive further liquidation distributions, if any); and (iii) as promptly as reasonably possible following such redemption, subject to

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations (cont.)

the approval of the remaining shareholders and the Company's board of directors, liquidate and dissolve, subject in the case of clauses (ii) and (iii), to the Company's obligations under Cayman Islands law to provide for claims of creditors and the requirements of other applicable law.

The Initial Shareholders have agreed to waive their liquidation rights with respect to the Founder Shares if the Company fails to complete a Business Combination within the Combination Period. However, if the Initial Shareholders acquire Public Shares in or after the Initial Public Offering, they will be entitled to liquidating distributions from the Trust Account with respect to such Public Shares if the Company fails to complete a Business Combination within the Combination Period. The underwriter has agreed to waive its rights to its deferred underwriting commission (see Note 6) held in the Trust Account in the event the Company does not complete a Business Combination within the Combination Period and, in such event, such amounts will be included with the other funds held in the Trust Account that will be available to fund the redemption of the Public Shares. In the event of such distribution, it is possible that the per share value of the residual assets remaining available for distribution (including Trust Account assets) will be only $10.00 per share initially held in the Trust Account. In order to protect the amounts held in the Trust Account, the Sponsor has agreed to be liable to the Company if and to the extent any claims by a third party for services rendered or products sold to the Company, or a prospective target business with which the Company has discussed entering into a transaction agreement, reduce the amount of funds in the Trust Account. This liability will not apply with respect to any claims by a third party who executed a waiver of any right, title, interest or claim of any kind in or to any monies held in the Trust Account or to any claims under the Company's indemnity of the underwriter of the Initial Public Offering against certain liabilities, including liabilities under the Securities Act of 1933, as amended (the "Securities Act"). Moreover, in the event that an executed waiver is deemed to be unenforceable against a third party, the Sponsor will not be responsible to the extent of any liability for such third party claims. The Company will seek to reduce the possibility that the Sponsor will have to indemnify the Trust Account due to claims of creditors by endeavoring to have all vendors, service providers, prospective target businesses or other entities with which the Company does business, execute agreements with the Company waiving any right, title, interest or claim of any kind in or to monies held in the Trust Account.

Proposed Business Combination

On March 4, 2021, the Company entered into a Business Combination Agreement (the "*Business Combination Agreement*"), by and among the Company, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("*NewCo Sub*"), and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada (the "*Company*" or "*DeepGreen*").

Pursuant to the Business Combination Agreement, the Company will migrate to and be continued as a company in British Columbia, Canada (the "*SOAC Continuance*"). Following the SOAC Continuance, pursuant to a plan of arrangement (the "*Plan of Arrangement*") under the *Business Corporations Act* (British Columbia), (i) the Company will acquire all of the issued and outstanding shares in the capital of DeepGreen (the "*DeepGreen Shares*") from DeepGreen shareholders in exchange for the Company's common shares (as defined below) and Company Earnout Shares (as defined in Note 9) (the "*Share Exchange*"), (ii) DeepGreen will become a wholly-owned subsidiary of the Company, and (iii) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement and the Plan of Arrangement and in accordance with the provisions of applicable law.

Concurrently with the execution of the Business Combination Agreement, the Company entered into subscription agreements (the "Subscription Agreements") with certain institutional and accredited investors, pursuant to which such investors agreed to subscribe for and purchase, and the Company agreed to issue and sell to such investors, substantially concurrently with the Closing (as defined in the Business Combination Agreement), an aggregate of 33,030,000 shares of SOAC Ordinary shares for $10.00 per share, for aggregate gross proceeds of $330,300,000 (the "PIPE Financing"). The closing of the PIPE Financing is contingent upon, among other things, the substantially concurrent consummation of the Business Combination. The Subscription Agreements provide that the Company will grant the investors in the PIPE Financing certain customary registration rights. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination. See Note 9.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations (cont.)

Going Concern Consideration

As of December 31, 2020, the Company had approximately $1.3 million in cash and a working capital deficit of approximately $372,000.

Until the consummation of a Business Combination, the Company will be using the funds not held in the Trust Account for identifying and evaluating prospective acquisition candidates, performing due diligence on prospective target businesses, paying for travel expenditures, selecting the target business to acquire, and structuring, negotiating and consummating the Business Combination. The Company will need to raise additional capital through loans or additional investments from its Sponsor, stockholders, officers, directors, or third parties. The Company's officers, directors and Sponsor may, but are not obligated to, loan the Company funds, from time to time or at any time, in whatever amount they deem reasonable in their sole discretion, to meet the Company's working capital needs. Accordingly, the Company may not be able to obtain additional financing. If the Company is unable to raise additional capital, it may be required to take additional measures to conserve liquidity, which could include, but not necessarily be limited to, curtailing operations, suspending the pursuit of a potential transaction, and reducing overhead expenses.

The Company cannot provide any assurance that new financing will be available to it on commercially acceptable terms, if at all. These conditions raise substantial doubt about the Company's ability to continue as a going concern through November 8, 2021. These financial statements do not include any adjustments relating to the recovery of the recorded assets or the classification of the liabilities that might be necessary should the Company be unable to continue as a going concern.

Basis of Presentation

The accompanying financial statements are presented in U.S. dollars in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP") for financial information and pursuant to the rules and regulations of the SEC.

Emerging Growth Company

The Company is an "emerging growth company," as defined in Section 2(a) of the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"), and it may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, reduced disclosure obligations regarding executive compensation in its periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

Further, Section 102(b)(1) of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies (that is, those that have not had a Securities Act registration statement declared effective or do not have a class of securities registered under the Exchange Act) are required to comply with the new or revised financial accounting standards. The JOBS Act provides that an emerging growth company can elect to opt out of the extended transition period and comply with the requirements that apply to non-emerging growth companies but any such election to opt out is irrevocable. The Company has elected not to opt out of such extended transition period which means that when a standard is issued or revised, and it has different application dates for public or private companies, the Company, as an emerging growth company, can adopt the new or revised standard at the time private companies adopt the new or revised standard. This may make comparison of the Company's financial statements with other public companies difficult or impossible because of the potential differences in accounting standards used.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 2 — Restatement of Previously Issued Financial Statements

On April 12, 2021, the Staff of the SEC issued a statement entitled "Staff Statement on Accounting and Reporting Considerations for Warrants Issued by Special Purpose Acquisition Companies." In the statement, the SEC Staff, among other things, highlighted potential accounting implications of certain terms that are ordinary in warrants issued in connection with the initial public offerings of special purpose acquisition companies such as the Company. As a result of the Staff statement and in light of evolving views as to certain provisions ordinarily included in warrants issued by special purpose acquisition companies, the Company's management re-evaluated the accounting for our Warrants under ASC 815-40, *Derivatives and Hedging—Contracts in Entity's Own Equity*, and concluded that they do not meet the criteria to be classified in shareholders' equity. Since the Warrants meet the definition of a derivative under ASC 815-40, the Company has restated the financial statements to classify the Warrants as liabilities on the balance sheet at fair value, with subsequent changes in their respective fair values recognized in the statement of operations at each reporting date.

The Company's prior accounting treatment for the Warrants was equity classification rather than as derivative liabilities. Accounting for the Warrants as liabilities pursuant to ASC 815-40 requires that the Company re-measure the Warrants to their fair value each reporting period and record the changes in such value in the statement of operations. Accordingly, the Company has restated the value and classification of the Warrants in our financial statements included herein ("Restatement").

In April 2021, the Company concluded that, because of a misapplication of the accounting guidance related to its warrants issued in connection with its initial public offering ("Public Warrants"), as well as warrants issued in a private sale simultaneous to the initial public offering ("Private Placement Warrants") that the Company issued in May 2020, the Company's previously issued financial statements as of May 8, 2020, as of and for the year ended December 31, 2020 as well as the interim periods ended June 30, 2020 and September 30, 2020 (the "Affected Periods") should no longer be relied upon. As such, the Company is restating its financial statements for the Affected Periods in this Annual Report. The following summarizes the effect of the Restatement on each financial statement line item for each period presented herein.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 2 — Restatement of Previously Issued Financial Statements (cont.)

BALANCE SHEETS

		May 8, 2020	June 30, 2020	September 30, 2020	December 31, 2020
Warrant liability	As Previously Reported	—	—	—	—
	Adjustments	24,200,000	23,030,000	45,050,000	56,930,000
	As Restated	24,200,000	23,030,000	45,050,000	56,930,000
Total Liabilities	As Previously Reported	11,299,788	10,753,271	11,443,090	12,381,002
	Adjustments	24,200,000	23,030,000	45,050,000	56,930,000
	As Restated	35,499,788	33,783,271	56,493,090	69,311,002
Class A ordinary shares subject to possible redemption	As Previously Reported	287,041,190	286,786,990	285,557,170	284,197,210
	Adjustments	(24,214,650)	(23,030,000)	(45,050,000)	(56,930,000)
	As Restated	262,826,540	263,756,990	240,507,170	227,267,210
Class A ordinary shares subject to possible redemption, shares outstanding	As Previously Reported	28,704,119	28,678,699	28,555,717	28,419,721
	Adjustments	(2,421,465)	(2,303,000)	(4,505,000)	(5,693,000)
	As Restated	26,282,654	26,375,699	24,050,717	22,726,721
Class A ordinary shares	As Previously Reported	130	132	144	158
	Adjustments	242	230	451	569
	As Restated	372	362	595	727
Class A ordinary shares, shares outstanding	As Previously Reported	1,295,881	1,321,301	1,444,283	1,580,279
	Adjustments	2,421,465	2,303,000	4,505,000	5,693,000
	As Restated	3,717,346	3,624,301	5,949,283	7,273,279
Additional paid-in capital	As Previously Reported	5,113,134	5,352,792	6,582,601	7,942,547
	Adjustments	877,413	(292,578)	21,727,203	33,607,078
	As Restated	5,990,547	5,060,214	28,309,804	41,549,625
Accumulated deficit	As Previously Reported	(114,123)	(353,668)	(1,583,490)	(2,943,447)
	Adjustments	(877,647)	292,353	(21,727,647)	(33,607,647)
	As Restated	(991,770)	(61,315)	(23,311,137)	(36,551,094)
Total Shareholders' equity	As Previously Reported	5,000,004	5,000,006	5,000,005	5,000,008
	Adjustments	(2)	1	—	—
	As Restated	5,000,002	5,000,007	5,000,005	5,000,008

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 2 — Restatement of Previously Issued Financial Statements (cont.)

STATEMENTS OF OPERATIONS - YTD

		Six Months Ended June 30, 2020	Nine Months Ended September 30, 2020	Year Ended December 31, 2020
Change in fair value of the warrant liability	As Previously Reported	—	—	—
	Adjustments	1,170,000	(20,850,000)	(32,730,000)
	As Restated	1,170,000	(20,850,000)	(32,730,000)
Offering costs allocated to derivative warrant liabilities	As Previously Reported	—	—	—
	Adjustments	(877,647)	(877,647)	(877,647)
	As Restated	(877,647)	(877,647)	(877,647)
Net loss	As Previously Reported	(344,629)	(1,574,451)	(2,934,408)
	Adjustments	292,353	(21,727,647)	(33,607,647)
	As Restated	(52,276)	(23,302,098)	(36,542,055)
Weighted average shares outstanding subject to possible redemption, basic and diluted	As Previously Reported	N/A	N/A	28,635,732
	Adjustments	26,284,377	26,325,998	(3,194,817)
	As Restated	26,284,377	26,325,998	25,440,915
Basic and diluted net income per share, shares subject to redemption	As Previously Reported	N/A	N/A	$ 0.00
	Adjustments	$ 0.00	$ 0.00	$ 0.00
	As Restated	$ 0.00	$ 0.00	$ 0.00
Weighted average ordinary shares outstanding, basic and diluted	As Previously Reported	8,675,841	8,724,681	8,387,147
	Adjustments	(73,403)	732,999	2,077,504
	As Restated	8,602,438	9,457,680	10,464,651
Basic and diluted net loss per share, Non-redeemable shares	As Previously Reported	$ (0.04)	$ (0.19)	$ (0.36)
	Adjustments	$ 0.03	$ (2.28)	$ (3.14)
	As Restated	$ (0.01)	$ (2.47)	$ (3.50)

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 2 — Restatement of Previously Issued Financial Statements (cont.)

STATEMENTS OF OPERATIONS - THREE MONTHS ENDED

		Three Months Ended June 30, 2020	Three Months Ended September 30, 2020
Change in fair value of the warrant liability	As Previously Reported	—	—
	Adjustments	1,170,000	(22,020,000)
	As Restated	1,170,000	(22,020,000)
Offering costs allocated to derivative warrant liabilities	As Previously Reported	—	—
	Adjustments	(877,647)	—
	As Restated	(877,647)	—
Net income (loss)	As Previously Reported	(285,630)	(1,229,822)
	Adjustments	292,353	(22,020,000)
	As Restated	6,723	(23,249,822)
Weighted average shares outstanding subject to possible redemption, basic and diluted	As Previously Reported	N/A	N/A
	Adjustments	26,284,377	26,325,998
	As Restated	26,284,377	26,325,998
Basic and diluted net income per share, shares subject to redemption	As Previously Reported	N/A	N/A
	Adjustments	$ 0.00	$ 0.00
	As Restated	$ 0.00	$ 0.00
Weighted average ordinary shares outstanding, basic and diluted	As Previously Reported	8,726,681	8,821,301
	Adjustments	978,194	2,344,174
	As Restated	9,704,875	11,165,475
Basic and diluted net loss per share, Non-redeemable shares	As Previously Reported	$ (0.04)	$ (0.14)
	Adjustments	$ 0.04	$ (1.94)
	As Restated	$ (0.00)	$ (2.08)

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 2 — Restatement of Previously Issued Financial Statements (cont.)

STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

		June 30, 2020	September 30, 2020	December 31, 2020
Class A ordinary shares	As Previously Reported	132	144	158
	Adjustments	230	451	569
	As Restated	362	595	727
Additional Paid in Capital	As Previously Reported	5,352,793	6,582,601	7,942,547
	Adjustments	(292,579)	21,727,203	33,607,078
	As Restated	5,060,214	28,309,804	41,549,625
Accumulated Deficit	As Previously Reported	(353,668)	(1,583,490)	(2,943,447)
	Adjustments	292,353	(21,727,647)	(33,607,647)
	As Restated	(61,315)	(23,311,137)	(36,551,094)
Total Shareholders' Equity	As Previously Reported	5,000,006	5,000,005	5,000,008
	Adjustments	1	—	—
	As Restated	5,000,007	5,000,005	5,000,008

STATEMENTS OF CASH FLOWS

		Six Months Ended June 30, 2020	Nine Months Ended September 30, 2020	Year Ended December 31, 2020
Net loss	As Previously Reported	(344,629)	(1,574,451)	(2,934,408)
	Adjustments	292,353	(21,727,647)	(33,607,647)
	As Restated	(52,276)	(23,302,098)	(36,542,055)
Change in fair value of warrant liability	As Previously Reported	—	—	—
	Adjustments	(1,170,000)	20,850,000	32,730,000
	As Restated	(1,170,000)	20,850,000	32,730,000
Offering costs allocated to derivative warrant liabilities	As Previously Reported	—	—	—
	Adjustments	877,647	877,647	877,647
	As Restated	877,647	877,647	877,647
Initial value of Class A ordinary shares subject to possible redemption	As Previously Reported	287,041,190	287,041,190	287,041,190
	Adjustments	(24,214,650)	(24,214,650)	(24,214,650)
	As Restated	262,826,540	262,826,540	262,826,540
Change in value of Class A ordinary shares subject to possible redemption	As Previously Reported	(254,200)	(1,229,820)	(2,843,980)
	Adjustments	1,184,650	(22,020,000)	(32,715,350)
	As Restated	930,450	(23,249,820)	(35,559,330)

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 3 — Summary of Significant Accounting Policies

Use of Estimates

The preparation of the financial statements in conformity with U.S. GAAP requires the Company's management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date the financial statements and the reported amounts of expenses during the reporting periods. Actual results could differ from those estimates.

Making estimates requires management to exercise significant judgment. It is at least reasonably possible that the estimate of the effect of a condition, situation or set of circumstances that existed at the date of the financial statements, which management considered in formulating its estimate, could change in the near term due to one or more future confirming events. Accordingly, the actual results could differ significantly from those estimates.

Financial instruments that potentially subject the Company to concentrations of credit risk consist of cash accounts in a financial institution, which, at times, may exceed the Federal Depository Insurance Coverage of $250,000 and investments held in Trust Account. The Company has not experienced losses on these accounts.

Cash and Cash Equivalents

The Company considers all short-term investments with an original maturity of three months or less when purchased to be cash equivalents. The Company had no cash equivalents as of December 31, 2020 and 2019, respectively.

Investments Held in Trust Account

The Company's portfolio of marketable securities is comprised solely of U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by the Company meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of the Investment Company Act. Upon the closing of the Initial Public Offering and the Private Placement, $300 million was placed in the Trust Account and invested in money market funds that invest in U.S. government securities. All of the Company's investments held in the Trust Account are classified as trading securities. Trading securities are presented on the balance sheet at fair value at the end of each reporting period. Gains and losses resulting from the change in fair value of investments held in Trust Account are included in net gain on investments held in Trust Account in the accompanying statement of operations. The estimated fair values of investments held in Trust Account are determined using available market information.

Fair Value Measurement

Fair value is defined as the price that would be received for sale of an asset or paid for transfer of a liability, in an orderly transaction between market participants at the measurement date. U.S. GAAP establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value.

The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). These tiers include:

- Level 1, defined as observable inputs such as quoted prices for identical instruments in active markets;
- Level 2, defined as inputs other than quoted prices in active markets that are either directly or indirectly observable such as quoted prices for similar instruments in active markets or quoted prices for identical or similar instruments in markets that are not active; and
- Level 3, defined as unobservable inputs in which little or no market data exists, therefore requiring an entity to develop its own assumptions, such as valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 3 — Summary of Significant Accounting Policies (cont.)

In some circumstances, the inputs used to measure fair value might be categorized within different levels of the fair value hierarchy. In those instances, the fair value measurement is categorized in its entirety in the fair value hierarchy based on the lowest level input that is significant to the fair value measurement.

Offering Costs Associated with the Initial Public Offering

The Company complies with the requirements of ASC 340-10-S99 and SEC Staff Accounting Bulletin ("SAB") Topic 5A — "Expenses of Offering". Offering costs consist of legal, accounting, underwriting fees and other costs that were directly related to the Initial Public Offering. Upon the completion of the Initial Public Offering on May 8, 2020, the offering costs were allocated to the separable financial instruments based on their relative fair value compared to the proceeds received, with $877,647 being expensed on fair value of warrant liabilities relative to Initial Public Offering proceeds.

Warrant Liabilities

The Company does not use derivative instruments to hedge exposures to cash flow, market, or foreign currency risks. The Company evaluates all of its financial instruments, including issued stock purchase warrants, to determine if such instruments are derivatives or contain features that qualify as embedded derivatives, pursuant to ASC 480 and ASC 815-15. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period.

The Company issued 15,000,000 warrants as part of the units offered in its Initial Public Offering and, simultaneously with the closing of Initial Public Offering, the Company issued in a private placement an aggregate of 9,500,000 private placement warrants. The Company accounts for the Warrants in accordance with the guidance contained in ASC 815-40-15-7D and 7F under which the Warrants do not meet the criteria for equity treatment and must be recorded as liabilities. Accordingly, the Company classifies the Warrants as liabilities at their fair value and adjusts the warrants to fair value at each reporting period. This liability is subject to re-measurement at each balance sheet date until exercised, and any change in fair value is recognized in the Company's statement of operations. The fair value of the Public Warrants was initially measured using a Modified Black Scholes Option Pricing Model and has subsequently been estimated using the Public Warrants' quoted market price. The Private Placement Warrants are valued using a Modified Black Scholes Option Pricing Model.

Class A Ordinary Shares subject to possible redemption

Class A ordinary shares subject to mandatory redemption (if any) are classified as liability instruments and are measured at fair value. Conditionally redeemable Class A ordinary shares (including Class A ordinary shares that feature redemption rights that are either within the control of the holder or subject to redemption upon the occurrence of uncertain events not solely within the Company's control) are classified as temporary equity. At all other times, Class A ordinary shares are classified as shareholders' equity. The Company's Class A ordinary shares feature certain redemption rights that are considered to be outside of the Company's control and subject to occurrence of uncertain future events. Accordingly, as of December 31, 2020, 22,726,721 Class A ordinary shares subject to possible redemption were presented at redemption value as temporary equity, outside of the shareholders' equity section of the Company's balance sheet.

Net Loss Per Ordinary Share

The Company applies the two-class method in calculating earnings per share. Net loss per share is computed by dividing net loss by the weighted-average number of ordinary shares outstanding during the periods. An aggregate of 22,726,721 and 0 Class A ordinary shares subject to possible redemption at December 31, 2020 and 2019, respectively has been excluded from the calculation of basic loss per ordinary share, since such shares, if redeemed, only participate in their pro rata share of the Trust earnings. The Company has not considered the effect of the warrants sold in the Initial Public Offering and Private Placement to purchase an aggregate of 24,500,000 Class A

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 3 — Summary of Significant Accounting Policies (cont.)

ordinary shares in the calculation of diluted loss per ordinary share, since the exercise of the warrants are contingent upon the occurrence of future events. As a result, diluted net loss per ordinary share is the same as basic net loss per ordinary share for the periods presented.

Reconciliation of Net Loss per Ordinary Share

The Company's net loss is adjusted for the portion of income (loss) that is attributable to ordinary shares subject to redemption, as these shares only participate in the earnings of the Trust Account and not the income or losses of the Company. Accordingly, basic and diluted loss per ordinary share is calculated as follows:

	For the Year Ended December 31, 2020	For the Period from December 18, 2019 (inception) to December 31, 2019
Class A Ordinary Shares subject to possible redemption		
Numerator: Earnings allocable to Ordinary Shares subject to possible redemption		
Income from investments held in Trust Account	$ 65,492	$ —
Less: Company's portion available to be withdrawn to pay taxes	—	—
Net income attributable	**$ 65,492**	**$ —**
Denominator: Weighted average Class A ordinary shares subject to possible redemption		
Weighted average shares outstanding of shares subject to redemption, basic and diluted	**25,440,915**	**—**
Basic and diluted net income per share, shares subject to redemption	**$ —**	**$ —**
Non-Redeemable Ordinary Shares		
Numerator: Net Loss minus Net Earnings attributable to redeemable shares		
Net loss	$ (36,542,055)	$ (9,039)
Less: Income attributable to Class A ordinary shares subject to possible redemption	65,492	—
Non-redeemable net loss	$ (36,607,546)	$ (9,039)
Denominator: weighted average Non-redeemable ordinary shares		
Weighted average ordinary shares outstanding, basic and diluted	10,464,651	7,500,000
Basic and diluted net loss per share, Non-redeemable shares	**$ (3.50)**	**$ (0.00)**

Income Taxes

FASB ASC Topic 740, "Income Taxes," prescribes a recognition threshold and a measurement attribute for the financial statement recognition and measurement of tax positions taken or expected to be taken in a tax return. For those benefits to be recognized, a tax position must be more likely than not to be sustained upon examination by taxing authorities. There were no unrecognized tax benefits as of December 31, 2020 and December 31, 2019. The Company's management determined that the Cayman Islands is the Company's only major tax jurisdiction. The Company recognizes accrued interest and penalties related to unrecognized tax benefits as income tax expense. No amounts were accrued for the payment of interest and penalties as of December 31, 2020 and December 31, 2019. The Company is currently not aware of any issues under review that could result in significant payments, accruals or material deviation from its position. The Company is subject to income tax examinations by major taxing authorities since inception.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 3 — Summary of Significant Accounting Policies (cont.)

There is currently no taxation imposed on income by the Government of the Cayman Islands. In accordance with Cayman Islands income tax regulations, income taxes are not levied on the Company. Consequently, income taxes are not reflected in the Company's financial statements. The Company's management does not expect that the total amount of unrecognized tax benefits will materially change over the next twelve months.

Recent Accounting Standards

Management does not believe that any recently issued, but not yet effective, accounting pronouncements, if currently adopted, would have a material effect on the Company's financial statements.

Note 4 — Initial Public Offering

On May 8, 2020, the Company consummated its Initial Public Offering of 30,000,000 Units at $10.00 per Unit, generating gross proceeds of $300.0 million, and incurring offering costs of approximately $17.4 million, inclusive of $10.5 million in deferred underwriting commissions. Each Unit consists of one Class A ordinary share and one-half of one redeemable warrant (each, a "Public Warrant"). Each Public Warrant entitles the holder to purchase one Class A ordinary share at a price of $11.50 per share, subject to adjustment (see Note 8).

Note 5 — Related Party Transactions

Founder Shares

On December 31, 2019, the Sponsor purchased 8,625,000 shares (the "Founder Shares") of the Company's Class B ordinary shares, par value $0.0001 for an aggregate price of $25,000. In March 2020, the Sponsor transferred 30,000 Founder Shares to each of the Company's independent directors. The Founder Shares will automatically convert into Class A ordinary shares at the time of the Company's initial Business Combination and are subject to certain transfer restrictions, as described in Note 9. The Sponsor had agreed to forfeit up to 1,125,000 Founder Shares to the extent that the over-allotment option was not exercised in full by the underwriter so that the Founder Shares will represent 20.0% of the Company's issued and outstanding shares after the Initial Public Offering. The over-allotment option expired in June 2020; thus, these Founder Shares were forfeited accordingly.

The Initial Shareholders agreed, subject to limited exceptions, not to transfer, assign or sell any of their Founder Shares until the earlier to occur of: (A) one year after the completion of the initial Business Combination or (B) subsequent to the initial Business Combination, (x) if the last sale price of the Class A ordinary shares equals or exceeds $12.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after the initial Business Combination, or (y) the date on which the Company completes a liquidation, merger, share exchange or other similar transaction that results in all of the Company's shareholders having the right to exchange their Class A ordinary shares for cash, securities or other property.

Private Placement Warrants

Simultaneously with the closing of the Initial Public Offering, the Company consummated the Private Placement of 9,500,000 Private Placement Warrants at a price of $1.00 per Private Placement Warrant to the Sponsor, generating gross proceeds of $9.5 million. Each Private Placement Warrant is exercisable for one whole Class A ordinary share at a price of $11.50 per share.

A portion of the proceeds from the sale of the Private Placement Warrants was added to the proceeds from the Initial Public Offering held in the Trust Account. If the Company does not complete a Business Combination within the Combination Period, the Private Placement Warrants will expire worthless. The Private Placement Warrants will be non-redeemable and exercisable on a cashless basis so long as they are held by the Sponsor or its permitted transferees.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 5 — Related Party Transactions (cont.)

The Sponsor and the Company's officers and directors agreed, subject to limited exceptions, not to transfer, assign or sell any of their Private Placement Warrants until 30 days after the completion of the initial Business Combination.

Related Party Loans

On December 31, 2019, the Sponsor agreed to loan the Company an aggregate of up to $300,000 to cover expenses related to the Initial Public Offering pursuant to a promissory note (the "Note"). This loan was non-interest bearing and payable upon the completion of the Initial Public Offering. The Company borrowed approximately $163,000 under the Note and fully repaid this amount on May 8, 2020.

In addition, in order to finance transaction costs in connection with a Business Combination, the Sponsor or an affiliate of the Sponsor, or certain of the Company's officers and directors may, but are not obligated to, loan the Company funds as may be required ("Working Capital Loans"). If the Company completes a Business Combination, the Company would repay the Working Capital Loans out of the proceeds of the Trust Account released to the Company. Otherwise, the Working Capital Loans would be repaid only out of funds held outside the Trust Account. In the event that a Business Combination does not close, the Company may use a portion of the proceeds held outside the Trust Account to repay the Working Capital Loans but no proceeds held in the Trust Account would be used to repay the Working Capital Loans. Except for the foregoing, the terms of such Working Capital Loans, if any, have not been determined and no written agreements exist with respect to such loans. The Working Capital Loans would either be repaid upon consummation of a Business Combination, without interest, or, at the lender's discretion, up to $1.5 million of such Working Capital Loans may be convertible into warrants of the post Business Combination entity at a price of $1.00 per warrant. The warrants would be identical to the Private Placement Warrants. As of December 31, 2020, the Company had no borrowings under the Working Capital Loans.

Administrative Support Agreement

The Company entered into an agreement, commencing on May 8, 2020 through the earlier of the Company's consummation of a Business Combination and its liquidation, to reimburse the Sponsor a total of $10,000 per month for office space, secretarial and administrative services. The Company incurred and paid $80,000 and $0 in expenses in connection with such services and recorded in general and administrative expenses in the statements of operations for year ended December 31, 2020 and for the period December 18, 2019 (inception) to December 31, 2019, respectively.

Note 6 — Commitments and Contingencies

Registration and Shareholder Rights

The holders of Founder Shares, Private Placement Warrants and warrants that may be issued upon conversion of Working Capital Loans, if any, will be entitled to registration rights (in the case of the Founder Shares, only after conversion of such shares to Class A ordinary shares) pursuant to a registration and shareholder rights agreement. These holders will be entitled to certain demand and "piggyback" registration rights. However, the registration and shareholder rights agreement provides that the Company will not permit any registration statement filed under the Securities Act to become effective until the termination of the applicable lock-up period for the securities to be registered. The Company will bear the expenses incurred in connection with the filing of any such registration statements.

Underwriting Agreement

The Company granted the underwriter a 45-day option from the date of the final prospectus relating to the Initial Public Offering to purchase up to 4,500,000 additional Units to cover over-allotments, if any, at $10.00 per Unit, less the underwriting discounts and commissions. The over-allotment option expired in June 2020.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 6 — Commitments and Contingencies (cont.)

The underwriter was entitled to an underwriting discount of $0.20 per unit, or $6.0 million in the aggregate paid upon the closing of the Initial Public Offering. In addition, $0.35 per unit, or $10.5 million in the aggregate will be payable to the underwriter for deferred underwriting commissions. The deferred underwriting commissions will become payable to the underwriter from the amounts held in the Trust Account solely in the event that the Company completes a Business Combination, subject to the terms of the underwriting agreement.

Consulting Agreement

The Company is receiving consulting services in connection with identification of potential targets for a Business Combination and due diligence on such targets. As compensation for such services, the Company paid a nonrefundable fixed fee of $350,000 and agreed to pay the consulting firm $2,650,000 solely in the event that the Company completes a Business Combination. The consulting agreement may be terminated early by either party to the agreement provided that the Company pays a termination fee to the consulting firm determined based on a monthly increasing amount through November 2021. As of December 31, 2020, the termination fee is $1,115,800, which has been accrued and recognized in general and administrative expenses within the statements of operations.

Note 7 — Fair Value Measurements

The Company follows the guidance in ASC 820 for its financial assets and liabilities that are re-measured and reported at fair value at each reporting period, and non-financial assets and liabilities that are re-measured and reported at fair value at least annually.

As of December 31, 2020 and 2019, the carrying values of cash, prepaid expenses, and accounts payable approximate their fair values due to the short-term nature of the instruments. As of December 31, 2020, the Company's portfolio of investments held in Trust Account is comprised entirely of investments in money market funds that invest in U.S. government securities.

The Warrants are accounted for as liabilities pursuant to ASC 815-40 and are measured at fair value as of each reporting period. Changes in the fair value of the Warrants are recorded in the statement of operations each period.

The following table presents our fair value hierarchy for liabilities measured at fair value on a recurring basis for each reporting period:

December 31, 2020 (As Restated)	**Level 1**	**Level 2**	**Level 3**	**Total**
Warrant liabilities:				
Public Warrants	$ 33,750,000	$ —	$ —	$ 33,750,000
Private Placement Warrants	—	—	23,180,000	23,180,000
Total warrant liabilities	$ 33,750,000	$ —	$ 23,180,000	$ 56,930,000

September 30, 2020 (As Restated)	**Level 1**	**Level 2**	**Level 3**	**Total**
Warrant liabilities:				
Public Warrants[(1)]	$ 27,000,000	$ —	$ —	$ 27,000,000
Private Placement Warrants	—	—	18,050,000	18,050,000
Total warrant liabilities	$ 27,000,000	$ —	$ 18,050,000	$ 45,050,000

June 30, 2020 (As Restated)	**Level 1**	**Level 2**	**Level 3**	**Total**
Warrant liabilities:				
Public Warrants	$ 14,100,000	$ —	$ —	$ 14,100,000
Private Placement Warrants	—	—	8,930,000	8,930,000
Total warrant liabilities	$ 14,100,000	$ —	$ 8,930,000	$ 23,030,000

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 7 — Fair Value Measurements (cont.)

May 8, 2020 (As Restated)	Level 1	Level 2	Level 3	Total
Warrant liabilities:				
Public Warrants	$ —	$ —	$ 14,700,000	$ 14,700,000
Private Placement Warrants	—	—	9,500,000	9,500,000
Total warrant liabilities	$ —	$ —	$ 24,200,000	$ 24,200,000

(1) Due to the use of quoted prices in an active market (Level 1) to measure the fair value of the Public Warrants, subsequent to initial measurement, the Company had transfers out of Level 3 totaling $14,700,000 during the period May 8, 2020 through December 31, 2020.

The Private Placement Warrants were valued using a modified Black Scholes Model including inputs from a Monte Carlo simulation, which is considered to be a Level 3 fair value measurement. The Monte Carlo simulation's primary unobservable input utilized in determining the fair value of the Warrants is the probability of consummation of the Business Combination. The probability assigned to the consummation of the Business Combination was 88% which was estimated based on the observed success rates of business combinations for special purpose acquisition companies.

The following table provides quantitative information regarding Level 3 fair value measurements inputs at their measurement dates:

	As of May 8, 2020 (As Restated)	As of June 30, 2020 (As Restated)	As of September 30, 2020 (As Restated)	As of December 31, 2020 (As Restated)
Exercise price	$ 11.50	$ 11.50	$ 11.50	$ 11.50
IPO price	10.00	10.00	10.00	10.00
Implied stock price range (or underlying asset price at December 31, 2020)	9.51	9.70	10.20	10.76
Volatility	18.7%	17.45%	26.95%	30.5%
Term	5.91	5.75	5.50	5.25
Risk-free rate	0.44%	37.00%	33.00%	0.40%
Dividend yield	0.0%	0.0%	0.0%	0.0%

The following table presents the changes in the fair value of warrant liabilities:

	Private Placement	Public	Total Warrant Liabilities
Initial measurement on May 8, 2020 (As Restated)	$ 9,500,000	$ 14,700,000	$ 24,200,000
Change in fair value of warrant liability	(570,000)	(600,000)	(1,170,000)
Fair value, June 30, 2020 (As Restated)	$ 8,930,000	$ 14,100,000	$ 23,030,000
Change in fair value of warrant liability	9,120,000	12,900,000	22,020,000
Fair value, September 30, 2020 (As Restated)	$ 18,050,000	$ 27,000,000	$ 45,050,000
Change in fair value of warrant liability	5,130,000	6,750,000	11,880,000
Fair value, December 31, 2020 (As Restated)	$ 23,180,000	$ 33,750,000	$ 56,930,000

Note 8 — Shareholders' Equity

Preference Shares

The Company is authorized to issue 1,000,000 preference shares with such designations, voting and other rights and preferences as may be determined from time to time by the Company's board of directors. As of December 31, 2020 and December 31, 2019, there were no preference shares issued or outstanding.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 8 — Shareholders' Equity (cont.)

Ordinary Shares

Class A Ordinary Shares — The Company is authorized to issue 300,000,000 Class A ordinary shares with a par value of $0.0001 per share. As of December 31, 2020 and December 31, 2019, there were 30,000,000 and no Class A ordinary shares outstanding, including 28,419,721 and no Class A ordinary shares subject to possible redemption classified as temporary equity in the accompanying balance sheets, respectively.

Class B Ordinary Shares — The Company is authorized to issue 30,000,000 Class B ordinary shares with a par value of $0.0001 per share. Holders of Class B ordinary shares are entitled to one vote for each share. As of December 31, 2019, there were 8,625,000 Class B ordinary shares outstanding. Of these, an aggregate of up to 1,125,000 shares were subject to forfeiture to the Company by the Sponsor for no consideration to the extent that the underwriter's over-allotment option was not exercised in full or in part, so that the Initial Shareholders will collectively own 20% of the Company's issued and outstanding ordinary shares after the Initial Public Offering. The over-allotment option expired in June 2020; thus, an aggregate of 1,125,000 Class B ordinary shares was forfeited accordingly. As of December 31, 2020, there were 7,500,000 Class B ordinary shares outstanding.

Holders of the Class A ordinary shares and holders of the Class B ordinary shares will vote together as a single class on all matters submitted to a vote of the Company's shareholders except as required by law.

The Class B ordinary shares will automatically convert into Class A ordinary shares at the time of the initial Business Combination at a ratio such that the number of Class A ordinary shares issuable upon conversion of all Founder Shares will equal, in the aggregate, on an as-converted basis, 20% of the sum of (i) the total number of ordinary shares issued and outstanding upon completion of the Initial Public Offering, plus (ii) the total number of Class A ordinary shares issued or deemed issued or issuable upon conversion or exercise of any equity-linked securities or rights issued or deemed issued, by the Company in connection with or in relation to the consummation of the initial Business Combination, excluding any Class A ordinary shares or equity-linked securities exercisable for or convertible into Class A ordinary shares issued, or to be issued, to any seller in the initial Business Combination and any Private Placement Warrants issued to the Sponsor upon conversion of Working Capital Loans. Any conversion of Class B ordinary shares will take effect as a compulsory redemption of Class B ordinary shares and an issuance of Class A ordinary shares as a matter of Cayman Islands law. In no event will the Class B ordinary shares convert into Class A ordinary shares at a rate of less than one-to-one.

Warrants

Public Warrants may only be exercised for a whole number of shares. No fractional Public Warrants will be issued upon separation of the Units and only whole Public Warrants will trade. The Public Warrants will become exercisable on the later of (a) 30 days after the completion of a Business Combination or (b) 12 months from the closing of the Initial Public Offering; provided in each case that the Company has an effective registration statement under the Securities Act covering the issuance of the Class A ordinary shares issuable upon exercise of the warrants and a current prospectus relating to them is available and such shares are registered, qualified or exempt from registration under the securities, or blue sky, laws of the state of residence of the holder (or the Company permits holders to exercise their warrants on a cashless basis under certain circumstances). The Company has agreed that as soon as practicable, but in no event later than 20 business days, after the closing of a Business Combination, the Company will use its commercially reasonable efforts to file with the SEC a registration statement covering the Class A ordinary shares issuable upon exercise of the warrants and to maintain a current prospectus relating to those Class A ordinary shares until the warrants expire or are redeemed. If a registration statement covering the Class A ordinary shares issuable upon exercise of the warrants is not effective by the 60th day after the closing of the initial Business Combination, warrant holders may, until such time as there is an effective registration statement and during any period when the Company will have failed to maintain an effective registration statement, exercise warrants on a "cashless basis" in accordance with Section 3(a)(9) of the Securities Act or another exemption. The Public Warrants will expire five years after the completion of a Business Combination or earlier upon redemption or liquidation.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 8 — Shareholders' Equity (cont.)

Each whole Public Warrant entitles the holder to purchase one Class A ordinary share at a price of $11.50 per share. If (x) the Company issues additional Class A ordinary shares or equity-linked securities for capital raising purposes in connection with the closing of the initial Business Combination at an issue price or effective issue price of less than $9.20 per ordinary share (with such issue price or effective issue price to be determined in good faith by the Company and, (i) in the case of any such issuance to the Sponsor or its affiliates, without taking into account any Founder Shares held by the Sponsor or such affiliates, as applicable, prior to such issuance, and (ii) without taking into account the transfer of Founder Shares or Private Placement Warrants (including if such transfer is effectuated as a surrender to us and subsequent reissuance by the Company) by the Sponsor in connection with such issuance) (the "Newly Issued Price"), (y) the aggregate gross proceeds from such issuances represent more than 60% of the total equity proceeds, and interest thereon, available for the funding of the initial Business Combination on the date of the consummation of the initial Business Combination (net of redemptions), and (z) the volume weighted average trading price of the Company's Class A ordinary shares during the 20-trading day period starting on the trading day prior to the day on which the Company consummates its initial Business Combination (such price, the "Market Value") is below $9.20 per share, the exercise price of the warrants will be adjusted (to the nearest cent) to be equal to 115% of the higher of the Market Value and the Newly Issued Price, and the $18.00 per share redemption trigger price discussed below will be adjusted (to the nearest cent) to be equal to 180% of the higher of the Market Value and the Newly Issued Price.

The Company may call the Public Warrants for redemption (except with respect to the Private Placement Warrants):

- in whole and not in part;
- at a price of $0.01 per warrant;
- upon a minimum of 30 days' prior written notice of redemption, and
- if, and only if, the closing price of the Company's Class A ordinary shares equals or exceeds $18.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date on which the Company sends the notice of redemption to the warrant holders.

If the Company calls the Public Warrants for redemption, management will have the option to require all holders that wish to exercise the Public Warrants to do so on a "cashless basis," as described in the warrant agreement.

The Private Placement Warrants are identical to the Public Warrants underlying the Units sold in the Initial Public Offering, except that the Private Placement Warrants and the ordinary shares issuable upon exercise of the Private Placement Warrants will not be transferable, assignable or salable until 30 days after the completion of a Business Combination, subject to certain limited exceptions. Additionally, the Private Placement Warrants will be non-redeemable so long as they are held by the initial purchasers or such purchasers' permitted transferees. If the Private Placement Warrants are held by someone other than the Initial Shareholders or their permitted transferees, the Private Placement Warrants will be redeemable by the Company and exercisable by such holders on the same basis as the Public Warrants.

Additionally, in no event will the Company be required to net cash settle any Warrants. If the Company is unable to complete the initial Business Combination within the Combination Period and the Company liquidates the funds held in the Trust Account, holders of warrants will not receive any of such funds with respect to their warrants, nor will they receive any distribution from the Company's assets held outside of the Trust Account with the respect to such warrants. Accordingly, the warrants may expire worthless.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO FINANCIAL STATEMENTS

Note 9 — Subsequent Events

Proposed Business Combination and Related Transactions

On March 4, 2021, the Company entered into a Business Combination Agreement (the "*Business Combination Agreement*"), by and among the Company, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("*NewCo Sub*"), and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada (the "*Company*" or "*DeepGreen*").

Pursuant to the Business Combination Agreement, the Company will migrate to and be continued as a company in British Columbia, Canada (the "*SOAC Continuance*"). Following the SOAC Continuance, pursuant to a plan of arrangement (the "*Plan of Arrangement*") under the *Business Corporations Act* (British Columbia), (i) the Company will acquire all of the issued and outstanding shares in the capital of DeepGreen (the "*DeepGreen Shares*") from DeepGreen shareholders in exchange for the Company's common shares (as defined below) and Company Earnout Shares (as defined below) (the "*Share Exchange*"), (ii) DeepGreen will become a wholly-owned subsidiary of the Company, and (iii) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement and the Plan of Arrangement and in accordance with the provisions of applicable law.

Each option to purchase common shares in the capital of the Company (the "*DeepGreen Options*") will become an option to purchase SOAC Common Shares and Company Earnout Shares on the same terms and conditions (including applicable vesting, expiration and forfeiture provisions) that applied to the corresponding DeepGreen Options immediately prior to closing of the Business Combination.

The Proposed Business Combination is expected to close in the second quarter of 2021, following the receipt of the required approval by the Company's shareholders and the fulfillment of other conditions.

The shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Shares or DeepGreen Options, as applicable, an aggregate of (i) will receive shares in the capital of the Company or comparable equity awards that are settled or are exercisable for shares in the capital of the Company, as applicable, based on an implied DeepGreen equity value of $2.25 billion after giving effect to the SOAC Continuance (the "*SOAC Common Shares*"), (ii) 5,000,000 Class A Special Shares, (iii) 10,000,000 Class B Special Shares, (iv) 10,000,000 Class C Special Shares, (v) 20,000,000 Class D Special Shares, (vi) 20,000,000 Class E Special Shares, (vii) 20,000,000 Class F Special Shares, (viii) 25,000,000 Class G Special Shares and (ix) 25,000,000 Class H Special Shares, in each case, in the capital of SOAC (collectively, the "*Company Earnout Shares*"), or, as applicable, options to purchase such SOAC Common Shares and Company Earnout Shares.

Concurrently with the execution of the Business Combination Agreement, the Company entered into subscription agreements (the "*Subscription Agreements*") with certain institutional and accredited investors, pursuant to which such investors agreed to subscribe for and purchase, and the Company agreed to issue and sell to such investors, substantially concurrently with the Closing (as defined in the Business Combination Agreement), an aggregate of 33,030,000 shares of SOAC Common Shares for $10.00 per share, for aggregate gross proceeds of $330,300,000 (the "*PIPE Financing*"). The closing of the PIPE Financing is contingent upon, among other things, the substantially concurrent consummation of the Business Combination. The Subscription Agreements provide that the Company will grant the investors in the PIPE Financing certain customary registration rights. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination.

The Company evaluated subsequent events and transactions that occurred after the balance sheet date up to the date the financial statements were issued. Based upon this review, the Company did not identify any subsequent events that would have required adjustment or disclosure in the financial statements which have not previously been disclosed within the financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
CONDENSED BALANCE SHEETS

	March 31, 2021	December 31, 2020
	(unaudited)	
Assets:		
Current assets:		
Cash	$ 1,169,714	$ 1,299,301
Prepaid expenses	199,999	209,784
Total current assets	1,369,713	1,509,085
Investments held in Trust Account	300,073,644	300,069,135
Total Assets	**$ 301,443,357**	**$ 301,578,220**
Liabilities and Shareholders' Equity:		
Current liabilities:		
Accounts payable	$ 454,002	$ 34,298
Accrued expenses	4,302,517	1,846,704
Total current liabilities	4,756,519	1,881,002
Long term liabilities:		
Warrant liability	22,050,000	56,930,000
Deferred underwriting commissions	10,500,000	10,500,000
Total liabilities	37,306,519	69,311,002
Commitments and Contingencies (Note 5)		
Class A ordinary shares, $0.0001 par value; 25,913,683 and 22,726,721 shares subject to possible redemption at $10.00 per share at March 31, 2021 and December 31, 2020, respectively	259,136,830	227,267,210
Shareholders' Equity:		
Preference shares, $0.0001 par value; 1,000,000 shares authorized; none issued and outstanding	—	—
Class A ordinary shares, $0.0001 par value; 300,000,000 shares authorized; 4,086,317 and 7,273,279 shares issued and outstanding (excluding 25,913,683 and 22,726,721 shares subject to possible redemption) at March 31, 2021 and December 31, 2020, respectively	409	727
Class B ordinary shares, $0.0001 par value; 30,000,000 shares authorized; 7,500,000 shares issued and outstanding at March 31, 2021 and December 31, 2020, respectively	750	750
Additional paid-in capital	9,680,323	41,549,625
Accumulated deficit	(4,681,474)	(36,551,094)
Total shareholders' equity	5,000,008	5,000,008
Total Liabilities and Shareholders' Equity	**$ 301,443,357**	**$ 301,578,220**

The accompanying notes are an integral part of these condensed financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
CONDENSED STATEMENTS OF OPERATIONS (Unaudited)

	For the three months ended March 31, 2021	For the three months ended March 31, 2020
General and administrative expenses	$ 2,984,922	$ 58,999
General and administrative expenses – related party	30,000	—
Loss from operations	(3,014,922)	(58,999)
Other income:		
Change in fair value of warrant liability	34,880,000	—
Net gain on investments held in Trust Account	4,510	—
Interest earned	32	—
Total other income	34,884,542	—
Net income (loss)	$ 31,869,620	$ (58,999)
Weighted average shares outstanding of shares subject to redemption, basic and diluted	22,762,132	—
Basic and diluted net income per share, shares subject to redemption	$ 0.00	$ —
Weighted average ordinary shares outstanding, basic and diluted Basic and diluted net income (loss) per share	14,737,868	7,500,000
	$ 2.16	$ (0.01)

The accompanying notes are an integral part of these condensed financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
CONDENSED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY (Unaudited)

	For the three months ended March 31, 2021						
	Ordinary Shares						
	Class A		Class B		Additional Paid-in Capital	Accumulated Deficit	Total Shareholders' Equity
	Shares	Amount	Shares	Amount			
Balance – December 31, 2020	**7,273,279**	**$ 727**	**7,500,000**	**$ 750**	**$ 41,549,625**	**$ (36,551,094)**	**$ 5,000,008**
Ordinary shares subject to possible redemption	(3,186,962)	(318)	—	—	(31,869,302)	—	(31,869,620)
Net income	—	—	—	—	—	31,869,620	31,869,620
Balance – March 31, 2021	**4,086,317**	**$ 409**	**7,500,000**	**$ 750**	**$ 9,680,323**	**$ (4,681,474)**	**$ 5,000,008**

	For the three months ended March 31, 2020						
	Ordinary Shares						
	Class A		Class B		Additional Paid-in Capital	Accumulated Deficit	Total Shareholders' Equity
	Shares	Amount	Shares	Amount			
Balance – December 31, 2019	—	$ —	8,625,000	$ 863	$ 24,137	$ (9,039)	$ 15,961
Net loss	—	—	—	—	—	(58,999)	(58,999)
Balance – March 31, 2020	—	$ —	8,625,000	$ 863	$ 24,137	$ (68,038)	$ (43,038)

The accompanying notes are an integral part of these condensed financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
CONDENSED STATEMENT OF CASH FLOWS (Unaudited)

	For the three months ended March 31, 2021	For the three months ended March 31, 2020
Cash Flows from Operating Activities:		
Net income (loss)	$ 31,869,620	$ (58,999)
Adjustments to reconcile net income (loss) to net cash used in operating activities:		
Change in fair value of warrant liabilities	(34,880,000)	—
General and administrative expenses paid by related party under note agreement	—	53,456
Net gain on investments held in Trust Account	(4,510)	—
Changes in operating assets and liabilities:		
Prepaid expenses	9,786	(4,175)
Accounts payable	419,704	9,718
Accrued expenses	2,455,813	—
Net cash used in operating activities	(129,587)	—
Net change in cash	(129,587)	—
Cash – beginning of the period	1,299,301	—
Cash – end of the period	**$ 1,169,714**	**$ —**
Supplemental disclosure of noncash investing and financing activities:		
Offering costs included in accounts payable	$ —	$ 78,449
Offering costs included in accrued expenses	$ —	$ 326,996
Offering costs included in note payable	$ —	$ 92,856
Offering costs paid by Sponsor in exchange for issuance of Class B ordinary shares to Sponsor	$ —	$ 15,961
Use of retainer for offering costs	$ —	$ (3,271)
Change in value of Class A ordinary shares subject to possible redemption	$ 31,869,620	$ —

The accompanying notes are an integral part of these condensed financial statements.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations

Sustainable Opportunities Acquisition Corp. (the "Company") is a newly organized blank check company incorporated as a Cayman Islands exempted company on December 18, 2019. The Company was incorporated for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses or entities (the "Business Combination"). The Company is an emerging growth company and, as such, the Company is subject to all of the risks associated with emerging growth companies.

As of March 31, 2021, the Company had not commenced any operations. All activity for the period from December 18, 2019 (inception) through December 31, 2020 and the three months ended March 31, 2021 relates to the Company's formation, the initial public offering (the "Initial Public Offering"), and, since the closing of the Initial Public Offering, a search for a business combination candidate. The Company will not generate any operating revenues until after the completion of its initial Business Combination, at the earliest. The Company generates non-operating income in the form of interest income on cash from the proceeds derived from the Initial Public Offering and interest income earned on investments held in Trust Account.

Proposed Business Combination and Related Transactions

On March 4, 2021, the Company entered into a Business Combination Agreement (the "Business Combination Agreement"), by and among the Company, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub"), and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada ("DeepGreen").

Pursuant to the Business Combination Agreement, the Company will migrate to and be continued as a company in British Columbia, Canada (the "SOAC Continuance"). Following the SOAC Continuance, pursuant to a plan of arrangement (the "Plan of Arrangement") under the Business Corporations Act (British Columbia), (i) the Company will acquire all of the issued and outstanding shares in the capital of DeepGreen (the "DeepGreen Shares") from DeepGreen shareholders in exchange for the Company's ordinary shares (as defined below) and Company Earnout Shares (as defined below) (the "Share Exchange"), (ii) DeepGreen will become a wholly-owned subsidiary of the Company, and (iii) DeepGreen and NewCo Sub will amalgamate to continue as one unlimited liability company, in each case, on the terms and subject to the conditions set forth in the Business Combination Agreement and the Plan of Arrangement and in accordance with the provisions of applicable law.

Each option to purchase ordinary shares in the capital of the Company (the "DeepGreen Options") will become an option to purchase SOAC ordinary shares and Company Earnout Shares on the same terms and conditions (including applicable vesting, expiration and forfeiture provisions) that applied to the corresponding DeepGreen Options immediately prior to closing of the Business Combination.

The Proposed Business Combination is expected to close in the second quarter of 2021, following the receipt of the required approval by the Company's shareholders and the fulfillment of other conditions.

The shareholders and the optionholders of DeepGreen will be entitled to receive, in exchange for their DeepGreen Shares or DeepGreen Options, as applicable, an aggregate of (i) a number of shares in the capital of the Company or comparable equity awards that are settled or are exercisable for shares in the capital of the Company, as applicable, based on an implied DeepGreen equity value of $2.25 billion after giving effect to the SOAC Continuance (the "SOAC Ordinary shares"), (ii) 5,000,000 Class A Special Shares, (iii) 10,000,000 Class B Special Shares, (iv) 10,000,000 Class C Special Shares, (v) 20,000,000 Class D Special Shares, (vi) 20,000,000 Class E Special Shares, (vii) 20,000,000 Class F Special Shares, (viii) 25,000,000 Class G Special Shares and (ix) 25,000,000 Class H Special Shares, in each case, in the capital of the Company (collectively, the "Company Earnout Shares"), or, as applicable, options to purchase such SOAC Ordinary shares and Company Earnout Shares.

Concurrently with the execution of the Business Combination Agreement, the Company entered into subscription agreements (the "Subscription Agreements") with certain institutional and accredited investors, pursuant to which such investors agreed to subscribe for and purchase, and the Company agreed to issue and sell to

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations (cont.)

such investors, substantially concurrently with the Closing (as defined in the Business Combination Agreement), an aggregate of 33,030,000 shares of SOAC Ordinary shares for $10.00 per share, for aggregate gross proceeds of $330,300,000 (the "PIPE Financing"). The closing of the PIPE Financing is contingent upon, among other things, the substantially concurrent consummation of the Business Combination. The Subscription Agreements provide that the Company will grant the investors in the PIPE Financing certain customary registration rights. The PIPE Financing is contingent upon, among other things, the substantially concurrent closing of the Business Combination.

The Company evaluated subsequent events and transactions that occurred after the balance sheet date up to the date the financial statements were issued. Based upon this review, the Company did not identify any subsequent events that would have required adjustment or disclosure in the financial statements which have not previously been disclosed within the financial statements.

Sponsor, Initial Public Offering and Private Placement

The Company's sponsor is Sustainable Opportunities Holdings LLC, a Delaware limited liability company (the "Sponsor"). The registration statement for the Company's Initial Public Offering was declared effective on May 5, 2020. On May 8, 2020, the Company consummated its Initial Public Offering of 30,000,000 units (the "Units" and, with respect to the Class A ordinary shares included in the Units being offered, the "Public Shares") at $10.00 per Unit, generating gross proceeds of $300.0 million, and incurring offering costs of approximately $17.4 million, inclusive of $10.5 million in deferred underwriting commissions (Note 5).

Simultaneously with the closing of the Initial Public Offering, the Company consummated the private placement ("Private Placement") of 9,500,000 warrants (each, a "Private Placement Warrant" and collectively, the "Private Placement Warrants") at a price of $1.00 per Private Placement Warrant in a private placement to the Sponsor, generating gross proceeds of $9.5 million (Note 4).

Trust Account

Upon the closing of the Initial Public Offering and the Private Placement, $300.0 million ($10.00 per Unit) of the net proceeds of the sale of the Units in the Initial Public Offering and the Private Placement were placed in a trust account (the "Trust Account"), located in the United States at JP Morgan Chase Bank, N.A., with Continental Stock Transfer & Trust Company acting as trustee, and invested only in U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by the Company meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of the Investment Company Act, as determined by the Company, until the earlier of: (i) the completion of a Business Combination and (ii) the distribution of the Trust Account as described below.

Initial Business Combination

The Company's management has broad discretion with respect to the specific application of the net proceeds of the Initial Public Offering and the sale of Private Placement Warrants, although substantially all of the net proceeds are intended to be applied generally toward consummating a Business Combination. There is no assurance that the Company will be able to complete a Business Combination successfully. The Company must complete one or more initial Business Combinations having an aggregate fair market value of at least 80% of the assets held in the Trust Account (as defined below) (excluding the deferred underwriting commissions and taxes payable on income earned on the Trust Account) at the time of the signing of the agreement to enter into the initial Business Combination. However, the Company will only complete a Business Combination if the post-transaction company owns or acquires 50% or more of the outstanding voting securities of the target or otherwise acquires a controlling interest in the target sufficient for it not to be required to register as an investment company under the Investment Company Act 1940, as amended (the "Investment Company Act").

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations (cont.)

The Company will provide the holders (the "Public Shareholders") of its Class A ordinary shares, par value $0.0001 per share sold in the Initial Public Offering (the "Public Shares") with the opportunity to redeem all or a portion of their Public Shares upon the completion of a Business Combination either (i) in connection with a shareholder meeting called to approve the Business Combination or (ii) by means of a tender offer. The decision as to whether the Company will seek shareholder approval of a Business Combination or conduct a tender offer will be made by the Company, solely in its discretion. The Public Shareholders will be entitled to redeem their Public Shares for a pro rata portion of the amount then in the Trust Account (initially anticipated to be $10.00 per Public Share). The per-share amount to be distributed to Public Shareholders who redeem their Public Shares will not be reduced by the deferred underwriting commissions the Company will pay to the underwriter (as discussed in Note 5). These Public Shares will be recorded at a redemption value and classified as temporary equity upon the completion of the Initial Public Offering in accordance with the Financial Accounting Standards Board's ("FASB") Accounting Standards Codification ("ASC") Topic 480 "Distinguishing Liabilities from Equity." In such case, the Company will proceed with a Business Combination if the Company has net tangible assets of at least $5,000,001 upon such consummation of a Business Combination and a majority of the shares voted are voted in favor of the Business Combination. If a shareholder vote is not required by law and the Company does not decide to hold a shareholder vote for business or other legal reasons, the Company will, pursuant to the amended and restated memorandum and articles of association, which the Company adopted upon the consummation of the Initial Public Offering (the "Amended and Restated Memorandum and Articles of Association") conduct the redemptions pursuant to the tender offer rules of the U.S. Securities and Exchange Commission ("SEC") and file tender offer documents with the SEC prior to completing a Business Combination. If, however, shareholder approval of the transactions is required by law, or the Company decides to obtain shareholder approval for business or legal reasons, the Company will offer to redeem shares in conjunction with a proxy solicitation pursuant to the proxy rules and not pursuant to the tender offer rules. Additionally, each Public Shareholder may elect to redeem their Public Shares irrespective of whether they vote for or against the proposed transaction. If the Company seeks shareholder approval in connection with a Business Combination, the Initial Shareholders (as defined below) have agreed to vote their Founder Shares (as defined below in Note 4) and any Public Shares purchased during or after the Initial Public Offering in favor of a Business Combination. In addition, the Initial Shareholders have agreed to waive their redemption rights with respect to their Founder Shares and Public Shares in connection with the completion of a Business Combination.

Notwithstanding the foregoing, the Amended and Restated Memorandum and Articles of Association provide that a Public Shareholder, together with any affiliate of such shareholder or any other person with whom such shareholder is acting in concert or as a "group" (as defined under Section 13 of the Securities Exchange Act of 1934, as amended (the "Exchange Act")), will be restricted from redeeming its shares with respect to more than an aggregate of 15% or more of the Class A ordinary shares sold in the Initial Public Offering, without the prior consent of the Company.

The Company's Sponsor, officers and directors (the "Initial Shareholders") have agreed not to propose an amendment to the Amended and Restated Memorandum and Articles of Association that would affect the substance or timing of the Company's obligation to provide holders of its Public Shares the right to have their shares redeemed in connection with its initial business combination or to redeem 100% of its Public Shares if the Company does not complete a Business Combination within 18 months from the closing of the Initial Public Offering, or November 8, 2021 (the "Combination Period") unless the Company provides the Public Shareholders with the opportunity to redeem their Class A ordinary shares in conjunction with any such amendment.

If the Company is unable to complete a Business Combination within the Combination Period, the Company will: (i) cease all operations except for the purpose of winding up; (ii) as promptly as reasonably possible but not more than ten business days thereafter, redeem the Public Shares, at a per-share price, payable in cash, equal to the aggregate amount then on deposit in the Trust Account, including interest earned on the funds held in the Trust Account and not previously released to the Company to pay for its tax obligations, if any (less up to $100,000 of interest to pay dissolution expenses) divided by the number of the then-outstanding Public Shares, which redemption will completely extinguish Public Shareholders' rights as shareholders (including the right to receive further liquidation distributions, if any); and (iii) as promptly as reasonably possible following such redemption, subject to

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 1 — Description of Organization and Business Operations (cont.)

the approval of the remaining shareholders and the Company's board of directors, liquidate and dissolve, subject in the case of clauses (ii) and (iii), to the Company's obligations under Cayman Islands law to provide for claims of creditors and the requirements of other applicable law.

The Initial Shareholders have agreed to waive their liquidation rights with respect to the Founder Shares if the Company fails to complete a Business Combination within the Combination Period. However, if the Initial Shareholders acquire Public Shares in or after the Initial Public Offering, they will be entitled to liquidating distributions from the Trust Account with respect to such Public Shares if the Company fails to complete a Business Combination within the Combination Period. The underwriter has agreed to waive its rights to its deferred underwriting commission (see Note 5) held in the Trust Account in the event the Company does not complete a Business Combination within the Combination Period and, in such event, such amounts will be included with the other funds held in the Trust Account that will be available to fund the redemption of the Public Shares. In the event of such distribution, it is possible that the per share value of the residual assets remaining available for distribution (including Trust Account assets) will be only $10.00 per share initially held in the Trust Account. In order to protect the amounts held in the Trust Account, the Sponsor has agreed to be liable to the Company if and to the extent any claims by a third party for services rendered or products sold to the Company, or a prospective target business with which the Company has discussed entering into a transaction agreement, reduce the amount of funds in the Trust Account. This liability will not apply with respect to any claims by a third party who executed a waiver of any right, title, interest or claim of any kind in or to any monies held in the Trust Account or to any claims under the Company's indemnity of the underwriter of the Initial Public Offering against certain liabilities, including liabilities under the Securities Act of 1933, as amended (the "Securities Act"). Moreover, in the event that an executed waiver is deemed to be unenforceable against a third party, the Sponsor will not be responsible to the extent of any liability for such third party claims. The Company will seek to reduce the possibility that the Sponsor will have to indemnify the Trust Account due to claims of creditors by endeavoring to have all vendors, service providers, prospective target businesses or other entities with which the Company does business, execute agreements with the Company waiving any right, title, interest or claim of any kind in or to monies held in the Trust Account.

Going Concern Consideration

As of March 31, 2021, the Company had approximately $1.2 million in cash and a working capital deficit of approximately $3.4 million.

Until the consummation of a Business Combination, the Company will be using the funds not held in the Trust Account for identifying and evaluating prospective acquisition candidates, performing due diligence on prospective target businesses, paying for travel expenditures, selecting the target business to acquire, and structuring, negotiating and consummating the Business Combination. The Company will need to raise additional capital through loans or additional investments from its Sponsor, stockholders, officers, directors, or third parties. The Company's officers, directors and Sponsor may, but are not obligated to, loan the Company funds, from time to time or at any time, in whatever amount they deem reasonable in their sole discretion, to meet the Company's working capital needs. Accordingly, the Company may not be able to obtain additional financing. If the Company is unable to raise additional capital, it may be required to take additional measures to conserve liquidity, which could include, but not necessarily be limited to, curtailing operations, suspending the pursuit of a potential transaction, and reducing overhead expenses.

The Company cannot provide any assurance that new financing will be available to it on commercially acceptable terms, if at all. These conditions raise substantial doubt about the Company's ability to continue as a going concern through November 8, 2021. These financial statements do not include any adjustments relating to the recovery of the recorded assets or the classification of the liabilities that might be necessary should the Company be unable to continue as a going concern.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 2 — Summary of Significant Accounting Policies

Basis of Presentation

The accompanying unaudited condensed financial statements are presented in U.S. dollars in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP") for interim financial information and pursuant to the rules and regulations of the SEC. Accordingly, they do not include all of the information and footnotes required by GAAP. In the opinion of management, the unaudited consolidated financial statements reflect all adjustments, which include only normal recurring adjustments necessary for the fair statement of the balances and results for the periods presented. Operating results for the period for the three months ended March 31, 2021 are not necessarily indicative of the results that may be expected for the year ending December 31, 2021 or for any future interim periods.

The accompanying unaudited consolidated financial statements should be read in conjunction the financial statements and notes thereto included in with the Company's Annual Report as amended on Form 10-K/A for the year ended December 31, 2020 as filed with the SEC on May 24, 2021.

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly-owned subsidiary. All significant intercompany balances and transactions have been eliminated in consolidation. Activities in relation to the noncontrolling interest are not considered to be significant and are, therefore, not presented in the accompanying consolidated financial statements.

Emerging Growth Company

The Company is an "emerging growth company," as defined in Section 2(a) of the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"), and it may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, reduced disclosure obligations regarding executive compensation in its periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

Further, Section 102(b)(1) of the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act") exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies (that is, those that have not had a Securities Act registration statement declared effective or do not have a class of securities registered under the Exchange Act) are required to comply with the new or revised financial accounting standards. The JOBS Act provides that an emerging growth company can elect to opt out of the extended transition period and comply with the requirements that apply to non-emerging growth companies but any such an election to opt out is irrevocable. The Company has elected not to opt out of such extended transition period, which means that when a standard is issued or revised and it has different application dates for public or private companies, the Company, as an emerging growth company, can adopt the new or revised standard at the time private companies adopt the new or revised standard.

This may make comparison of the Company's financial statements with other public companies difficult or impossible because of the potential differences in accounting standards used.

Use of Estimates

The preparation of the financial statements in conformity with U.S. GAAP requires the Company's management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date the financial statements and the reported amounts of expenses during the reporting periods. Actual results could differ from those estimates.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 2 — Summary of Significant Accounting Policies (cont.)

Making estimates requires management to exercise significant judgment. It is at least reasonably possible that the estimate of the effect of a condition, situation or set of circumstances that existed at the date of the financial statements, which management considered in formulating its estimate, could change in the near term due to one or more future confirming events. Accordingly, the actual results could differ significantly from those estimates.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist of cash accounts in a financial institution, which, at times, may exceed the Federal Depository Insurance Coverage of $250,000 and investments held in Trust Account. The Company has not experienced losses on these accounts.

Cash and Cash Equivalents

The Company considers all short-term investments with an original maturity of three months or less when purchased to be cash equivalents. The Company had no cash equivalents as of March 31, 2021 and December 31, 2020, respectively.

Investments Held in Trust Account

The Company's portfolio of marketable securities is comprised solely of U.S. government securities, within the meaning set forth in Section 2(a)(16) of the Investment Company Act, with a maturity of 185 days or less or in any open-ended investment company that holds itself out as a money market fund selected by the Company meeting the conditions of paragraphs (d)(2), (d)(3) and (d)(4) of Rule 2a-7 of the Investment Company Act. Upon the closing of the Initial Public Offering and the Private Placement, $300 million was placed in the Trust Account and invested in money market funds that invest in U.S. government securities. All of the Company's investments held in the Trust Account are classified as trading securities. Trading securities are presented on the balance sheet at fair value at the end of each reporting period. Gains and losses resulting from the change in fair value of investments held in Trust Account are included in net gain on investments held in Trust Account in the accompanying statement of operations. The estimated fair values of investments held in Trust Account are determined using available market information.

Fair Value Measurement

Fair value is defined as the price that would be received for sale of an asset or paid for transfer of a liability, in an orderly transaction between market participants at the measurement date. U.S. GAAP establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value.

The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). These tiers include:

- Level 1, defined as observable inputs such as quoted prices for identical instruments in active markets;
- Level 2, defined as inputs other than quoted prices in active markets that are either directly or indirectly observable such as quoted prices for similar instruments in active markets or quoted prices for identical or similar instruments in markets that are not active; and
- Level 3, defined as unobservable inputs in which little or no market data exists, therefore requiring an entity to develop its own assumptions, such as valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

In some circumstances, the inputs used to measure fair value might be categorized within different levels of the fair value hierarchy. In those instances, the fair value measurement is categorized in its entirety in the fair value hierarchy based on the lowest level input that is significant to the fair value measurement.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 2 — Summary of Significant Accounting Policies (cont.)

Fair Value of Financial Instruments

As of March 31, 2021 and December 31, 2020, the carrying values of cash, prepaid expenses, and accounts payable approximate their fair values due to the short-term nature of the instruments. As of March 31, 2021, the Company's portfolio of investments held in Trust Account is comprised entirely of investments in money market funds that invest in U.S. government securities.

The Warrants are accounted for as liabilities pursuant to ASC 815-40 and are measured at fair value as of each reporting period. Changes in the fair value of the Warrants are recorded in the statement of operations each period.

Warrant Liabilities

The Company does not use derivative instruments to hedge exposures to cash flow, market, or foreign currency risks. The Company evaluates all of its financial instruments, including issued stock purchase warrants, to determine if such instruments are derivatives or contain features that qualify as embedded derivatives, pursuant to ASC 480 and ASC 815-15. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period.

The Company issued 15,000,000 warrants as part of the units offered in its Initial Public Offering and, simultaneously with the closing of Initial Public Offering, the Company issued in a private placement an aggregate of 9,500,000 private placement warrants. The Company accounts for the Warrants in accordance with the guidance contained in ASC 815-40 under which the Warrants do not meet the criteria for equity treatment and must be recorded as liabilities. Accordingly, the Company classifies the Warrants as liabilities at their fair value and adjusts the warrants to fair value at each reporting period. This liability is subject to re-measurement at each balance sheet date until exercised, and any change in fair value is recognized in the Company's statement of operations. The fair value of the Public Warrants has been estimated using the Public Warrants' quoted market price. The Private Placement Warrants are valued using a Modified Black Scholes Option Pricing Model.

Class A Ordinary Shares subject to possible redemption

Class A ordinary shares subject to mandatory redemption (if any) are classified as liability instruments and are measured at fair value. Conditionally redeemable Class A ordinary shares (including Class A ordinary shares that feature redemption rights that are either within the control of the holder or subject to redemption upon the occurrence of uncertain events not solely within the Company's control) are classified as temporary equity. At all other times, Class A ordinary shares are classified as shareholders' equity. The Company's Class A ordinary shares feature certain redemption rights that are considered to be outside of the Company's control and subject to occurrence of uncertain future events. Accordingly, as of March 31, 2021, 25,913,683 Class A ordinary shares subject to possible redemption were presented at redemption value as temporary equity, outside of the shareholders' equity section of the Company's balance sheet.

Net Income (Loss) Per Ordinary Share

The Company applies the two-class method in calculating earnings per share. Net income (loss) per share is computed by dividing net income (loss) by the weighted-average number of ordinary shares outstanding during the periods. An aggregate of 25,913,683 and 22,726,721 Class A ordinary shares subject to possible redemption at March 31, 2021 and December 31, 2020, respectively have been excluded from the calculation of basic loss per ordinary share, since such shares, if redeemed, only participate in their pro rata share of the Trust earnings. The Company has not considered the effect of the warrants sold in the Initial Public Offering and Private Placement to purchase an aggregate of 24,500,000 Class A ordinary shares in the calculation of diluted loss per ordinary share, since the exercise of the warrants are contingent upon the occurrence of future events. As a result, diluted net income (loss) per ordinary share is the same as basic net income (loss) per ordinary share for the periods presented.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 2 — Summary of Significant Accounting Policies (cont.)

Reconciliation of Net Income (Loss) per Ordinary Share

The Company's net income (loss) is adjusted for the portion of income (loss) that is attributable to ordinary shares subject to redemption, as these shares only participate in the earnings of the Trust Account and not the income or losses of the Company. Accordingly, basic and diluted loss per ordinary share is calculated as follows:

	For the three months ended March 31, 2021	For the three months ended March 31, 2020
Class A Ordinary Shares subject to possible redemption		
Numerator: Earnings allocable to Ordinary Shares subject to possible redemption		
Income from investments held in Trust Account	$ 4,510	$ —
Less: Company's portion available to be withdrawn to pay taxes	—	—
Net income attributable to ordinary shares subject to possible redemption	$ 4,510	$ —
Denominator: Weighted average Class A ordinary shares subject to possible redemption		
Weighted average shares outstanding subject to redemption, basic and diluted	22,762,132	—
Basic and diluted net income per share, shares subject to redemption	$ 0.00	$ —
Non-Redeemable Ordinary Shares		
Numerator: Net Income (Loss) minus Net Earnings attributable to redeemable shares		
Net income (loss)	$ 31,869,620	$ (58,999)
Less: Income attributable to Class A ordinary shares subject to possible redemption	(4,510)	—
Non-redeemable net income (loss)	$ 31,865,110	$ (58,999)
Denominator: weighted average Non-redeemable ordinary shares		
Weighted average ordinary shares outstanding, basic and diluted	14,737,868	7,500,000
Basic and diluted net income (loss) per share, Non-redeemable shares	$ 2.16	$ (0.01)

Income Taxes

FASB ASC Topic 740, "Income Taxes," prescribes a recognition threshold and a measurement attribute for the financial statement recognition and measurement of tax positions taken or expected to be taken in a tax return. For those benefits to be recognized, a tax position must be more likely than not to be sustained upon examination by taxing authorities. There were no unrecognized tax benefits as of March 31, 2021 and December 31, 2020. The Company's management determined that the Cayman Islands is the Company's only major tax jurisdiction. The Company recognizes accrued interest and penalties related to unrecognized tax benefits as income tax expense. No amounts were accrued for the payment of interest and penalties as of March 31, 2021 and December 31, 2020. The Company is currently not aware of any issues under review that could result in significant payments, accruals or material deviation from its position. The Company is subject to income tax examinations by major taxing authorities since inception.

There is currently no taxation imposed on income by the Government of the Cayman Islands. In accordance with Cayman Islands income tax regulations, income taxes are not levied on the Company. Consequently, income taxes are not reflected in the Company's financial statements. The Company's management does not expect that the total amount of unrecognized tax benefits will materially change over the next twelve months.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 2 — Summary of Significant Accounting Policies (cont.)

Recent Accounting Standards

The Company's management does not believe that any recently issued, but not yet effective, accounting pronouncements, if currently adopted, would have a material effect on the Company's financial statements.

Note 3 — Initial Public Offering

On May 8, 2020, the Company consummated its Initial Public Offering of 30,000,000 Units at $10.00 per Unit, generating gross proceeds of $300 million, and incurring offering costs of approximately $17.4 million, inclusive of $10.5 million in deferred underwriting commissions. Each Unit consists of one Class A ordinary share and one-half of one redeemable warrant (each, a "Public Warrant"). Each Public Warrant entitles the holder to purchase one Class A ordinary share at a price of $11.50 per share, subject to adjustment (see Note 6).

Note 4 — Related Party Transactions

Founder Shares

On December 31, 2019, the Sponsor purchased 8,625,000 shares (the "Founder Shares") of the Company's Class B ordinary shares, par value $0.0001 for an aggregate price of $25,000. In March 2020, the Sponsor transferred 30,000 Founder Shares to each of the Company's independent directors. The Founder Shares will automatically convert into Class A ordinary shares at the time of the Company's initial Business Combination and are subject to certain transfer restrictions, as described in Note 6. The Sponsor had agreed to forfeit up to 1,125,000 Founder Shares to the extent that the over-allotment option was not exercised in full by the underwriter so that the Founder Shares will represent 20.0% of the Company's issued and outstanding shares after the Initial Public Offering. The over-allotment option expired in June 2020; thus, these Founder Shares were forfeited accordingly.

The Initial Shareholders agreed, subject to limited exceptions, not to transfer, assign or sell any of their Founder Shares until the earlier to occur of: (A) one year after the completion of the initial Business Combination or (B) subsequent to the initial Business Combination, (x) if the last sale price of the Class A ordinary shares equals or exceeds $12.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after the initial Business Combination, or (y) the date on which the Company completes a liquidation, merger, share exchange or other similar transaction that results in all of the Company's shareholders having the right to exchange their Class A ordinary shares for cash, securities or other property.

Private Placement Warrants

Simultaneously with the closing of the Initial Public Offering, the Company consummated the Private Placement of 9,500,000 Private Placement Warrants at a price of $1.00 per Private Placement Warrant to the Sponsor, generating gross proceeds of $9.5 million. Each Private Placement Warrant is exercisable for one whole Class A ordinary share at a price of $11.50 per share.

A portion of the proceeds from the sale of the Private Placement Warrants was added to the proceeds from the Initial Public Offering held in the Trust Account. If the Company does not complete a Business Combination within the Combination Period, the Private Placement Warrants will expire worthless. The Private Placement Warrants will be non-redeemable and exercisable on a cashless basis so long as they are held by the Sponsor or its permitted transferees.

The Sponsor and the Company's officers and directors agreed, subject to limited exceptions, not to transfer, assign or sell any of their Private Placement Warrants until 30 days after the completion of the initial Business Combination.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 4 — Related Party Transactions (cont.)

Related Party Loans

On December 31, 2019, the Sponsor agreed to loan the Company an aggregate of up to $300,000 to cover expenses related to the Initial Public Offering pursuant to a promissory note (the "Note"). This loan was non-interest bearing and payable upon the completion of the Initial Public Offering. The Company borrowed approximately $163,000 under the Note and fully repaid this amount on May 8, 2020.

In addition, in order to finance transaction costs in connection with a Business Combination, the Sponsor or an affiliate of the Sponsor, or certain of the Company's officers and directors may, but are not obligated to, loan the Company funds as may be required ("Working Capital Loans"). If the Company completes a Business Combination, the Company would repay the Working Capital Loans out of the proceeds of the Trust Account released to the Company. Otherwise, the Working Capital Loans would be repaid only out of funds held outside the Trust Account. In the event that a Business Combination does not close, the Company may use a portion of the proceeds held outside the Trust Account to repay the Working Capital Loans but no proceeds held in the Trust Account would be used to repay the Working Capital Loans. Except for the foregoing, the terms of such Working Capital Loans, if any, have not been determined and no written agreements exist with respect to such loans. The Working Capital Loans would either be repaid upon consummation of a Business Combination, without interest, or, at the lender's discretion, up to $1.5 million of such Working Capital Loans may be convertible into warrants of the post Business Combination entity at a price of $1.00 per warrant. The warrants would be identical to the Private Placement Warrants. As of March 31, 2021, the Company had no borrowings under the Working Capital Loans.

Administrative Support Agreement

The Company entered into an agreement, commencing on May 8, 2020 through the earlier of the Company's consummation of a Business Combination and its liquidation, to reimburse the Sponsor a total of $10,000 per month for office space, secretarial and administrative services. The Company incurred and paid $30,000 and $0 in expenses in connection with such services and recorded in general and administrative expenses in the statements of operations for the three months ended March 31, 2021, and 2020, respectively.

Note 5 — Commitments & Contingencies

Registration and Shareholder Rights

The holders of Founder Shares, Private Placement Warrants and warrants that may be issued upon conversion of Working Capital Loans, if any, will be entitled to registration rights (in the case of the Founder Shares, only after conversion of such shares to Class A ordinary shares) pursuant to a registration and shareholder rights agreement. These holders will be entitled to certain demand and "piggyback" registration rights. However, the registration and shareholder rights agreement provides that the Company will not permit any registration statement filed under the Securities Act to become effective until the termination of the applicable lock-up period for the securities to be registered. The Company will bear the expenses incurred in connection with the filing of any such registration statements.

Underwriting Agreement

The Company granted the underwriter a 45-day option from the date of the final prospectus relating to the Initial Public Offering to purchase up to 4,500,000 additional Units to cover over-allotments, if any, at $10.00 per Unit, less the underwriting discounts and commissions. The over-allotment option expired in June 2020.

The underwriter was entitled to an underwriting discount of $0.20 per unit, or $6.0 million in the aggregate paid upon the closing of the Initial Public Offering. In addition, $0.35 per unit, or $10.5 million in the aggregate will be payable to the underwriter for deferred underwriting commissions. The deferred underwriting commissions will become payable to the underwriter from the amounts held in the Trust Account solely in the event that the Company completes a Business Combination, subject to the terms of the underwriting agreement.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 5 — Commitments & Contingencies (cont.)

Consulting Agreement

The Company is receiving consulting services in connection with identification of potential targets for a Business Combination and due diligence on such targets. As compensation for such services, the Company paid a nonrefundable fixed fee of $350,000 and agreed to pay the consulting firm $2,650,000 solely in the event that the Company completes a Business Combination. The consulting agreement may be terminated early by either party to the agreement provided that the Company pays a termination fee to the consulting firm determined based on a monthly increasing amount through November 2021. The Company recognized $418,000 and $0 in general and administrative expenses within the statements of operations for the three months ended March 31, 2021 and March 31, 2020, respectively. The termination fee accrued was $1,533,800 and $1,115,800 as of March 31, 2021 and December 31, 2020, respectively.

Note 6 — Shareholders' Equity

Preference Shares

The Company is authorized to issue 1,000,000 preference shares with such designations, voting and other rights and preferences as may be determined from time to time by the Company's board of directors. As of March 31, 2021 and December 31, 2020, there were no preference shares issued or outstanding.

Ordinary Shares

Class A Ordinary Shares — The Company is authorized to issue 300,000,000 Class A ordinary shares with a par value of $0.0001 per share. As of March 31, 2021 and December 31, 2020, there were 30,000,000 Class A ordinary shares outstanding, including 25,913,683 and 22,726,721 Class A ordinary shares subject to possible redemption classified as temporary equity in the accompanying balance sheets, respectively.

Class B Ordinary Shares — The Company is authorized to issue 30,000,000 Class B ordinary shares with a par value of $0.0001 per share. Holders of Class B ordinary shares are entitled to one vote for each share. As of March 31, 2021 and December 31, 2020, there were 7,500,000 Class B ordinary shares outstanding.

Holders of the Class A ordinary shares and holders of the Class B ordinary shares will vote together as a single class on all matters submitted to a vote of the Company's shareholders except as required by law.

The Class B ordinary shares will automatically convert into Class A ordinary shares at the time of the initial Business Combination at a ratio such that the number of Class A ordinary shares issuable upon conversion of all Founder Shares will equal, in the aggregate, on an as-converted basis, 20% of the sum of (i) the total number of ordinary shares issued and outstanding upon completion of the Initial Public Offering, plus (ii) the total number of Class A ordinary shares issued or deemed issued or issuable upon conversion or exercise of any equity-linked securities or rights issued or deemed issued, by the Company in connection with or in relation to the consummation of the initial Business Combination, excluding any Class A ordinary shares or equity-linked securities exercisable for or convertible into Class A ordinary shares issued, or to be issued, to any seller in the initial Business Combination and any Private Placement Warrants issued to the Sponsor upon conversion of Working Capital Loans. Any conversion of Class B ordinary shares will take effect as a compulsory redemption of Class B ordinary shares and an issuance of Class A ordinary shares as a matter of Cayman Islands law. In no event will the Class B ordinary shares convert into Class A ordinary shares at a rate of less than one-to-one.

Note 7 — Fair Value Measurements

The Company follows the guidance in ASC 820 for its financial assets and liabilities that are re-measured and reported at fair value at each reporting period, and non-financial assets and liabilities that are re-measured and reported at fair value at least annually.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 7 — Fair Value Measurements (cont.)

As of March 31, 2021 the carrying values of cash, prepaid expenses, and accounts payable approximate their fair values due to the short-term nature of the instruments. As of March 31, 2021, the Company's portfolio of investments held in Trust Account is comprised entirely of investments in money market funds that invest in U.S. government securities.

The Warrants are accounted for as liabilities pursuant to ASC 815-40 and are measured at fair value as of the reporting period. Changes in the fair value of the Warrants are recorded in the statement of operations each period.

The following table presents our fair value hierarchy for liabilities measured at fair value on a recurring basis as of March 31, 2021:

March 31, 2021

	Level 1	Level 2	Level 3	Total
Warrant liabilities:				
Public Warrants	$ 13,500,000	$ —	$ —	$ 13,500,000
Private Placement Warrants	—	—	8,550,000	8,550,000
Total warrant liabilities	$ 13,500,000	$ —	$ 8,550,000	$ 22,050,000

The Private Placement Warrants were valued using a modified Black Scholes Model including inputs from a Monte Carlo simulation, which is considered to be a Level 3 fair value measurement. The Monte Carlo simulation's primary unobservable input utilized in determining the fair value of the Warrants is the probability of consummation of the Business Combination. The probability assigned to the consummation of the Business Combination was 88% which was estimated based on the observed success rates of business combinations for special purpose acquisition companies.

The following table provides quantitative information regarding Level 3 fair value measurements inputs at their measurement dates:

	As of March 31, 2021	As of December 31, 2020
Exercise price	$ 11.50	$ 11.50
Implied stock price range (or underlying asset price at December 31, 2020)	$ 9.9310.76	$ 10.769.93
Volatility	1530.5%	3015.5%
Term	5.25	5.25
Risk-free rate	0.98%	0.4098%
Dividend yield	0.0%	0.0%

The following table presents the changes in the fair value of warrant liabilities:

	Private Placement	Public	Warrant Liabilities
Fair value, December 31, 2020	$ 23,180,000	$ 33,750,000	$ 56,930,000
Recognized income on change in fair value	(14,630,000)	(20,250,000)	(34,880,000)
Fair value, March 31, 2021	$ 8,550,000	$ 13,500,000	$ 22,050,000

Note 8 — Warrant Liability

Warrants

Public Warrants may only be exercised for a whole number of shares. No fractional Public Warrants will be issued upon separation of the Units and only whole Public Warrants will trade. The Public Warrants will become exercisable on the later of (a) 30 days after the completion of a Business Combination or (b) 12 months from the

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 8 — Warrant Liability (cont.)

closing of the Initial Public Offering; provided in each case that the Company has an effective registration statement under the Securities Act covering the issuance of the Class A ordinary shares issuable upon exercise of the warrants and a current prospectus relating to them is available and such shares are registered, qualified or exempt from registration under the securities, or blue sky, laws of the state of residence of the holder (or the Company permits holders to exercise their warrants on a cashless basis under certain circumstances). The Company has agreed that as soon as practicable, but in no event later than 20 business days, after the closing of a Business Combination, the Company will use its commercially reasonable efforts to file with the SEC a registration statement covering the Class A ordinary shares issuable upon exercise of the warrants and to maintain a current prospectus relating to those Class A ordinary shares until the warrants expire or are redeemed. If a registration statement covering the Class A ordinary shares issuable upon exercise of the warrants is not effective by the 60th day after the closing of the initial Business Combination, warrant holders may, until such time as there is an effective registration statement and during any period when the Company will have failed to maintain an effective registration statement, exercise warrants on a "cashless basis" in accordance with Section 3(a)(9) of the Securities Act or another exemption. The Public Warrants will expire five years after the completion of a Business Combination or earlier upon redemption or liquidation.

Each whole Public Warrant entitles the holder to purchase one Class A ordinary share at a price of $11.50 per share. If (x) the Company issues additional Class A ordinary shares or equity-linked securities for capital raising purposes in connection with the closing of the initial Business Combination at an issue price or effective issue price of less than $9.20 per ordinary share (with such issue price or effective issue price to be determined in good faith by the Company and, (i) in the case of any such issuance to the Sponsor or its affiliates, without taking into account any Founder Shares held by the Sponsor or such affiliates, as applicable, prior to such issuance, and (ii) without taking into account the transfer of Founder Shares or Private Placement Warrants (including if such transfer is effectuated as a surrender to us and subsequent reissuance by the Company) by the Sponsor in connection with such issuance) (the "Newly Issued Price"), (y) the aggregate gross proceeds from such issuances represent more than 60% of the total equity proceeds, and interest thereon, available for the funding of the initial Business Combination on the date of the consummation of the initial Business Combination (net of redemptions), and (z) the volume weighted average trading price of the Company's Class A ordinary shares during the 20-trading day period starting on the trading day prior to the day on which the Company consummates its initial Business Combination (such price, the "Market Value") is below $9.20 per share, the exercise price of the warrants will be adjusted (to the nearest cent) to be equal to 115% of the higher of the Market Value and the Newly Issued Price, and the $18.00 per share redemption trigger price discussed below will be adjusted (to the nearest cent) to be equal to 180% of the higher of the Market Value and the Newly Issued Price.

The Company may call the Public Warrants for redemption (except with respect to the Private Placement Warrants):

- in whole and not in part;
- at a price of $0.01 per warrant;
- upon a minimum of 30 days' prior written notice of redemption, and
- if, and only if, the closing price of the Company's Class A ordinary shares equals or exceeds $18.00 per share (as adjusted for share subdivisions, share capitalizations, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date on which the Company sends the notice of redemption to the warrant holders.

If the Company calls the Public Warrants for redemption, management will have the option to require all holders that wish to exercise the Public Warrants to do so on a "cashless basis," as described in the warrant agreement.

The Private Placement Warrants are identical to the Public Warrants underlying the Units sold in the Initial Public Offering, except that the Private Placement Warrants and the ordinary shares issuable upon exercise of the Private Placement Warrants will not be transferable, assignable or salable until 30 days after the completion of a

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
NOTES TO CONDENSED FINANCIAL STATEMENTS

Note 8 — Warrant Liability (cont.)

Business Combination, subject to certain limited exceptions. Additionally, the Private Placement Warrants will be non-redeemable so long as they are held by the initial purchasers or such purchasers' permitted transferees. If the Private Placement Warrants are held by someone other than the Initial Shareholders or their permitted transferees, the Private Placement Warrants will be redeemable by the Company and exercisable by such holders on the same basis as the Public Warrants.

Additionally, in no event will the Company be required to net cash settle any Warrants. If the Company is unable to complete the initial Business Combination within the Combination Period and the Company liquidates the funds held in the Trust Account, holders of warrants will not receive any of such funds with respect to their warrants, nor will they receive any distribution from the Company's assets held outside of the Trust Account with the respect to such warrants. Accordingly, the warrants may expire worthless.

Note 9 — Subsequent Events

The Company has evaluated subsequent events and transactions that occurred after the balance sheet date up to the date that the financial statements were issued. Based upon this review, other than as described in these financial statements, the Company did not identify any subsequent events that would have required adjustment or disclosure in the financial statements.

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of DeepGreen Metals Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of DeepGreen Metals Inc. (the "Company") as of December 31, 2020 and 2019, the related consolidated statements of loss and comprehensive loss, changes in shareholders' equity and cash flows for the years then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (the "PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2012.
Vancouver, Canada
March 26, 2021

DeepGreen Metals Inc.
Consolidated Balance Sheets
US Dollars

	Note	As at December 31 2020 $	As at December 31 2019 $
ASSETS			
Current			
Cash and cash equivalents	5	**10,096,205**	15,950,624
Receivables and prepayments	6	**128,772**	72,396
		10,224,977	16,023,020
Non-current			
Exploration licenses	8	**43,150,319**	448,855
Equipment	7	**1,309,677**	1,851,586
		44,459,996	2,300,441
TOTAL ASSETS		**54,684,973**	18,323,461
LIABILITIES			
Current			
Accounts payable and accrued liabilities	8,11	**4,315,477**	1,802,514
Deferred acquisition costs	3	**3,440,000**	—
		7,755,477	1,802,514
Non-current			
Contribution from Strategic Service Provider	8	**—**	8,333,335
Deferred tax liability	15	**10,675,366**	—
		18,430,843	10,135,849
EQUITY			
Common shares ***(unlimited shares, no par value – issued: 163,658,134 (2019 – 141,063,316)***	9	**154,431,291**	79,824,445
Preferred shares ***(unlimited share, no par value – issued: 440,000 (2019 – 440,000)***	9	**550,000**	550,000
Additional Paid in Capital		**45,346,696**	35,255,520
Accumulated other comprehensive loss		**(1,215,659)**	(1,215,534)
Deficit		**(162,858,198)**	(106,226,819)
		36,254,130	8,187,612
TOTAL LIABILITIES AND EQUITY		**54,684,973**	18,323,461

Nature of Operations *(Note 1)*
Commitments *(Note 12)*
Subsequent Events *(Note 16)*

"Gerard Barron", Director

"Paul Matysek", Director

See accompanying notes

DeepGreen Metals Inc.
Consolidated Statements of Loss and Comprehensive Loss
US Dollars (except weighted average number of shares outstanding)

	Note	For the year ended December 31 2020 $	For the year ended December 31 2019 $
Operating expenses			
Exploration expenses	8	**48,881,445**	38,830,228
Consulting fees		**1,385,882**	820,665
Investor relations		**857,810**	1,221,153
Office and sundry		**303,006**	236,360
Professional fees		**663,293**	248,211
Salaries and wages		**915,855**	741,355
Director fees		**195,101**	497,368
Common Share options-based payments	10	**3,263,131**	401,926
Transfer agent and filing fees		**6,023**	2,536
Travel		**132,821**	298,921
		56,604,367	43,298,723
Other items			
Foreign exchange loss		**80,447**	73,951
Interest income		**(53,435)**	(300,303)
Loss for the year		**56,631,379**	43,072,371
Other comprehensive income to be reclassified to profit and loss in subsequent periods			
Currency translation differences		**125**	34
Comprehensive loss for the year		**56,631,504**	43,072,405
Loss per share – Basic and diluted		**0.37**	0.33
Weighted average number of common shares outstanding		**154,224,664**	131,308,417

See accompanying notes

DeepGreen Metals Inc.
Consolidated Statements of Cash Flows
US Dollars

	Note	For the year ended December 31 2020 $	For the year ended December 31 2019 $
Cash resources provided by (used in)			
Operating activities			
Loss for the year		**(56,631,379)**	(43,072,371)
Items not affecting cash:			
Amortization		**563,183**	339,441
Expenses settled in share-based payments	8,10	**27,097,603**	27,018,640
Unrealized foreign exchange		**7,995**	1,079
Changes in non-cash working capital			
Receivables and prepayments		**(109,811)**	(241,771)
Accounts payable and accrued liabilities		**2,487,398**	589,410
Interest received		**53,435**	287,431
		(26,531,576)	(15,078,141)
Investing activities			
Acquisition of exploration license	3	**(607,375)**	—
Acquisition of equipment	7	**—**	(2,123,475)
		(607,375)	(2,123,475)
Financing activities			
Exercise of stock options	10	**919,465**	350,000
Proceeds from issuance of common shares (net of fees and other costs)	10	**20,373,188**	26,156,425
		21,292,653	26,506,425
Net change in cash and cash equivalents		**(5,846,298)**	9,304,809
Impact of exchange rate changes on cash and cash equivalents		**(8,121)**	(1,112)
Cash and cash equivalents – beginning of year		**15,950,624**	6,646,927
Cash and cash equivalents – end of year		**10,096,205**	15,950,624

Supplemental cash flow information (Note 13)

See accompanying notes

DeepGreen Metals Inc.
Consolidated Statements of Changes in Shareholders' Equity
United States Dollars

	Share capital $	Preferred Shares $	Additional Paid in Capital $	Accumulated Other Comprehensive Loss $	Deficit $	Total $
December 31, 2018	40,350,123	550,000	29,538,112	(1,215,500)	(63,154,448)	6,068,287
Private placement	26,158,504	—	—	—	—	26,158,504
Financing cost	(2,079)	—	—	—	—	(2,079)
Common shares issued for services	14,270,606	—	(3,675,062)	—	—	10,595,544
Exercise of stock options	631,948	—	(281,948)	—	—	350,000
Common shares to be issued for exploration expenses	—	—	6,410,275	—	—	6,410,275
Common Share options-based payments	(1,584,657)	—	3,264,143	—	—	1,679,486
Currency translation differences	—	—	—	(34)	—	(34)
Loss for the year	—	—	—	—	(43,072,371)	(43,072,371)
December 31, 2019	79,824,445	550,000	35,255,520	(1,215,534)	(106,226,819)	8,187,612
Private placement	20,375,712	—	—	—	—	20,375,712
Common shares issued for TOML acquisition	27,999,997					27,999,997
Financing cost	(28,089)	—	—	—	—	(28,089)
Common shares issued for services	24,865,637	—	(6,410,275)	—	—	18,455,362
Exercise of stock options	1,790,157	—	(870,692)	—	—	919,465
Common shares to be issued for exploration expenses	—	—	12,879,057	—	—	12,879,057
Common Share options-based payments	(396,568)	—	4,493,086	—	—	4,096,518
Currency translation differences	—	—	—	(125)	—	(125)
Loss for the year	—	—	—	—	(56,631,379)	(56,631,379)
December 31, 2020	**154,431,291**	**550,000**	**45,346,696**	**(1,215,659)**	**(162,858,198)**	**36,254,130**

See accompanying notes

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
December 31, 2020
Expressed in US Dollars unless otherwise stated

1. Nature of Operations

DeepGreen Metals Inc. ("DeepGreen" or the "Company") is incorporated under the laws of the Province of British Columbia, Canada. The Company's corporate office, registered address and records office is located at 10th floor, 595 Howe Street, Vancouver, British Columbia, Canada, V6C 2T5.

DeepGreen is a Canadian company engaged in seafloor mineral exploration in the Clarion Clipperton Zone (the "Clarion Clipperton Zone"), approximately 2,000 km west of Mexico in the East Pacific Ocean, a region that hosts high grade polymetallic nodules containing manganese, nickel, copper and cobalt. DeepGreen is considered to have mining operations and mining properties in accordance with SEC regulations. The Company is also developing technology for onshore processing of polymetallic nodules as well as working with Allseas Group S.A ("Allseas") to develop a system to collect, lift and transport nodules to shore. DeepGreen's subsidiary, Nauru Ocean Resources Inc., ("NORI") was granted an exploration license by the International Seabed Authority ("ISA") in July 2011 and has exclusive rights to explore for polymetallic nodules covering 74,830 km^2 in the Clarion Clipperton Zone ("NORI Area"). The Company also has an agreement with Marawa Research and Exploration Ltd ("Marawa") with respect to polymetallic nodules in an exploration area of 74,990 km^2 in the Clarion Clipperton Zone granted to Marawa by the ISA where DeepGreen can purchase such tenements granted to Marawa or exclusively collect nodules from this area (the "Marawa Area") in return for a royalty payable to Marawa. During the year ended December 31, 2020, the Company acquired Tonga Offshore Mining Ltd. ("TOML") (Note 3). TOML was granted an exploration license by the ISA in January 2012 and has exclusive rights to explore for polymetallic nodules covering 74,713 km^2 of the Clarion Clipperton Zone.

The recovery of the Company's exploration licenses and attainment of profitable operations is dependent upon many factors including, among other things: financing being arranged by the Company to continue operations, explore and develop the ocean floor for the extraction of polymetallic nodules as well as develop processing technology for the treatment of polymetallic nodules, the establishment of a mineable resource, the commercial and technical feasibility of seafloor polymetallic nodule mining and processing, metal prices, and regulatory approval for mining and environmental permitting. The outcome of these matters cannot presently be determined because they are contingent on future events.

The Company will require additional funding in the future, for administration and to execute its exploration and development plans. While the Company has been successful in obtaining its required funding in the past, there is no assurance that such financing will continue to be available. Factors that could affect the availability of financing include, among other things, progress and exploration results, the state of international debt and equity markets, investor perceptions and expectations, and the global financial and metals markets.

Since March 2020, several measures have been implemented by the governments in Canada, the United States, Australia, and the rest of the world in the form of office closures and limiting the movement of personals in response to the increased impact from the novel coronavirus ("COVID-19"). While the impact of COVID-19 is expected to be temporary, the current circumstances are dynamic and the impact on our business operations cannot be reasonably estimated at this time. We anticipate this could have an adverse impact on our exploration plans, results of operations, financial position, and cash flows.

2. Basis of Presentation

Statement of Compliance

These consolidated financial statements have been prepared in accordance Generally Accepted Accounting Principles in the United States ("U.S. GAAP") and include the accounts of DeepGreen and its wholly owned subsidiaries.

The Board of Directors approved the consolidated financial statements on March 26, 2021.

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
December 31, 2020
Expressed in US Dollars unless otherwise stated

2. Basis of Presentation (cont.)

Basis of Measurement

These consolidated financial statements have been prepared under the historical cost convention and are presented in United States ("US") dollars.

Consolidation

These consolidated financial statements include the accounts of the Company (the "Parent") and its subsidiaries. The principal subsidiaries of the Company, their activities, and their geographic locations as at December 31, 2020 were as follows:

Subsidiary	Principal Activity	Location	Proportion of Interest Held by the Parent
DeepGreen Engineering Pte. Ltd. ("DGE")	Mineral exploration	Singapore	100%
DeepGreen Resources LLC ("DGL")	Holding Company	USA	100%
NORI	Mineral exploration	Republic of Nauru	100%
Nauru Education and Training Foundation Inc. ("NEAT")	Holding Company	Republic of Nauru	100%
Nauru Health and Environment Foundation Incorporated ("NHEF")	Holding Company	Republic of Nauru	100%
Tonga Offshore Mining Ltd. ("TOML")	Mineral exploration	Tonga	100%
Koloa Moana Resources Ltd. ("Koloa Moana")	Holding Company	Canada	100%
Offshore Minerals Pte. Ltd. ("Offshore Minerals")	Mineral exploration	Australia	100%
DeepGreen TOML Singapore Ltd. (TOML Singapore")	Mineral exploration	Singapore	100%
DeepGreen TOML Holding 1 ("TOML Hold 1")	Holding Company	British Virgin Islands	100%
DeepGreen TOML Holding 1 ("TOML Hold 2")	Holding Company	British Virgin Islands	100%
The Metals Company Nauru Holding LLC ("Nauru Holding")	Holding Company	USA	100%
The Metals Company LLC ("TMC")	Holding Company	USA	100%

The transactions among the entities in the consolidated group pertain to the transfer of funds and the payment of third-party costs. All inter-group balances have been eliminated upon consolidation.

Significant Accounting Policies

The Company's accounting policies specific to significant financial statement line items are included below. All accounting policies have been consistently applied to all years presented.

i. Foreign Currencies

The functional currency is the currency of the primary economic environment in which the entity operates. The functional currency of the Company and all its subsidiaries is the US Dollar, except for NEAT and NHEF, whose functional currency is the Australian Dollar.

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
December 31, 2020
Expressed in US Dollars unless otherwise stated

2. Basis of Presentation (cont.)

At the end of each reporting period, monetary assets and liabilities that are denominated in foreign currencies are translated into the functional currency at the rates prevailing at that date. Non-monetary assets and liabilities carried at fair value that are denominated in foreign currencies are translated at rates prevailing at the date when the fair value was determined. All gains and losses on translation of these foreign currency transactions are included in the statements of loss and comprehensive loss. Non-monetary items that are measured in terms of historical cost in a foreign currency are not retranslated.

For consolidation purposes, the assets and liabilities of entities with functional currencies other than the US dollar are translated at the period end rates of exchange, and the results of their operations are translated at average rates of exchange for the period. The resulting changes are recognized in accumulated other comprehensive loss within equity as currency translation differences.

ii. Loss Per Share

Basic loss per share is computed by dividing loss available to common shareholders by the weighted average number of common shares outstanding during the year. The computation of diluted loss per share assumes the conversion, exercise or contingent issuance of securities only when such conversion, exercise or issuance would have a dilutive effect on the loss per share. The dilutive effect of convertible securities is reflected in the diluted loss per share by application of the “if converted” method. The dilutive effect of outstanding options and their equivalents is reflected in the diluted loss per share by application of the treasury stock method.

iii. Financial Instruments

Financial assets and liabilities are recognized when the Company becomes a party to the contractual provisions of the instrument. Financial assets are derecognized when the rights to receive cash flows from the assets have expired, or have been transferred, and the Company has transferred substantially all risks and rewards of ownership. A financial liability is derecognized when the obligation specified in the contract is discharged, cancelled, or expires.

The Company’s financial instruments consists of cash and cash equivalents, accounts payable and accrued inabilities, and deferred acquisition costs all of which are recorded at amortized cost.

iv. Cash and Cash Equivalents

Cash and cash equivalents include cash on hand and term deposits with a remaining term to maturity at acquisition of three months or less.

v. Equipment

Equipment are stated at cost less accumulated depreciation and accumulated impairment losses. Cost includes expenditures that are directly attributable to the acquisition of the asset. Subsequent costs are included in the asset’s carrying amount or recognized as a separate asset, as appropriate, when it is probable that future economic benefits from such assets will flow to the Company and the cost of such assets can be measured reliably. The carrying amount of an asset is derecognized when it is replaced or taken out of service. Repairs and maintenance costs are charged to the statement of loss and comprehensive loss during the period they are incurred.

The major categories of equipment are amortized on declining balance basis as follows:

Exploration and other equipment	30%
Office equipment	30%

The Company allocates the amount initially recognized to each asset’s significant components and depreciates each component separately. Amortization methods and useful life of the assets are reviewed at each financial period end and adjusted on a prospective basis, if required.

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2. Basis of Presentation (cont.)

Gains and losses on disposals of equipment are determined by comparing the proceeds with the carrying amount of the asset and are included in the statement of loss and comprehensive loss.

vi. Leases

The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets and operating lease liabilities in the consolidated balance sheet. The Company does not have any finance leases.

ROU assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As most of such leases do not provide an implicit rate, the Company uses its incremental borrowing rate based on the estimated rate of interest for collateralized borrowing over a similar term of the lease payments at commencement date. The operating lease ROU asset also includes any lease payments made and excludes lease incentives. The lease terms may include options to extend or terminate the lease and when it is reasonably certain that we will exercise that option.

The Company elected to apply the short-term lease recognition exemption to all of its lease arrangements and recorded an expense of $116,760 (2019 – $85,479) for lease payments during the year ended December 31, 2020. Such lease expense is disclosed under office and sundry line item within the statement of loss and comprehensive loss and forms part of cash flow from operating activities.

vii. Exploration Licenses

The Company is in the exploration stage with respect to its investment in mineral licenses and follows the practice of capitalizing costs relating to the acquisition of such mineral licenses.

Exploration Expenses

The Company expenses all costs relating to exploration for and development of mineral claims. Such exploration and development costs include, but are not limited to, claims management, geological, geochemical and geophysical studies, process development. The mineral licenses would be charged to operations on a unit-of-production method based on proven and probable reserves should commercial production commence in the future.

viii. Stock-based compensation

Stock-based compensation is measured at the grant date based on the fair value of the award and is recognized over the requisite service period. Stock-based compensation costs are charged to exploration expenses or common share options-based payments in the income statement. The Company recognizes forfeiture of any awards as they occur. The Company records stock-based compensation from the issuance of the stock options with service-based conditions using the accelerated attribution method.

For stock options issued with performance conditions related to financing activities, the Company recognizes the costs when the specific performance targets are achieved using the accelerated attribution method. When these costs relate to equity financing, they are netted against share capital as a share issuance cost

The Company at times grants common shares or stock options in lieu of cash to certain vendors for their services to the Company. The Company recognizes the associated cost in the same period and manner as if the Company paid cash for the services provided.

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2. Basis of Presentation (cont.)

ix. Income Taxes

The Company accounts for income taxes under the asset and liability method which requires the recognition of deferred income tax assets and liabilities for the expected future tax consequences of temporary differences between the carrying amounts and tax bases of assets and liabilities. The Company provides a valuation allowance on deferred tax assets unless it is more likely than not that such assets will be realized.

Significant Accounting Estimates and Judgments

The preparation of financial statements in accordance with U.S. GAAP requires management to make judgments, estimates and assumptions that affect the application of policies and reported amounts of assets and liabilities, income and expenses. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis of making the judgments about carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

Significant management judgments and estimates were applied to the following areas:

i. TOML Acquisition

In March 2020, the Company completed the TOML Acquisition (Note 3) and applied guidance from U.S. GAAP Accounting Standard Coding (“ASC”) 805 to understand the accounting treatment regarding this acquisition and make necessary judgements.

ASC 805 defines a business as inputs and processes, when applied to the inputs, resulting in the creation of outputs. The key input acquired in connection with the TOML Acquisition is the TOML Exploration License and the related intellectual property. TOML Exploration License is in the development stage and therefore does not produce outputs. ASC 805 requires that where there is no output, there must be both an input and substantive process which must include an organized workforce with the necessary skills, experience, and knowledge to develop and convert the inputs into outputs, for a group of assets to be considered a business. An organized workforce was not included in the TOML Acquisition and therefore the Company’s management deemed that the TOML Acquisition was not a business acquisition and only an acquisition of a group of assets.

The Company’s position is supported by ASC 805’s guidance that if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not considered a business. The value of the TOML is considered to be primarily in the TOML Exploration License.

Management also determined that other assets acquired (which included other intangible assets such as patents and trademarks) were connected to the TOML Exploration License and would not hold value by themselves. The value of the total cost was therefore capitalized into one line item on the Company’s balance sheet, the Exploration licenses.

ii. Valuation of common share-based payments

DeepGreen recognizes the cost of share-based awards granted to employees, non-employees and directors based on the estimated grant-date fair value of the awards. DeepGreen determines the fair value of stock options using the Black-Scholes option pricing model, which is impacted by the following assumptions:

- Fair Value of Common Stock on the Date of the Grant — DeepGreen uses the price of the most recent private placements to assess the value of its shares on the date of the grant of incentive stock options.

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2. Basis of Presentation (cont.)

- Expected Term — DeepGreen uses the term of the award when calculating the expected term due to insufficient historical exercise data.
- Expected Volatility — As DeepGreen's shares are not actively traded, the volatility is based on a benchmark of comparable companies within the mining industry.
- Expected Dividend Yield — The dividend rate used is zero as DeepGreen has never paid any cash dividends on common stock and does not anticipate doing so during the expected life of the stock options.
- Risk-Free Interest Rate — The interest rates used are based on the implied yield available on Canadian Treasury zero-coupon issues with an equivalent remaining term equal to the expected life of the award.

Changes in these assumptions used to determine the fair value of the common share incentive stock options, including the vesting timeline of granted stock options, could have a material impact on the Company's loss and comprehensive loss.

DeepGreen determines the fair value of common shares issued for services based on the most recent private placements.

Recently Adopted Accounting Guidance

i. Leases

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which requires lessees to recognize all leases on the balance sheet, including operating leases, unless the lease is a short-term lease. ASU 2016-02 also requires additional disclosures regarding leasing arrangements. ASU 2016-02 became effective for the Company as of January 1, 2019. At January 1, 2019, the Company had an office lease agreement expiring September 12, 2020 which was later extended to September 12, 2022. The Company elected the short-term lease recognition exemption and, as a result, no right of use assets or lease liabilities were recognized as of January 1, 2019.

ii. Stock Based Compensation

In June 2018, the FASB issued ASU 2018-07, Stock Compensation (Topic 718), which updates the accounting provisions for nonemployee share-based payments to be measured at fair value as of the grant date. ASU 2018-07 became effective for the Company as of January 1, 2019.

Recent Accounting Guidance Not Yet Adopted

i. Accounting for Income Taxes

In December 2019, the FASB issued a new standard to simplify the accounting for income taxes. The guidance eliminates certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period, and the recognition of deferred tax liabilities for outside basis differences related to changes in ownership of equity method investments and foreign subsidiaries. The guidance also simplifies aspects of accounting for franchise taxes and enacted changes in tax laws or rates, and clarifies the accounting for transactions that result in a step-up in the tax basis of goodwill. The standard will be effective for the Company beginning Jan. 1, 2022, with early adoption permitted. The Company is currently evaluating the impact of this standard in the consolidated financial statements, including accounting policies, processes, and systems.

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3. TOML Acquisition

On March 31, 2020, the Company entered into an acquisition agreement ("TOML Acquisition") to acquire the nodules business unit from Deep Sea Mining Finance Ltd. ("Deep Sea Mining"). As part of this acquisition the Company acquired TOML, Koloa Moana, Offshore Minerals, TOML Singapore, TOML Hold 1 & TOML Hold 2 (together, the "TOML Group"), for a total purchase price, before transaction costs, of $32,000,000. TOML holds an ISA Exploration Contract in the Clarion Clipperton Zone of the East Pacific Ocean ("TOML Exploration Contract"). The TOML Acquisition includes the exclusive rights held by TOML to explore for polymetallic nodules in an area covering 74,713 km2, a priority right to apply for an exploitation contract to mine polymetallic nodules in the same area, and some exploration related equipment. The TOML group also holds various patents and an application right with respect to a prospecting exploration license in the Republic of Kiribati.

The purchase price of $32 million was settled through initial cash payments of $500,000 in two tranches of $250,000 each (paid), issuance of 7,777,777 common shares of the Company, $60,000 payment to ISA on behalf of Deep Sea Mining and deferred consideration of $3.44 million to be paid on January 31, 2021. As long as the deferred consideration remains outstanding, it is secured by the shares of the TOML Group. The Common Share consideration paid by the Company was valued at $3.60 per share based on the recent private placements completed by the Company, for a total of $28 million.

The Company had the option of settling the deferred consideration in either cash or Common Shares of the Company at its sole discretion. Subsequent to the year ended December 31, 2020, the arrangement with Deep Sea Mining was amended to pay the entire deferred consideration with cash in tranches by June 30, 2021 (Note 16).

The Company incurred legal and regulatory fees to complete the acquisition, totalling $47,375.

The Company determined that the value of TOML acquisition was substantially concentrated in the TOML Exploration Contract and therefore considered this to be an acquisition of a group of connected assets rather than an acquisition of business. As a consequence, the total cost of the transaction was primarily allocated to exploration licenses.

The net assets acquired as part of the TOML acquisition were as follows:

Net Assets acquired as at March 31, 2020	**$**
Cash payment	560,000
Common shares issued for TOML acquisition (7,777,777 @ $3.60)	27,999,997
Transaction costs paid	47,375
Deferred consideration	3,440,000
Total Acquisition Cost	**32,047,372**
Allocated to	
Equipment (Note 7)	21,274
Exploration licenses (Note 8)	42,701,464
Deferred tax liability (Note 15)[(1)]	(10,675,366)

(1) A deferred tax liability of $10,675,366 is recognized by the Company on acquisition during the year ended December 31, 2020 related to the difference between the book value and the tax basis of the TOML exploration license (Note 15).

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4. Financial Instruments

Categories of Financial Instruments

	December 31 2020 $	December 31 2019 $
Financial assets		
Amortized cost		
Cash and cash equivalents	**10,096,205**	15,950,624
	10,096,205	15,950,624
Financial liabilities		
Amortized cost		
Accounts payable and accrued liabilities	**4,315,477**	1,802,514
Deferred acquisition costs	**3,440,000**	—
	7,755,477	1,802,514

5. Cash and Cash Equivalents

Cash and cash equivalents include cash on hand and term deposits with a remaining term to maturity of three months or less as follows:

	December 31 2020 $	December 31 2019 $
Cash	**10,096,205**	1,450,624
Term deposits	**—**	14,500,000
	10,096,205	15,950,624

6. Receivables and Prepayments

	December 31 2020 $	December 31 2019 $
Taxes and other receivables	**55,832**	12,871
Prepayments	**72,940**	59,525
	128,772	72,396

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7. Equipment

The continuity schedule of equipment is as follows:

Cost	Exploration and other equipment $	Office equipment $	Total $
Balance, December 31, 2018	95,514	20,950	116,464
Additions	2,123,475	—	2,123,475
Balance, December 31, 2019	2,218,989	20,950	2,239,939
TOML Acquisition (Note 3)	21,274	—	21,274
Balance, December 31, 2020	**2,240,263**	**20,950**	**2,261,213**
Accumulated depreciation			
Balance, December 31, 2018	(33,951)	(14,961)	(48,912)
Amortization for the year	(336,990)	(2,451)	(339,441)
Balance, December 31, 2019	(370,941)	(17,412)	(388,353)
Amortization for the year	(562,122)	(1,061)	(563,183)
Balance, December 31, 2020	**(933,063)**	**(18,473)**	**(951,536)**
Net book value			
As at December 31, 2019	1,848,048	3,538	1,851,586
As at December 31, 2020	**1,307,200**	**2,477**	**1,309,677**

8. Exploration Licenses

Significant Exploration Agreements

NORI Exploration Contract:

The Company's wholly-owned subsidiary, NORI, was granted a polymetallic nodule exploration contract in the Clarion Clipperton Zone of the East Pacific Ocean by the ISA on July 22, 2011. The contract was acquired for $250,000, and provides NORI with exclusive rights to explore for polymetallic nodules in an area covering 74,830 km^2 for 15 years subject to complying with the exploration contract terms (Note 12) and provides NORI with the priority right to apply for an exploitation contract to mine polymetallic nodules in the same area.

NORI has a right to renounce, without penalty, the whole or part of its rights in the exploration area at any time and therefore doesn't have a fixed commitment with relation to the NORI License (Note 12)

Marawa Agreements:

On March 17, 2012 the Company's wholly-owned subsidiary, DGE, entered into an Option Agreement (the "Option Agreement") with Marawa and the Republic of Kiribati (the "State"). This Option Agreement has been amended on October 1, 2013. Under the amended Option Agreement, for an option fee of $250,000, DGE has the right to purchase tenements, as may be granted to Marawa by the ISA or any other regulatory body, for the greater of $300,000 or the value of any amounts owing to DGE by Marawa. This Option, can be exercised when a default event, as defined by the amendment agreement, occurs and anytime within 40 years after the date of execution of the Option agreement.

As at December 31, 2020, Marawa had no amounts owing to DGE under the Services Agreement and no purchase tenements had been granted to Marawa.

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8. Exploration Licenses (cont.)

On October 1, 2013, DGE entered into a services agreement (the "Services Agreement") with Marawa and the State, which grants the Company the exclusive right to carry out all exploration and mining in the Marawa Area. Under this agreement DGE will pay to the ISA on behalf of Marawa the following dues: $47,000 annual exploration fees, the ISA royalty and taxes and the ISA exploitation application fee of $250,000. Also, DGE will ensure that the activities carried out in the International Seabed Area by DGE and any other service contractor complies with the ISA regulations and any other required regulations under the Agreement. The Marawa Area is situated in close proximity to the 74,830 km^2 NORI Area.

The Services Agreement grants DGE the right to recover any and all polymetallic nodules from the Marawa Tenement Area by paying the Republic of Kiribati a royalty per wet tonne of polymetallic nodules (adjusted for inflation from October 1, 2013 onwards).

DGE has the right to terminate the Services Agreement at its sole discretion by giving written notice to Marawa and the State, and such termination shall take effect two months following the date of the termination notice, provided that DGE shall pay to the ISA on behalf of Marawa the fees or payments legally owed to the ISA by Marawa (including the annual ISA exploration fee and ISA royalties and taxes) that are outstanding at the date of termination or that are incurred within 12 months after the date of such termination. There are no other longer term commitments with respect to the Marawa Option and the Services Agreement.

TOML Exploration Contract:

The Company's wholly-owned subsidiary, TOML, was granted a polymetallic nodule exploration contract in the six areas of Clarion Clipperton Zone of the East Pacific Ocean by the ISA on Jan 11 2012. The TOML Group was acquired by the Company for $32 million from Deep Sea Mining (Note 3). TOML has the exclusive rights to explore for polymetallic nodules in an area covering 74,713 km^2 for 15 years and a priority right to apply for an exploitation contract to mine polymetallic nodules in the TOML area.

Strategic Partnerships

Marine Vessel Services:

Effective March 15, 2017, the Company entered into a strategic partnership with Maersk Supply Service A/S ("Maersk") to undertake the exploration, environmental base line and offshore testing required to support development of feasibility studies for economic production of polymetallic nodules from the Clarion Clipperton Zone. Under the agreement, Maersk provides marine vessel services and project management services, enabling DeepGreen to undertake the various marine cruises to support required prefeasibility studies. During these marine cruises DeepGreen undertook baseline studies required to complete an Environmental and Social Impact Assessment ("ESIA"), collected nodules for metallurgical test work and collected samples for resource evaluation. The costs related to marine vessel use is settled through DeepGreen Common Shares, the number of which is based on a contractual price of $1.25 per Common Share. Project management services provided by Maersk are paid in cash (Note 16).

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8. Exploration Licenses (cont.)

Common Shares transactions with Maersk since the inception of the strategic partnership with DeepGreen are as follows:

Year of Service	Invoiced amount $	Contractual Common Share Price $	# of Common Shares	Fair value of Common Shares $[1]	Cost Recognized $
2017/2018	2,565,500	1.25	2,052,400	0.75	1,539,300
2018	4,593,828	1.25	3,675,062	1.75	6,431,359
2019	5,615,480	1.25	4,492,384	3.60	16,172,582
2019/2020[2]	5,120,013	1.25	4,096,011	3.60	14,745,639
2020[2]	4,471,895	1.25	3,577,516	3.60	12,879,057
	22,366,716		**17,893,373**		**51,767,937**

(1) The fair value of the Company's Common Shares was determined based on the private placements completed around the time of Common Share issuances to Maersk.
(2) As at December 31, 2020, 3,577,516 (2019 – 1,780,632) Common Shares were yet to be issued by the Company for total value of $12,879,057 (2019 – $6,410,275) (Note 16).

As at December 31, 2020, Maersk owned 14,315,857 Common Shares of the Company which constituted 8.8% of the total Common Shares outstanding.

Total Maersk project management fees incurred during the year ended December 31, 2020 amounted to $4,407,478 (2019 – $2,820,625)., of which $1,829,268 remained outstanding as of December 31, 2020 (2019 – $437,159)

Pilot Mining Test Project

On March 29, 2019, DeepGreen and Allseas entered into a strategic alliance to conduct a Pilot Mining Test System ("PMTS"), the successful completion of which would aid DeepGreen's application for an exploitation contract with the ISA. Under the terms of this strategic alliance, Allseas subscribed for 6,666,668 Common Shares of DeepGreen for a total of $20,000,000 in cash (received during the year ended December 31,2019) and in consideration for a successful PMTS, DeepGreen committed to paying Allseas $30,000,000 in cash and further issuing 10,000,000 Common Shares (with a contractual price of $3.00 per share) for an additional $30,000,000 to Allseas. This additional payment is contingent upon successful delivery of the PMTS. Allseas will cover all the development cost of the project and will own all intellectual property used and generated in the development of the PMTS.

Upon successful completion of the PMTS, DeepGreen and Allseas have also agreed to enter into a nodule collection and shipping agreement whereby Allseas will provide production services for the production of the first 200 million metric tonnes of polymetallic nodules on a cost plus 50% profit basis.

DeepGreen and Allseas can terminate the strategic alliance without cause at any time subject to the following:

- DeepGreen will have a call option to buy Allseas' Common Shares in DeepGreen at the original contractual price.
- Allseas will have the right to collect 100 million metric tonnes (wet) of manganese nodule resources held by the Company by paying DeepGreen a royalty equivalent to 50% of the royalty charged by the ISA on the nodules collected.
- DeepGreen will have the right of first refusal to acquire and process all nodules collected using Allseas nodule collection and shipping systems.

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8. Exploration Licenses (cont.)

Upon termination without successful commissioning of the PMTS, Allseas will be compelled to either (at Allseas' sole election):

- Acquire an additional 10,000,000 Common Shares in DeepGreen for a consideration of $30,000,000; or
- Sell at least 6,666,667 Common Shares held in DeepGreen to the Company for total consideration of $1.

The fair value of the Company's Common Shares at the time of the initial subscription of $20,000,000 by Allseas was determined to be $1.75 per Common Share, based on the recent private placements completed by the Company at the time. As a result, the difference between the fair value and the total proceeds of $8,333,335 ($1.25 per Common Share) was considered to be an additional initial contribution by Allseas during the year ended December 31, 2019.

During 2020, the PMTS agreement was amended and DeepGreen paid an additional $10,000,000 in cash and issued 2,777,778 common shares valued at $3.60 per share for an additional $10,000,000 to allow for higher costs that had been incurred by Allseas. The expense related to the payment and issuance of shares was offset by the additional initial contribution by Allseas received in 2019.

During the year ended December 31, 2020, Allseas subscribed for an additional 2,777,778 Common Shares for cash proceeds of $10 million. As at December 31, 2020, Allseas owned 12,222,224 Common Shares of the Company which constituted 7.5% of total Common Shares outstanding.

As at December 31, 2020, DeepGreen's original commitment to pay Allseas $30,000,000 in cash and 10,000,000 common shares on completion of PMTS remained as the PMTS had not yet been successfully completed. The PMTS and strategic alliance agreements were further amended subsequent to the year end (Note 16).

Reconciliation — Exploration Licenses

A reconciliation of the Company's exploration licenses is as follows:

	NORI License $	**Marawa Option $**	**TOML License $**	**Total $**
Balance at December 31, 2018 and 2019	250,000	198,855	—	448,855
TOML Acquisition (*Note 3*)	—	—	42,701,464	42,701,464
Balance at December 31, 2020	**250,000**	**198,855**	**42,701,464**	**43,150,319**

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8. Exploration Licenses (cont.)

Exploration Expenses

The breakdown of exploration expenses incurred during 2020 and 2019 is as follows:

For the year ended December 31, 2020	General $	NORI License $	Marawa Option $	TOML $	Total $
Exploration expenses					
Exploration labour	—	1,557,966	721,940	500,828	2,780,734
Marine cruise	—	23,119,404	2,618,512	2,255,172	27,993,088
Pilot Mining Test	—	9,333,334	1,166,666	1,166,666	11,666,666
Common Share options-based payments *(Note 10)*	—	449,405	275,813	108,170	833,388
Amortization *(Note 7)*	—	555,740	—	6,382	562,122
External consulting	39,968	2,829,200	650,168	649,263	4,168,599
Travel, workshop and other	—	663,684	191,056	22,108	876,848
	39,968	**38,508,733**	**5,624,155**	**4,708,589**	**48,881,445**

For the year ended December 31, 2019	General $	NORI License $	Marawa Option $	Total $
Exploration expenses				
Exploration labour	—	1,635,858	895,165	2,531,023
Marine cruise	—	27,039,041	1,120,737	28,159,778
Common Share options-based payments *(Note 10)*	—	769,175	508,385	1,277,560
Amortization *(Note 7)*	—	336,990	—	336,990
External consulting	19,578	4,834,170	563,210	5,416,958
Travel, workshop and other	—	785,638	322,281	1,107,919
	19,578	**35,400,872**	**3,409,778**	**38,830,228**

9. Share Capital

Authorized and Issued

The Company has two classes of shares, being its Common Shares and Class B Preferred Shares. The authorized and issued share capital of the Company is as follows:

	Authorized	Issued and Outstanding
Common Shares	**Unlimited, with no par value**	**163,658,134**
Class B Preferred Shares	**Unlimited, with no par value**	**440,000**

Class B Preferred Shares are non-dividend earning and include voting rights similar to Common Shares. However, if any dividend is declared on Common Shares, the Company is required to concurrently declare and pay dividend on Class B Preferred Shares in the amount per share equal to the dividend per share paid on the Common shares. These Class B Preferred Shares rank ahead of Common Shares in the event of liquidation and are subject to automatic conversion to Common Shares on the basis of 1 Class B Preferred Share to 1 Common Share in the event of the Company closing a qualified Initial Public Offering of its Common Shares or if the Company undertakes a business combination, which results in the holders of the Common Shares of the Company holding securities of another entity.

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9. Share Capital (cont.)

The Class B Preferred Shares were issued in September 2016 at $1.25 per share. These shares had a condition that if, within 36 months after their issuance, the Company issued additional Common Shares for consideration in cash that was less than the issue price of the Class B Preferred Shares ("Subsequent Financing Securities"), each holder of a Class B Preferred Share had the right to acquire Common Shares at an issue price of $0.05 per share, for such number of Common Shares as would be required to lower the average acquisition cost of the holder's Class B Preferred Shares and such Common Shares to the purchase price of the Subsequent Financing Securities. The Class B Preferred Shareholders exercised this right and purchased 314,285 Common Shares of the Company for total proceeds of $15,714.

Continuity of Share Capital

Common Shares	**Number**	**Amount $**
Balance – December 31, 2018	122,210,059	40,350,123
Private placement	10,185,811	26,158,504
Financing cost incurred – Cash	—	(2,079)
Financing cost incurred – Stock options-based payments *(Note 10)*	—	(1,584,657)
Issued for services	8,167,446	14,270,606
Exercise of stock options	500,000	631,948
Balance – December 31, 2019	141,063,316	79,824,445
Private placement	5,659,920	20,375,712
Financing cost incurred – Cash	—	(28,089)
Financing cost incurred – Stock options-based payments *(Note 10)*	—	(396,568)
Issued for TOML acquisition	7,777,777	27,999,997
Issued for services	6,907,121	24,865,637
Exercise of stock options	2,250,000	1,790,157
Balance – December 31, 2020	**163,658,134**	**154,431,291**

Class B Preferred Shares	**Number**	**Amount $**
Balance – December 31, 2018, 2019 and 2020	**440,000**	**550,000**

Fiscal 2020 Activity — Shares

During the year ended December 31, 2020, the Company issued 5,659,920 Common shares in private placements for total proceeds of $20,375,712. Total cash financing cost incurred by the Company in conjunction with the financings amounted to $28,089.

The Company issued 2,777,778 and 4,096,010 Common Shares to Allseas and Maersk, respectively, for services (Note 8). The Company issued and additional 33,333 Common Shares for services to an arm's length party. Such Common Shares were valued at $3.60 per share based on the pricing of the recent private placements.

During the year ended December 31, 2020 option holders exercised 2,250,000 (2019 – 500,000) stock options for total proceeds of $919,465 (2019 – $350,000) at a weighted average exercise price of $0.41 (2019 – $0.70) per share.

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9. Share Capital (cont.)

Fiscal 2019 Activity — Shares

During the year ended December 31, 2019, the Company issued 3,519,143 Common shares in private placements at $1.75 per Common Share for total proceeds of $6,158,500. The Company also issued 6,666,668 common shares to Allseas pursuant to the strategic alliance agreement (Note 8) to additional proceeds of $20 million. Total cash financing cost incurred by the Company in conjunction with the financings amounted to $2,079.

The Company further issued 8,167,446 Common Shares for services to Maersk (Note 8) and 500,000 Common shares were issued upon exercise of incentive stock options at a price of $0.70 for total proceeds of $350,000.

10. Stock Options

Pursuant to the Company's stock option plan, directors may, from time to time, authorize the issuance of stock options to directors, officers, employees, and consultants of the Company and its subsidiaries. The board of directors grants such options with vesting periods and the exercise prices determined at its sole discretion. The Company's stock option plan provides that the aggregate number of Common Shares reserved for issuance under the plan shall not exceed 20% of the total number of issued and outstanding Common Shares of the Company on a non-diluted basis. As at December 31, 2020, there were 13,429,912 outstanding, leaving 19,301,715 stock options that are reserved for further issuance.

Continuity — Common Share Options

A continuity schedule of the Company's stock options is as follows:

	Options Outstanding	Weighted average exercise price $	Aggregate Intrinsic value of stock options	Weighted average contractual life (years)
Outstanding – December 31, 2018	19,138,748	0.71	5,741,624	8.16
Cancelled	(1,362,500)	0.75		
Forfeited	(350,000)	0.75		
Granted	50,000	0.75		
Exercised	(500,000)	0.70		
Outstanding – December 31, 2019	16,976,248	0.70	49,231,119	7.28
Cancelled	(862,500)	0.75		
Forfeited	(1,725,000)	0.75		
Expired	(100,000)	0.35		
Granted	1,391,164	2.31		
Exercised	(2,250,000)	0.41		
Outstanding – December 31, 2020	**13,429,912**	**0.90**	**36,126,463**	**7.34**
Vested and expected to Vest – December 31, 2020	**13,429,912**	**0.90**	**36,126,463**	**7.34**
Vested and exercisable – December 31, 2020	**12,575,162**	**0.84**	**34,833,199**	**7.33**

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
December 31, 2020
Expressed in US Dollars unless otherwise stated

10. Stock Options (cont.)

A summary of the Company's stock options outstanding as at December 31, 2020 is as follows:

Expiry Date	Exercise price	Weighted average life to expiry (years)	Options Outstanding	Options Exercisable
January 18, 2021	$ 0.35	0.05	100,000	100,000
March 31, 2024	$ 0.75	3.25	63,748	63,748
May 16, 2021	$ 0.75	0.37	50,000	50,000
June 1, 2028	$ 0.75	7.42	11,875,000	11,520,250
June 30, 2028	$ 3.00	7.50	1,000,000	500,000
June 30, 2028	$ Nil	7.50	100,000	100,000
December 31, 2025	$ 0.75	5.00	220,000	220,000
December 31, 2025	$ 0.25	5.00	21,164	21,164
			13,429,912	**12,575,162**

On July 23, 2018, the Company granted 5,300,000 common share options to employees, directors and consultants of the Company. The options had performance vesting conditions based on the Company reaching certain equity financing milestones. The Company estimated the realization of the vesting conditions as follows:

Vesting condition	Estimated date of completion	Exercise Price	Number of Options	Status as at December 31, 2020
Raise $10,000,000	March 1, 2019	$ 0.75	987,500	Forfeited
Complete Go Public transaction	June 1, 2019	$ 0.75	375,000	Forfeited
Raise $20,000,000	September 1, 2019	$ 0.75	1,481,500	Vested
Raise $30,000,000	March 1, 2020	$ 0.75	978,000	Vested
Raise $40,000,000	September 1, 2020	$ 0.75	862,500	Forfeited
Raise $40,000,000	December 31, 2020	$ 0.75	500,000	Vested
Raise $50,000,000	March 1, 2021	$ 0.75	115,500	Vested
			5,300,000	

As at December 31, 2020 based on the price of the most recent private placements, the fair value of the Company's common shares was $3.60 per share. A total of 13,429,912 incentive stock options were in the money with weighted average intrinsic value of $2.69 per share.

The aggregate intrinsic value of stock options exercised during the year ended December 31, 2020 and 2019 was $7,187,500 and $1,450,000, respectively. The total grant date fair value of options that vested during the year ended December 31, 2020 and 2019 was $4,585,796 and $3,216,076, respectively. As of December 31, 2020, total unrecognized stock-based compensation expense of $800,704 related to unvested stock options is expected to be recognized over a weighted-average recognition period of approximately 0.53 years.

Activity and Valuation — Common Share Options

On July 1, 2020, 1,000,000 incentive stock options were granted to certain non employees. These incentive stock options, exercisable at $3.00 per share, expire on June 30, 2028. A total of 500,000 options vested on the date of the grant and the remaining options vest on July 1, 2021.

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
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Expressed in US Dollars unless otherwise stated

10. Stock Options (cont.)

On July 7, 2020, 100,000 incentive stock options were granted to a consultant of the Company in return for the services provided by the consultant. These incentive stock options, exercisable at $Nil per share, expire on June 30, 2028 and vest immediately.

On December 23, 2020, 291,164 incentive stock options were granted to the consultants of the Company. Of these, a total of 270,000 incentive stock options are exercisable at $0.75 per share while 21,164 incentive stock options are exercisable at $0.25 per share. All options included in this grant vested immediately and expire on Dec 31, 2025.

The fair value of the options granted was estimated on the date of grant using the Black-Scholes option pricing model, with the following weighted average assumptions:

	2020	2019
Expected dividend yield	0.00%	0.00%
Expected stock price volatility	100.00%	100.00%
Risk-free interest rate	0.53%	1.59%
Expected life of options (years)	7.38	2.00
Estimated per share fair value of the Company's Common Shares	3.60	1.75

Changes in these assumptions could have a material impact on the Company's loss and comprehensive loss.

During the year ended December 31, 2020 the Company recognized $396,567 (2019 – $1,584,657) as part of financing costs within equity, for realizing the above-mentioned performance conditions. The Company also recognized additional $4,096,519 (2019 – $1,679,486) as common share option-based payments expense in the statement of loss and comprehensive loss. A total of $3,263,131 (2019 – $401,926) related to corporate matters and was charged to the statement of loss and comprehensive loss as common share options-based payments whereas $833,388 (2019 – $1,277,560), representing the allocation to exploration activities, was included within exploration expenses.

11. Related Party Transactions

The Company's subsidiary, DGE, is party to a consulting agreement with SSCS Pte. Ltd. ("SSCS") to manage offshore engineering studies. A director of DGE is employed through SSCS Pte. Ltd. Consulting services during the year ended December 31, 2020 amounted to $275,000 (2019 – $248,308) and are disclosed as external consulting and Exploration labour within exploration expenses (Note 9). As at December 31, 2020, the amount payable to SSCS amounted to $22,917 (2019 – $22,917).

The Company's Chief Ocean Scientist provides consulting services to the Company through Ocean Renaissance LLC ("Ocean Renaissance") where he is a principal. Consulting services during the year ended December 31, 2020 amounted to $366,667 (2019 – $354,999) and are disclosed as exploration labour within exploration expenses (Note 9). As at December 31, 2020, the amount payable to Ocean Renaissance amounted to $175 (2019 – $17,484).

12. Commitments

NORI Exploration Contract

As part of NORI's exploration contract with the ISA with respect to the NORI Area (Note 9), NORI committed to expending $5 million over the five-year period from 2017 to 2021. Such commitment has already been met. Such commitment is negotiated with the ISA and has flexibility where the amount can be reduced.

12. Commitments (cont.)

Marawa Exploration Contract

As part of Marawa's exploration contract with the ISA with respect to the Marawa Area (Note 9), Marawa commits to expending funds on exploration activities on an annual basis. The Commitment for fiscal 2020 was Australian dollar $1 million and for fiscal 2021 is Australian dollar $2 million. Such commitment is negotiated with the ISA on an annual basis.

TOML Exploration Contract

As part of TOML's exploration contract with the ISA with respect to the TOML Area (Note 8), TOML has committed to expending $30 million for a period from 2016 to 2021 in the first five-year review finalized in 2016. Such commitment has flexibility where the amount can be reduced by the ISA and such reduction would be dependent upon various factors including the success of the exploration programs and the availability of funding. As at December 31, 2020 the Company expended approximately $4.7 million. DeepGreen is due to discuss the progress since the acquisition of the TOML Group with the ISA later during 2021.

Offtake Agreements,

On May 25, 2012, the Company's wholly owned subsidiary, DGE, and Glencore International AG ("Glencore") entered into a copper offtake agreement and a nickel offtake agreement. DGE has agreed to deliver to Glencore 50% of the annual quantity of copper and nickel produced at a DGE owned processing facility from nodules derived from the NORI Area at LME referenced market pricing with allowances for product quality and delivery location. Both the copper and nickel offtake agreements are for the life of the Company's rights to the NORI Area. Either party may terminate the agreement upon a material breach or insolvency of the other party. Glencore may also terminate the agreement by giving twelve months' notice.

Sponsorship Agreements

On July 5, 2017, the Republic of Nauru ("Nauru"), the Nauru Seabed Minerals Authority and NORI entered into a sponsorship agreement (the "NORI Sponsorship Agreement") formalising certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI Area. Upon reaching a minimum level of nodule production from the tenement area, NORI will pay Nauru a seabed mineral recovery payment based on the wet tonnes of polymetallic nodules recovered from the tenement area. In addition, NORI will pay an administration fee each year to Nauru for such administration and sponsorship, which is subject to review and increase in the event that NORI is granted an ISA exploitation contract.

On March 8, 2008, the Kingdom of Tonga ("Tonga") and TOML entered into a sponsorship agreement (the "TOML Sponsorship Agreement") formalising certain obligations of the parties in relation to TOML's exploration and potential exploitation of the TOML Area. Upon reaching a minimum recovery level of nodule production from the tenement area, TOML has agreed to pay Tonga a seabed mineral recovery payment based on the wet tonnes of polymetallic nodules recovered from the tenement area. In addition, TOML has agreed to pay the reasonable direct costs incurred by Tonga to administer the ISA obligations of Tonga to the ISA.

DeepGreen Metals Inc.
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13. Supplemental Cash Flow Information

Non-Cash Investing and Financing Activities	For the year ended December 31 2020 $	For the year ended December 31 2019 $
Common Shares issued for previous services (Note 8)	**6,410,275**	6,431,359
Common Shares issued for exploration license acquisition (Note 3)	**27,999,997**	—
Settlement of additional contribution from Allseas (Note 8)	**8,333,335**	—
Financing stock options issued (Note 10)	**396,567**	1,584,657

14. Segmented Information

The Company's business consists of only one operating segment, namely exploration of seafloor polymetallic nodules, which includes the development of a metallurgical process to treat such seafloor polymetallic nodules. Details on a geographical basis of the Company's long-lived assets are as follows:

Equipment	December 31 2020 $	December 31 2019 $
Republic of Nauru	**1,292,308**	1,848,048
Tonga	**14,892**	—
North America	**2,477**	3,538
Total	**1,309,677**	1,851,586

15. Income Taxes

Reconciliation of Effective Tax Rate

The Company is subject to Canadian federal and provincial tax for the estimated assessable profit for the years ended December 31, 2019 and 2020 at a rate of 27.00%. The Company had no assessable profit in Canada for all periods disclosed.

The tax expense at statutory rates for the Company can be reconciled to the reported loss for the year per the statement of loss and comprehensive loss as follows:

	For the year ended December 31 2020 $	For the year ended December 31 2019 $
Net loss for the year	**(56,631,379)**	(43,072,371)
Canadian Federal and Provincial income tax rates	**27.00%**	27.00%
Income tax recovery based on the above rates	**(15,290,472)**	(11,629,540)
Permanent differences	**980,690**	386,507
Effect of differences in future and foreign tax rates	**11,151,898**	10,042,909
Foreign exchange and other	**(141,758)**	(275,813)
Valuation allowance changes affecting the provision of income taxes	**3,299,642**	1,475,937
Total income taxes	**—**	—

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15. Income Taxes (cont.)

The Company follows a comprehensive model for recognizing, measuring, presenting, and disclosing uncertain tax positions taken or expected to be taken on a tax return. Tax positions must initially be recognized in the financial statements when it is more likely than not the position will be sustained upon examination by the tax authorities. Such tax positions must initially and subsequently be measured as the largest amount of tax benefit that has a greater than 50% likelihood of being realized upon ultimate settlement with the tax authority assuming full knowledge of the position and relevant facts.

The Company currently has no uncertain tax positions and is therefore not reflecting any adjustments for such in its deferred tax asset.

The Company's policy is to account for income tax related interest and penalties in income tax expense in the accompanying statements of operations. There have been no income tax related interest or penalties assessed or recorded.

The Company's deferred income taxes are as follows:

	December 31 2020 $	December 31 2019 $
Deferred Tax Assets		
Non-capital losses	**10,925,043**	5,156,568
Capital losses and other	**70,162**	68,777
Equipment	**5,102**	4,701
Share issuance costs	**74,506**	128,931
Total deferred income tax assets	**11,074,813**	5,358,977
Valuation allowance	**(11,074,813)**	(5,358,977)
Deferred tax asset recognized	**—**	—
Deferred tax liability recognized	**(10,675,366)**	—

ASC 740 requires that the tax benefit of net operating losses, temporary differences and credit carry forwards be recorded as an asset to the extent that management assesses that realization is "more likely than not." Realization of the future tax benefits is dependent on the Company's ability to generate sufficient taxable income within the carry forward period. Because of the Company's history of operating losses, management believes that recognition of the deferred tax assets arising from the above-mentioned future tax benefits is currently not likely to be realized and, accordingly, has provided a valuation allowance.

The deferred tax liability is recognized due to the difference between the book value and the tax basis of the acquired assets, as part of the TOML Acquisition (Note 3).

Deductible temporary differences, unused tax losses and unused tax credits:

	December 31 2020 $	December 31 2019 $	Expiry Date Range
Non-capital losses	**45,312,941**	21,081,632	See below
Capital losses	**519,720**	509,463	Not applicable
Equipment	**18,895**	17,412	Not applicable
Share issuance costs	**275,949**	477,522	2021 to 2024

DeepGreen Metals Inc.
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15. Income Taxes (cont.)

As at December 31, 2020, the Company had non-capital loss carry-forwards of $45,312,941 that may be used to offset future taxable income. These losses, if not utilized, will expire as follows:

	Canada	United States	Singapore	Tonga
2031	445,778	—	—	—
2032	478,464	—	—	—
2033	325,440	—	—	—
2034	812,056	—	—	—
2035	1,814,112	2,340	—	—
2036	1,601,988	232	—	—
2037	2,615,282	208	—	—
2038	4,800,633	—	—	—
2039	3,497,333	—	—	—
2040	4,312,741	—	—	—
No expiry	—	—	10,214,470	14,391,864
	20,703,827	**2,780**	**10,214,470**	**14,391,864**

As at December 31, 2019, the non-capital loss carry-forwards of $21,081,632 pertained to the following:

	Canada	United States	Singapore	Tonga
Loss carry-forwards	**15,725,792**	**2,780**	**5,353,060**	**—**

The Company files income tax returns in Canada, Singapore and the Kingdom of Tonga, and is subject to examination in these jurisdictions for all years since the Company's inception in 2011. Fiscal years outside the normal statute of limitation remain open to audit by tax authorities due to tax attributes generated in those early years which have been carried forward and may be audited in subsequent years when utilized. The timing of the resolution, settlement and closure of any income tax audits is highly uncertain, and the Company is unable to estimate the full range of possible adjustments to the balance of gross unrecognized tax benefits. It is possible that the balance of gross unrecognized tax benefits could significantly change in the next 12 months. As at December 31, 2020, the 2020 tax year filings for the Company and its subsidiaries (where applicable) remain unfiled and have not been assessed by the relative tax Authorities.

16. Subsequent Events

In preparing the consolidated financial statements for the year ended December 31, 2020, the Company has evaluated subsequent events for recognition and disclosure through March 26, 2021, the date that these consolidated financial statements and accompanying notes were available for issuance.

1. On January 27, 2021, the Company signed a Letter of Intent ("LOI") with Sustainable Opportunities Acquisition Corporation ("SOAC"), a NYSE listed Special Purpose Acquisition Corporation ("SPAC"), for a proposed business combination ("Business Combination") in which SOAC would merge with DeepGreen pursuant to a proposed combination and relisting on NASDAQ. The new entity will be renamed The Metals Company in connection with the merger.

   The Parties to the LOI have granted mutual exclusivity of 30 days to complete transaction due diligence and commence marketing to potential PIPE investors in connection with the transaction. SOAC currently holds approximately $300 million in treasury and the parties expect to raise an additional $330 million in PIPE funds. The proposed structure contemplates that on completion, DeepGreen shareholders would hold approximately 77% of The Metals Company, PIPE Investors approximately11% and SOAC investors approximately 10% and SOAC Sponsors approximately 2%. Certain DeepGreen Shareholders would be subject to a customary lock up arrangement for a period of up to 12 months or once certain trading conditions of The Metals Company have been met.

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
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16. Subsequent Events (cont.)

In addition to the share-based consideration in SOAC, each DeepGreen shareholder would receive incentive shares (the "Incentive Shares"). These Incentive Shares would vest and be issued to each DeepGreen Shareholder when The Metals Company's share price trades above certain thresholds as follows:

Share price ($)	15	25	35	50	75	100	150	200
Incentive Shares (mil)	5	10	10	20	20	20	25	25

Similarly, in connection with the transaction, the SOAC sponsors will also be entitled to additional 0.5 million Incentive Shares when the share price of The Metals Company trades at $50.00.

In connection with the proposal, SOAC, a Cayman entity, proposes to redomicile to Canada. Accordingly, DeepGreen would amalgamate and remain a Canadian entity, being listed in the United States on the NASDAQ.

The Company and SOAC finalized the Business Combination agreement on March 4, 2021. The parties are currently evaluating the accounting impact of the transaction.

2. The Company made a payment of $1,250,000 on January 26, 2021, and $440,000 on February 26, 2021 to Deep Sea in connection with the deferred consideration related to TOML Acquisition (Note 3). The Company has committed to making the remaining payment of $1,750,000 by June 30, 2021.

3. On January 29, 2021, 1,800,000 incentive stock options, with exercise price of $0.75 per share, were exercised by the Company's directors and officers for total proceeds of $1,350,000.

4. On February 17, 2021, the Company granted a total of 490,666 incentive stock options to certain directors and non-employees. These options have an exercise price of between $0.25 per share and $0.75 per share, vested immediately upon grant, and expire between February 17, 2026 and February 26, 2026.

5. On February 26, 2021, the Company granted a total of 40,400 incentive stock options to a consultant. These options have an exercise price between $0.25 per share, vested immediately upon grant, and expire on February 26, 2026.

6. During February 2021, the Company raised a total of $26 million through convertible debentures financing. The convertible debentures bear interest at the rate of 7.0% per annum, compounded annually, with maturity date that is 24 months from the date of the financing. The debentures can be converted into shares of the Company at anytime at the conversion price of $10 per share. Unless any interest is converted prior to the maturity date, all accrued and unpaid interest shall be payable at the maturity date in common shares of the Company at a conversion price of $10 per share.

   In the event that the Company completes a SPAC transaction or a change of control transaction at any time prior to the maturity date, the debenture value will be automatically converted into the common shares at the conversion price immediately prior to the SPAC or change of control transaction. If the debentures, or any portion thereof, is not converted by the holder upon the earlier of the maturity date or the completion of the SPAC of change of control transaction, the outstanding debenture value will automatically convert into the common shares of the Company at the conversion price of $10 per share.

   On February 18, 2021, debentures totalling $500,000 were converted to 50,000 common shares of the Company.

7. On March 1, 2021, the Company issued 3,666,267 Common Shares to Maersk to settle the invoiced amount of $4,582,834 with respect to the use of the marine vessel. Of the total invoice amount, $4,471,595 pertained to the marine cruises undertaken during the year ended December 31, 2020.

DeepGreen Metals Inc.
Notes to Consolidated Financial Statements
December 31, 2020
Expressed in US Dollars unless otherwise stated

16. Subsequent Events (cont.)

On March 4, 2021, the agreement with Maersk was amended whereby all future costs pertaining to the use of the marine vessel would be paid in cash rather than through issuance of the Common Shares of the Company. The amended agreement is in place until early 2022, at which point the parties will finalize the potential offshore engagement beyond 2022.

8. On March 4, 2021, the Company granted 4,973,237 incentive stock options to certain employees, directors and consultants under the Company's short-term incentive payment plan (the "STIP"), as well as 8,450,000 incentive stock options to the same individuals under its long-term incentive plan (the "LTIP").

   The stock options granted under the STIP expire on June 1, 2028, have and exercise prices ranging between $0.75 per share and $3.60 per share, and have vesting periods to a maximum of three years.

   The stock options granted under the LTIP have an exercise price of $0.75 per share and expire on June 1, 2028. These options vest based on performance conditions as follows: 25% when the Company's market capitalization equals $3 billion, 35% when the Company's market capitalization equals $6 billion, 20% upon the date the ISA grants an exploitation contract to the Company, and 20% upon the commencement of commercial production following the grant of the exploitation contract.

9. On March 4, 2021, DeepGreen entered into an amended agreement with Allseas (the "Amendment # 3") whereby, upon successful completion of the Business Combination, instead of issuing 10 million Common Shares to Allseas in connection with the PMTS, DeepGreen issued to Allseas a warrant to acquire 10 million DeepGreen Common Shares at a nominal value (the "Allseas Warrant"). The Allseas Warrant will vest and become exercisable upon successful completion of the PMTS and will expire on September 30, 2026. There are vesting conditions associated with the Allseas Warrant whereby a maximum of 10 million DeepGreen Common Shares would be issued if the PMTS is completed by September 30, 2023, gradually decreasing to 5 million DeepGreen Common Shares if PMTS is completed after September 30, 2025.

   The Allseas Warrant will be assumed by SOAC at the closing of the Business Combination to become a warrant to purchase The Metals Company ("TMC") common shares, adjusted for the exchange ratio for the transaction. If the market price of the TMC common shares on June 1, 2022 is higher than $15 per share (as adjusted based on the exchange ratio for the closing of the Business Combination), the aggregate value of the shares underlying the warrant above $150 million as at June 1, 2022 will automatically become a commercial credit from Allseas to TMC equal to the excess value. This commercial credit will be effective on the vesting date of the Allseas Warrant and the Company will be able to exchange this excess value for any future goods and services from Allseas under the nodule collection and shipping contract for one year after commercial production.

   The cash payment of $30 million in the original agreement was also amended to be paid as follows, provided that the Business Combination is completed:

   - $10 million on June 30, 2021 with Allseas providing confirmation of placing an order of certain equipment and demonstrating certain progress on construction of the collector vehicle;
   - $10 million on the later of (i) January 1, 2022, and (ii) confirmation of successful collection of the North Sea test; and
   - $10 million upon successful completion of the PMTS.

   The Amendment # 3 is not effective until the successful completion of the Business Combination. If the Business Combination is not consummated, the Allseas Warrant shall be cancelled and the rights and obligations set forth in Amendment # 3 shall not take effect and the rights and obligations under the arrangements with Allseas as in effect prior to the execution of Amendment # 3 shall continue in effect unless otherwise amended.

DEEPGREEN METALS INC.

CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

March 31, 2021

(UNAUDITED)

DeepGreen Metals Inc.
Condensed Consolidated Balance Sheets
(Unaudited)
US Dollars

	Note	As at March 31 2021 $	As at December 31 2020 $
ASSETS			
Current			
Cash and cash equivalents		**25,224,404**	10,096,205
Receivables and prepayments		**120,697**	128,772
		25,345,101	10,224,977
Non-current			
Exploration licenses	4	**43,150,319**	43,150,319
Equipment		**1,211,451**	1,309,677
		44,361,770	44,459,996
TOTAL ASSETS		**69,706,871**	54,684,973
LIABILITIES			
Current			
Accounts payable and accrued liabilities	4,8	**6,429,351**	4,315,477
Deferred acquisition costs	3	**1,250,000**	3,440,000
		7,679,351	7,755,477
Non-current			
Convertible debentures	5	**25,720,452**	—
Deferred tax liability	3	**10,675,366**	10,675,366
		44,075,169	18,430,843
EQUITY			
Common shares *(unlimited shares, no par value – issued: 169,230,402 (December 31, 2020 – 163,658,134)*	6	**183,137,353**	154,431,291
Preferred shares *(unlimited share, no par value – issued: 440,000 (December 31, 2020 – 440,000)*	6	**550,000**	550,000
Additional Paid in Capital		**63,576,426**	45,346,696
Accumulated other comprehensive loss		**(1,215,660)**	(1,215,659)
Deficit		**(220,416,417)**	(162,858,198)
		25,631,702	36,254,130
TOTAL LIABILITIES AND EQUITY		**69,706,871**	54,684,973

Nature of Operations *(Note 1)*
Commitments *(Note 9)*
Subsequent Events *(Note 12)*

"Gerard Barron", Director

"Paul Matysek", Director

See accompanying notes

DeepGreen Metals Inc.
Condensed Consolidated Statements of Loss and Comprehensive Loss
(Unaudited)
US Dollars (except weighted average number of shares outstanding)

	Note	For the three months ended March 31 2021 $	For the three months ended March 31 2020 $
Operating expenses			
Exploration expenses	4	**39,364,151**	12,181,916
Consulting fees		**638,776**	173,199
Investor relations		**1,129,646**	177,697
Office and sundry		**96,260**	64,336
Professional fees		**2,821,888**	67,088
Salaries and wages		**277,499**	225,677
Director fees		**48,784**	47,285
Common Share options-based payments	7	**12,878,985**	16,880
Transfer agent and filing fees		**3,764**	3,878
Travel		**59,408**	98,777
		57,319,161	13,056,733
Other items			
Foreign exchange loss (gain)		**18,606**	(34,979)
Interest expense (income)		**220,452**	(41,417)
Loss for the period		**57,558,219**	12,980,337
Other comprehensive income to be reclassified to profit and loss in subsequent periods			
Currency translation loss (gain)		**1**	(157)
Comprehensive loss for the period		**57,558,220**	12,980,180
Loss per share – Basic and diluted		**0.35**	0.09
Weighted average number of common shares outstanding		**166,149,715**	141,193,613

See accompanying notes

DeepGreen Metals Inc.
Condensed Consolidated Statements of Cash Flows
(Unaudited)
US Dollars

	Note	For the three months ended March 31 2021 $	For the three months ended March 31 2020 $
Cash resources provided by (used in)			
Operating activities			
Loss for the period		**(57,558,219)**	(12,980,337)
Items not affecting cash:			
Amortization		**98,226**	139,200
Expenses settled in share-based payments	4,7	**45,058,520**	8,452,421
Unrealized foreign exchange		**(965)**	2,187
Changes in non-cash working capital			
Receivables and prepayments		**8,075**	(43,204)
Accounts payable and accrued liabilities		**2,113,874**	1,459,763
Interest on convertible debentures and investments	5	**220,452**	41,417
		(10,060,037)	(2,928,553)
Investing activities			
Acquisition of exploration license	3	**(2,190,000)**	(250,000)
		(2,190,000)	(250,000)
Financing activities			
Exercise of stock options	7	**1,377,272**	—
Proceeds from issuance of convertible debentures	5	**26,000,000**	—
Proceeds from issuance of common shares (net of fees and other costs)	6	**—**	1,166,818
		27,377,272	1,166,818
Net change in cash and cash equivalents		**15,127,235**	(2,011,735)
Impact of exchange rate changes on cash and cash equivalents		**964**	(2,029)
Cash and cash equivalents – beginning of period		**10,096,205**	15,950,624
Cash and cash equivalents – end of period		**25,224,404**	13,936,860

Supplemental cash flow information (Note 10)

See accompanying notes

DeepGreen Metals Inc.
Condensed Consolidated Statements of Changes in Shareholders' Equity
(Unaudited)
United States Dollars

	Share Capital $	Preferred Shares $	Additional Paid in Capital $	Accumulated Other Comprehensive Loss $	Deficit $	Total $
December 31, 2020	154,431,291	550,000	45,346,696	(1,215,659)	(162,858,198)	36,254,130
Exercise of incentive stock options	2,542,193	—	(1,172,421)	—	—	1,369,772
Common shares issued for exploration expenses	25,663,869	—	(12,879,057)	—	—	12,784,812
Conversion of debentures	500,000	—	—	—	—	500,000
Common Share options-based payments	—	—	32,273,708	—	—	32,273,708
Common shares to be issued for options exercise	—	—	7,500	—	—	7,500
Currency translation differences	—	—	—	(1)	—	(1)
Loss for the period	—	—	—	—	(57,558,219)	(57,558,219)
March 31, 2021	**183,137,353**	**550,000**	**63,576,426**	**(1,215,660)**	**(220,416,417)**	**25,631,702**
December 31, 2019	79,824,445	550,000	35,255,520	(1,215,534)	(106,226,819)	8,187,612
Private placement	667,512	—	—	—	—	667,512
Financing cost	(26,260)	—	—	—	—	(26,260)
Common shares issued for TOML Acquisition	27,999,997	—	—	—	—	27,999,997
Common shares to be issued for exploration expenses	—	—	8,835,363	—	—	8,835,363
Common Share options-based payments	—	—	117,058	—	—	117,058
Currency translation differences	—	—	—	157	—	157
Loss for the period	—	—	—	—	(12,980,337)	(12,980,337)
March 31, 2020	**108,465,694**	**550,000**	**44,207,941**	**(1,215,377)**	**(119,207,156)**	**32,801,102**

See accompanying notes

DeepGreen Metals Inc.
Notes to Condensed Consolidated Financial Statements
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1. Nature of Operations

DeepGreen Metals Inc. ("DeepGreen" or the "Company") is incorporated under the laws of the Province of British Columbia, Canada. The Company's corporate office, registered address and records office is located at 10th floor, 595 Howe Street, Vancouver, British Columbia, Canada, V6C 2T5.

DeepGreen is a Canadian company engaged in seafloor mineral exploration in the Clarion Clipperton Zone (the "Clarion Clipperton Zone"), approximately 2,000 km west of Mexico in the East Pacific Ocean, a region that hosts high grade polymetallic nodules containing manganese, nickel, copper and cobalt. DeepGreen is considered to have mining operations and mining properties in accordance with SEC regulations. The Company is also developing technology for onshore processing of polymetallic nodules as well as working with Allseas Group S.A ("Allseas") to develop a system to collect, lift and transport nodules to shore. DeepGreen's subsidiary, Nauru Ocean Resources Inc., ("NORI") was granted an exploration license by the International Seabed Authority ("ISA") in July 2011 and has exclusive rights to explore for polymetallic nodules covering 74,830 km^2 in the Clarion Clipperton Zone ("NORI Area"). The Company also has an agreement with Marawa Research and Exploration Ltd ("Marawa") with respect to polymetallic nodules in an exploration area of 74,990 km^2 in the Clarion Clipperton Zone granted to Marawa by the ISA where DeepGreen can purchase such tenements granted to Marawa or exclusively collect nodules from this area (the "Marawa Area") in return for a royalty payable to Marawa. During the year ended December 31, 2020, the Company acquired Tonga Offshore Mining Ltd. ("TOML") (Note 3). TOML was granted an exploration license by the ISA in January 2012 and has exclusive rights to explore for polymetallic nodules covering 74,713 km^2 of the Clarion Clipperton Zone.

On March 4, 2021, the Company and Sustainable Opportunities Acquisition Corporation ("SOAC"), a NYSE listed Special Purpose Acquisition Corporation ("SPAC"), entered into a business combination agreement (the "BCA") in which SOAC would merge with DeepGreen pursuant to a proposed combination and relist on the NASDAQ (the "Business Combination"). The new entity will be renamed TMC the metals company Inc. ("TMC") in connection with the Business Combination.

SOAC holds approximately $300 million in treasury and the parties raised an additional $330 million in Private Investment in Public Equity ("PIPE") funds at $10 per share. The proposed structure contemplates that on completion, DeepGreen shareholders would hold approximately 77% of TMC, PIPE Investors approximately11% and SOAC investors approximately 10% and SOAC Sponsors approximately 2%. Certain DeepGreen Shareholders would be subject to a customary lock up arrangement for a period of up to 12 months or once certain trading conditions of TMC have been met.

In addition to the share-based consideration in SOAC, each DeepGreen shareholder would receive incentive shares (the "Incentive Shares"). These Incentive Shares would vest and be issued to each DeepGreen Shareholder when TMC's share price trades above certain thresholds as follows:

Share price ($)	15	25	35	50	75	100	150	200
Incentive Shares (mil)	5	10	10	20	20	20	25	25

Similarly, in connection with the transaction, the SOAC sponsors will also be entitled to additional 0.5 million Incentive Shares when the share price of TMC trades at $50.00.

In connection with the Business Combination, SOAC, a Cayman entity, would redomicile to Canada. Accordingly, DeepGreen would amalgamate and remain a Canadian entity, being listed in the United States on the NASDAQ.

The Business Combination is subject to the approval of SOAC's and DeepGreen's shareholders and other customary closing conditions, including the registration statement being declared effective by the US Securities and Exchange Commission (the "SEC"). A registration statement on form S-4 was filed with the SEC on April 8, 2021.

DeepGreen Metals Inc.
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1. Nature of Operations (cont.)

The recovery of the Company's exploration licenses and attainment of profitable operations is dependent upon many factors including, among other things: financing being arranged by the Company to continue operations, explore and develop the ocean floor for the extraction of polymetallic nodules as well as develop processing technology for the treatment of polymetallic nodules, the establishment of a mineable resource, the commercial and technical feasibility of seafloor polymetallic nodule mining and processing, metal prices, and regulatory approval for mining and environmental permitting. The outcome of these matters cannot presently be determined because they are contingent on future events.

Despite the expected completion of the Business Combination, the Company will require additional funding in the future for administration and to execute its exploration and development plans. While the Company has been successful in obtaining its required funding in the past, there is no assurance that such financing will continue to be available. Factors that could affect the availability of financing include, among other things, progress and exploration results, the state of international debt and equity markets, investor perceptions and expectations, and the global financial and metals markets.

Since March 2020, several measures have been implemented by the governments in Canada, the United States, Australia, and the rest of the world in the form of office closures and limiting the movement of personnel in response to the increased impact from the novel coronavirus ("COVID-19"). While the impact of COVID-19 is expected to be temporary, the current circumstances are dynamic and the impact on our business operations, exploration and development plans, results of operations, financial position, and cash flows cannot be reasonably estimated at this time.

2. Summary of Significant Accounting Policies

Basis of Presentation

These unaudited condensed consolidated financial statements are prepared in accordance with US Generally Accepted Accounting Principles ("US GAAP") for interim financial statements. Accordingly, certain information and footnote disclosures required by US GAAP have been condensed or omitted in these unaudited consolidated financial statements pursuant to such rules and regulation. In management's opinion, these unaudited consolidated interim financial statements include all adjustments of a normal recurring nature necessary for the fair presentation of the Company's statement of financial position, operating results for the periods presented, comprehensive loss, stockholder's equity and cash flows for the interim periods, but are not necessarily indicative of the results of operations to be expected for the full year ending December 31, 2021 or for any other period. These unaudited condensed consolidated financial statements should be read in conjunction with the audited annual consolidated financial statements for the year ended December 31, 2020. The Company has applied the same accounting policies as in the prior year.

Basis of Measurement

These unaudited condensed consolidated financial statements have been prepared under the historical cost convention and are presented in United States ("US") dollars.

Use of Estimates

The preparation of financial statements in conformity with US GAAP requires management to make estimates and assumptions that affect the reported amounts in the unaudited consolidated financial statements and the notes thereto. Significant estimates and assumptions reflected in these unaudited consolidated financial statements include, but are not limited to, the valuation of common-share based payments, including valuation of the incentive stock options (Note 7) and the common shares issued to Maersk Supply Service A/S ("Maersk") (Note 4 & 6). Actual results could differ materially from those estimates.

DeepGreen Metals Inc.
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2. Summary of Significant Accounting Policies (cont.)

Recent Accounting Pronouncements Issued and Adopted

i. Accounting for Debt with Conversion and Other Options

In August 2020, the Financial Accounting Standards Board (the "FASB") issued Accounting Standards Update ("ASU" 2020-08, *"Debt — Debt with Conversion and Other Options (Subtopic 470-20) and Derivative and Hedging — Contracts in Entity's Own Equity (Subtopic 815-40)"*, which simplifies the accounting for convertible instruments by reducing the number of accounting models and requiring that a convertible instrument be accounted for as a single liability measured at amortized cost. Further the ASU 2020-08 amends the earnings per share guidance by requiring the diluted earnings per share calculation for convertible instruments to follow the if-converted method, with the use of the treasury stock method no longer permitted. The ASU 2020-08 is effective for fiscal period after December 15, 2021, with early adoption permitted, but no earlier than fiscal years and interim periods within those fiscal years, beginning after December 15, 2020. The ASU 2020-08 allows either a modified retrospective method of transition or a fully retrospective method of transition, with any adjustments recognized as an adjustment to the opening balance of deficit. The Company adopted this standard on January 1, 2021. The standard did not have any impact on the Company's historical financial statements but was applied to recognize the impact of the convertible debentures issued during February 2021. (Note 5).

3. TOML Acquisition

On March 31, 2020, the Company entered into an acquisition agreement ("TOML Acquisition") to acquire the nodules business unit of Tong Offshore Mining Ltd ("TOML") and other entities in the group (the "TOML Group"), from Deep Sea Mining Finance Ltd. ("Deep Sea Mining"). Total purchase price of the TOML Acquisition, before transaction costs, was $32,000,000. TOML holds an ISA Exploration Contract in the Clarion Clipperton Zone of the East Pacific Ocean ("TOML Exploration Contract"). The TOML Acquisition includes the exclusive rights held by TOML to explore for polymetallic nodules in an area covering 74,713 km^2, a priority right to apply for an exploitation contract to mine polymetallic nodules in the same area, and some exploration related equipment. The TOML group also holds various patents and an application right with respect to a prospecting exploration license in the Republic of Kiribati.

The purchase price of $32,000,000 was settled through initial cash payments of $500,000 in two tranches of $250,000 each (paid on March 31, 2020 and May 31, 2020, respectively), issuance of 7,777,777 common shares of the Company, $60,000 payment to ISA on behalf of Deep Sea Mining and deferred consideration of $3.44 million to be paid on January 31, 2021. As long as the deferred consideration remains outstanding, it is secured by the shares of the TOML Group. The Common Share consideration paid by the Company was valued at $3.60 per share based on the recent private placements completed by the Company, for a total of $28 million.

The Company had the option of settling the deferred consideration in either cash or Common Shares of the Company at its sole discretion. During January 2021, the arrangement with Deep Sea Mining was amended to pay the entire deferred consideration with cash in tranches by June 30, 2021.

The Company incurred legal and regulatory fees to complete the acquisition, totalling $47,375.

The Company determined that the value of TOML Acquisition was substantially concentrated in the TOML Exploration Contract and therefore considered this to be an acquisition of a group of connected assets rather than an acquisition of business. As a consequence, the total cost of the transaction was primarily allocated to exploration licenses.

DeepGreen Metals Inc.
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3. TOML Acquisition (cont.)

The net assets acquired as part of the TOML acquisition were as follows:

Net Assets acquired	**$**
Cash payment	560,000
Common shares issued for TOML acquisition (7,777,777 @ $3.60)	27,999,997
Transaction costs paid	47,375
Deferred consideration	3,440,000
Total Acquisition Cost	**32,047,372**
Allocated to	
Equipment	21,274
Exploration licenses (Note 4)	42,701,464
Deferred tax liability[(1)]	(10,675,366)

(1) A deferred tax liability of $10,675,366 was recognized by the Company on acquisition during the year ended December 31, 2020 related to the difference between the book value and the tax basis of the TOML exploration license.

The Company made payments to Deep Sea Mining as follow in connection with the deferred consideration: $1,250,000 on January 26, 2021, $440,000 on February 26, 2021, $500,000 on March 31, 2021, and $500,000 on April 30, 2021. The Company has committed to making the remaining payment of $750,000 by June 30, 2021.

4. Exploration Licenses

Significant Exploration Agreements

NORI Exploration Contract:

The Company's wholly-owned subsidiary, NORI, was granted a polymetallic nodule exploration contract in the Clarion Clipperton Zone of the East Pacific Ocean by the ISA on July 22, 2011. The contract was acquired for $250,000, and provides NORI with exclusive rights to explore for polymetallic nodules in an area covering 74,830 km^2 for 15 years subject to complying with the exploration contract terms (Note 9) and provides NORI with the priority right to apply for an exploitation contract to mine polymetallic nodules in the same area.

NORI has a right to renounce, without penalty, the whole or part of its rights in the exploration area at any time and therefore doesn't have a fixed commitment with relation to the NORI License (Note 9)

Marawa Agreements:

On March 17, 2012 the Company's wholly-owned subsidiary, DeepGreen Engineering Pte. Ltd. ("DGE"), entered into an Option Agreement (the "Marawa Option Agreement") with Marawa and the Republic of Kiribati (the "State"). This Marawa Option Agreement was amended on October 1, 2013. Under the amended Marawa Option Agreement, for an option fee of $250,000, DGE has the right to purchase tenements, as may be granted to Marawa by the ISA or any other regulatory body, for the greater of $300,000 or the value of any amounts owing to DGE by Marawa. This Marawa Option, can be exercised when a default event, as defined by the amendment agreement, occurs and anytime within 40 years after the date of execution of the Marawa Option agreement.

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4. Exploration Licenses (cont.)

As at March 31, 2021, Marawa had no amounts owing to DGE under the Marawa Services Agreement (defined below) and no purchase tenements had been granted to Marawa.

On October 1, 2013, DGE entered into a services agreement (the "Marawa Services Agreement") with Marawa and the State, which grants the Company the exclusive right to carry out all exploration and mining in the Marawa Area. Under this agreement DGE will pay to the ISA on behalf of Marawa the following dues: $47,000 annual exploration fees, the ISA royalty and taxes and the ISA exploitation application fee of $250,000. Also, DGE will ensure that the activities carried out in the Marawa Area by DGE and any other service contractor complies with the ISA regulations and any other required regulations. The Marawa Area is situated in close proximity to the 74,830 km^2 NORI Area.

The Marawa Services Agreement grants DGE the right to recover any and all polymetallic nodules from the Marawa Area by paying the Republic of Kiribati a royalty per wet tonne of polymetallic nodules (adjusted for inflation from October 1, 2013 onwards).

DGE has the right to terminate the Marawa Services Agreement at its sole discretion by giving written notice to Marawa and the State, and such termination shall take effect two months following the date of the termination notice, provided that DGE shall pay to the ISA on behalf of Marawa the fees or payments legally owed to the ISA by Marawa (including the annual ISA exploration fee and ISA royalties and taxes) that are outstanding at the date of termination or that are incurred within 12 months after the date of such termination. There are no other longer term commitments with respect to the Marawa Option and the Marawa Services Agreement.

TOML Exploration Contract:

The Company's wholly-owned subsidiary, TOML, was granted a polymetallic nodule exploration contract in the six areas of Clarion Clipperton Zone of the East Pacific Ocean by the ISA on Jan 11 2012. The TOML Group was acquired by the Company for $32 million from Deep Sea Mining (Note 3). TOML has the exclusive rights to explore for polymetallic nodules in an area covering 74,713 km^2 for 15 years and a priority right to apply for an exploitation contract to mine polymetallic nodules in the TOML area.

Strategic Partnerships

Marine Vessel Services:

Effective March 15, 2017, the Company entered into a strategic partnership with Maersk to undertake the exploration, environmental base line and offshore testing required to support development of feasibility studies for economic production of polymetallic nodules from the Clarion Clipperton Zone. Under the agreement, Maersk provides marine vessel services and project management services, enabling DeepGreen to undertake the various marine cruises to support required prefeasibility studies. During these marine cruises DeepGreen undertook baseline studies required to complete an Environmental and Social Impact Assessment ("ESIA"), collected nodules for metallurgical test work and collected samples for resource evaluation. Up until February 5, 2021, the costs related to the marine vessel use was settled through DeepGreen Common Shares, the number of which was based on a contractual price of $1.25 per Common Share. Project management services provided by Maersk are paid in cash.

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4. Exploration Licenses (cont.)

Common Shares transactions with Maersk since the inception of the strategic partnership with DeepGreen are as follows:

Year of Service	Invoiced amount $	Contractual Common Share Price $	# of Common Shares	Fair value of Common Shares $[1]	Cost Recognized $
2017/2018	2,565,500	1.25	2,052,400	0.75	1,539,300
2018	4,593,828	1.25	3,675,062	1.75	6,431,359
2019	5,615,480	1.25	4,492,384	3.60	16,172,582
2019/2020	5,120,013	1.25	4,096,011	3.60	14,745,639
2020/2021[2]	4,582,834	1.25	3,666,267	7.00	25,663,869
	22,477,655		**17,982,124**		**64,552,749**

(1) The fair value of the Company's Common Shares was determined based on the private placements completed around the time of Common Share issuances to Maersk, including the application of weighted average probability for the closing of the Business Combination.
(2) During the three months ended March 31, 2021, the Company issued 3,666,267 Common Shares to Maersk of which, 3,577,516 pertained to the marine vessel use during the year ended December 31, 2020. These Common Shares were recognized at their estimated fair value of $7.00 (December 31, 2020 – $3.60 per Common Share).

As at March 31, 2021, Maersk owned 17,982,124 Common Shares of the Company which constituted 10.63% of the total Common Shares outstanding. Maersk is considered a related party to the Company.

Total cost incurred to Maersk for marine campaigns during the three months ended March 31, 2021 and 2020 amounted to $16,206,338 and $10,186,981, respectively.

On March 4, 2021, the agreement with Maersk was amended whereby all costs incurred from February 5, 2021 pertaining to the use of the marine vessel would be paid in cash rather than through issuance of the Common Shares of the Company. The amended agreement is in place until early 2022, at which point the parties will finalize the potential offshore engagement beyond 2022. During the period from February 5, 2021 to March 31, 2021, the Company incurred a total of $3,421,525 to Maersk for marine campaign related costs.

As at March 31, 2021, amount payable to Maersk was $2,920,329 (December 31, 2020 – $1,829,268).

Pilot Mining Test Project

On March 29, 2019, DeepGreen and Allseas entered into a strategic alliance to conduct a Pilot Mining Test System ("PMTS"), the successful completion of which would aid DeepGreen's application for an exploitation contract with the ISA. Under the terms of this strategic alliance, Allseas subscribed for 6,666,668 Common Shares of DeepGreen for a total of $20,000,000 in cash (received during the year ended December 31, 2019) and in consideration for a successful PMTS, DeepGreen committed to paying Allseas $30,000,000 in cash and further issuing 10,000,000 Common Shares (with a contractual price of $3.00 per share) for an additional anticipated cost of $30,000,000 to Allseas. This additional payment is contingent upon successful delivery of the PMTS. Allseas will cover all the development cost of the project and will own all intellectual property used and generated in the development of the PMTS.

Upon successful completion of the PMTS, DeepGreen and Allseas have also agreed to enter into a nodule collection and shipping agreement whereby Allseas will provide production services for the production of the first 200 million metric tonnes of polymetallic nodules on a cost plus 50% profit basis.

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4. Exploration Licenses (cont.)

DeepGreen and Allseas can terminate the strategic alliance without cause at any time subject to the following:

- DeepGreen will have a call option to buy Allseas' Common Shares in DeepGreen at the original contractual price.
- Allseas will have the right to collect 100 million metric tonnes (wet) of manganese nodule resources held by the Company by paying DeepGreen a royalty equivalent to 50% of the royalty charged by the ISA on the nodules collected.
- DeepGreen will have the right of first refusal to acquire and process all nodules collected using Allseas nodule collection and shipping systems.

Upon termination without successful commissioning of the PMTS, Allseas will be compelled to either (at Allseas' sole election):

- Acquire an additional 10,000,000 Common Shares in DeepGreen for a consideration of $30,000,000; or
- Sell at least 6,666,667 Common Shares held in DeepGreen to the Company for total consideration of $1.

The fair value of the Company's Common Shares at the time of the initial subscription of $20,000,000 by Allseas was determined to be $1.75 per Common Share, based on the recent private placements completed by the Company at the time. As a result, the difference between the fair value and the total proceeds of $8,333,335 (i.e. $1.25 per Common Share) was considered to be an additional initial contribution by Allseas during the year ended December 31, 2019.

During 2020, the PMTS agreement was amended and DeepGreen paid an additional $10,000,000 in cash and issued 2,777,778 common shares valued at $3.60 per share for an additional $10,000,000 to allow for higher costs that had been incurred by Allseas. The expense related to the payment and issuance of shares was offset by the additional initial contribution by Allseas received in 2019.

During the year ended December 31, 2020, Allseas subscribed for an additional 2,777,778 Common Shares for cash proceeds of $10 million.

On March 4, 2021, DeepGreen entered into an amended agreement with Allseas (the "Amendment # 3") whereby, upon successful completion of the Business Combination (Note 1), instead of issuing 10 million Common Shares to Allseas in connection with the PMTS, DeepGreen issued to Allseas a warrant to acquire 10 million DeepGreen Common Shares at a nominal value (the "Allseas Warrant"). The Allseas Warrant will vest and become exercisable upon successful completion of the PMTS and will expire on September 30, 2026. There are vesting conditions associated with the Allseas Warrant whereby a maximum of 10 million DeepGreen Common Shares would be issued if the PMTS is completed by September 30, 2023, gradually decreasing to 5 million DeepGreen Common Shares if PMTS is completed after September 30, 2025.

The Allseas Warrant will be assumed by SOAC at the closing of the Business Combination (Note 1) to become a warrant to purchase TMC common shares, adjusted for the exchange ratio for the transaction. If the market price of the TMC common shares on June 1, 2022 is higher than $15 per share (as adjusted based on the exchange ratio for the closing of the Business Combination), the aggregate value of the shares underlying the warrant above $150 million as at June 1, 2022 will automatically become a commercial credit from Allseas to TMC equal to the excess value. This commercial credit will be effective on the vesting date of the Allseas Warrant and the Company will be able to exchange this excess value for any future goods and services from Allseas under the nodule collection and shipping contract for one year after commercial production.

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4. Exploration Licenses (cont.)

The cash payment of $30 million in the original agreements was also amended to be paid as follows, provided that the Business Combination is completed:

- $10 million on June 30, 2021 with Allseas providing confirmation of placing an order of certain equipment and demonstrating certain progress on construction of the collector vehicle;
- $10 million on the later of (i) January 1, 2022, and (ii) confirmation of successful collection of the North Sea test; and
- $10 million upon successful completion of the PMTS.

The Amendment # 3 is not effective until the successful completion of the Business Combination as discussed in Note 1 and as such, the impact of the amendment is not recognized within these condensed unaudited consolidated financial statements. If the Business Combination is not consummated, the Allseas Warrant shall be cancelled and the rights and obligations set forth in Amendment # 3 shall not take effect and the rights and obligations under the arrangements with Allseas as in effect prior to the execution of Amendment # 3 shall continue in effect unless otherwise amended.

As at March 31, 2021, Allseas owned 12,222,224 Common Shares of the Company which constituted 7.22% of total Common Shares outstanding.

Exploration Expenses

The breakdown of exploration expenses incurred is as follows:

For the period ended March 31, 2021	General $	NORI License $	Marawa Option $	TOML $	Total $
Exploration expenses					
Exploration labour	—	435,767	188,434	166,189	790,390
Marine cruise	—	13,329,423	1,666,177	1,666,177	16,661,777
Pilot Mining Test	—	—	—	—	—
Common Share options-based payments *(Note 7)*	—	10,733,007	4,392,998	4,268,718	19,394,723
Amortization	—	96,923	—	1,117	98,040
External consulting	511	1,537,866	259,327	289,640	2,087,344
Travel, workshop and other	—	150,401	79,084	102,392	331,877
	511	**26,283,387**	**6,586,020**	**6,494,233**	**39,364,151**

For the period ended March 31, 2020	General $	NORI License $	Marawa Option $	Total $
Exploration expenses				
Exploration labour	—	416,091	230,705	646,796
Marine cruise	—	8,093,819	2,105,646	10,199,465
Common Share options-based payments *(Note 7)*	—	58,267	41,911	100,178
Amortization	—	138,935	—	138,935
External consulting	11,514	347,367	134,294	493,175
Travel, workshop and other	—	431,404	171,963	603,367
	11,514	**9,485,883**	**2,684,519**	**12,181,916**

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5. Convertible Debentures

During February 2021, the Company raised a total of $26 million through a convertible debentures financing. The convertible debentures bear interest at the rate of 7.0% per annum, compounded annually, with a maturity date that is 24 months from the date of the financing. The debentures can be converted into shares of the Company at anytime at the conversion price of $10 per share. Unless any interest is converted prior to the maturity date, all accrued and unpaid interest shall be payable at the maturity date in DeepGreen Common Shares at a conversion price of $10 per share.

In the event that the Company completes the Business Combination (Note 1) or another change of control transaction at any time prior to the maturity date, the debenture value will be automatically converted into the common shares at the conversion price immediately prior to the Business Combination or the change of control transaction. If the debentures, or any portion thereof, are not converted by the holder upon the earlier of the maturity date or the completion of the Business Combination or the change of control transaction, the outstanding debenture value will automatically convert into the common shares of the Company at the conversion price of $10 per share.

On February 18, 2021, convertible debentures with a principal amount of $500,000 were converted into 50,000 Common Shares of the Company.

During the three months ended March 31, 2021, the Company accrued $220,452 of interest on convertible debentures.

As at March 31, 2021, the Company has reserved 2,572,045 Common Shares to be issued upon conversion of the outstanding debentures, consisting of $25,500,000 and $220,452 of principal and accrued interest, respectively.

6. Share Capital

Authorized and Issued

The Company has two classes of shares, being its Common Shares and Class B Preferred Shares. The authorized and issued share capital of the Company is as follows:

	Authorized	Issued and Outstanding
Common Shares	**Unlimited, with no par value**	**169,230,401**
Class B Preferred Shares	**Unlimited, with no par value**	**440,000**

Class B Preferred Shares are non-dividend earning and include voting rights similar to Common Shares. However, if any dividend is declared on Common Shares, the Company is required to concurrently declare and pay dividend on Class B Preferred Shares in the amount per share equal to the dividend per share paid on the Common shares. These Class B Preferred Shares rank ahead of Common Shares in the event of liquidation and are subject to automatic conversion to Common Shares on the basis of 1 Class B Preferred Share to 1 Common Share upon completion of the Business Combination (Note 1) or any other change in control transaction.

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6. Share Capital (cont.)

Continuity of Share Capital

Common Shares	Number	Amount $
Balance – December 31, 2019	141,063,316	79,824,445
Private placement	5,659,920	20,375,712
Financing cost incurred – Cash	—	(28,089)
Financing cost incurred – Stock options-based payments	—	(396,568)
Issued for TOML acquisition (*Note 3*)	7,777,777	27,999,997
Issued for services	6,907,121	24,865,637
Exercise of stock options	2,250,000	1,790,157
Balance – December 31, 2020	163,658,134	154,431,291
Issued for services *(Note 4)*	3,666,267	25,663,869
Exercise of stock options	1,856,000	2,542,193
Conversion of debentures	50,000	500,000
Balance – March 31, 2021	**169,230,401**	**183,137,353**

Class B Preferred Shares	Number	Amount $
Balance – December 31, 2020 and March 31, 2021	**440,000**	**550,000**

Fiscal 2021 Activity

The Company issued 3,666,267 Common Shares to Maersk for services valued at $7.00 per share (Note 4). The Company estimated the fair value of common stock based on observable transactions in the Company's common stock and by applying a probability-weighted approach to various outcomes. The approach involves estimates, judgments and assumptions that are highly complex and subjective. Changes in any or all of these estimates and assumptions, or the relationships between these assumptions, impact the Company's valuation of its common stock as of each valuation date which may have a material impact on the valuation of the Company's common stock and equity awards for accounting purposes.

During the period ended March 31, 2021 option holders exercised 1,856,000 stock options for total proceeds of $1,369,772 at a weighted average exercise price of $0.74 per share.

On February 18, 2021, convertible debentures with a principal amount of $500,000 were converted into 50,000 common shares of the Company.

7. Stock Options

Pursuant to the Company's stock option plan, directors may, from time to time, authorize the issuance of stock options to directors, officers, employees, and consultants of the Company and its subsidiaries. The board of directors grants such options with vesting periods and the exercise prices determined at its sole discretion. The Company's stock option plan provides that the aggregate number of Common Shares reserved for issuance under the plan shall not exceed 20% of the total number of issued and outstanding Common Shares of the Company on a non-diluted basis. As at March 31, 2021, there were 16,984,214 stock options outstanding under the Company's Short-Term Incentive Plan ("STIP") and 8,450,000 stock options outstanding under the Company's Long-term Incentive Plan ("LTIP"), leaving 8,411,866 stock options that are reserved for further issuance.

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7. Stock Options (cont.)

Continuity

A continuity schedule of the Company's stock options in the Company's STIP is as follows:

	Options Outstanding	Weighted average exercise price $	Aggregate Intrinsic value of stock options	Weighted average contractual life (years)
Outstanding – December 31, 2020	13,429,912	0.90	36,126,463	7.34
Granted	5,504,302	2.44		
Expired	(44,000)	0.45		
Cancelled/Forfeited	(50,000)	0.75		
Exercised	(1,856,000)	0.74		
Outstanding – March 31, 2021	**16,984,214**	**1.42**	**96,794,659**	**7.04**
Vested and expected to Vest – March 31, 2021	**16,984,214**	**1.42**	**96,794,659**	**7.04**
Vested and exercisable – March 31, 2021	**14,529,464**	**0.88**	**88,909,967**	**7.02**

A summary of the Company's stock options outstanding, granted under DeepGreen's STIP as at March 31, 2021 is as follows:

Expiry Date		Exercise price	Weighted average life to expiry (years)	Options Outstanding	Options Exercisable
March 31, 2024	$	0.75	3.00	63,748	63,748
December 31, 2025	$	0.75	4.76	220,000	220,000
December 31, 2025	$	0.25	4.76	21,164	21,164
February 2, 2026	$	0.75	4.85	50,000	50,000
February 17, 2026	$	0.60	4.89	133,000	133,000
February 17, 2026	$	0.25	4.89	307,666	307,666
February 26, 2026	$	0.25	4.91	40,400	40,400
June 1, 2028	$	0.75	7.18	15,048,236	13,093,486
June 30, 2028	$	3.00	7.25	1,000,000	500,000
June 30, 2028	$	Nil	7.25	100,000	100,000
				16,984,214	**14,529,464**

During the three months ended March 31, 2021, the Company also granted 8,450,000 under it's LTIP. Such stock options have an exercise price of $0.75 per Common Share and expire on June 1, 2028. The aggregate intrinsic value of such LTIP stock options as at March 31, 2021 was $52,812,500. None of the LTIP stock options were exercisable on March 31, 2021. The Company expects such options to vest as and when the market and performance milestones described below are achieved. As at March 31, 2021, total unrecognized stock-based compensation expense for the LTIP stock options was $50,212,671.

As at March 31, 2021 the fair value of the Company's Common Shares was $7.00 per share. The Company estimated the fair value of common stock based on observable transactions in the Company's common stock and by applying a probability-weighted approach to various outcomes. The approach involves estimates, judgments and

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7. Stock Options (cont.)

assumptions that are highly complex and subjective. Changes in any or all of these estimates and assumptions, or the relationships between these assumptions, impact the Company's valuation of its common stock as of each valuation date which may have a material impact on the valuation of the Company's common stock and equity awards for accounting purposes.

The aggregate intrinsic value of stock options exercised during the period ended March 31, 2021 was $11,618,560.

The total grant date fair value of STIP stock options that vested during the period ended March 31, 2021 was $24,611,641. As of March 31, 2021, total unrecognized stock-based compensation expense of $5,120,693 is expected to be recognized over a weighted-average recognition period of approximately 1.47 years.

Activity and Valuation

On February 17, 2021, the Company granted a total of 490,666 incentive stock options to certain directors and non-employees. These options have an exercise price of between $0.25 per share and $0.75 per share, vested immediately upon grant, and expire between February 17, 2026 and February 26, 2026.

On February 26, 2021, the Company granted a total of 40,400 incentive stock options to a consultant. These options have an exercise price between $0.25 per share, vested immediately upon grant, and expire on February 26, 2026.

On March 4, 2021, the Company granted 4,973,237 incentive stock options to certain employees, directors and consultants under the Company's STIP, as well as 8,450,000 incentive stock options to the same individuals under its LTIP.

The stock options granted under the STIP expire on June 1, 2028, have and exercise prices ranging between $0.75 per share and $10 per share, and have vesting periods to a maximum of three years.

The stock options granted under the LTIP have an exercise price of $0.75 per share and expire on June 1, 2028. The LTIP awards vest as follows:

(1) 25% when the Company's market capitalization equals $3 billion ("Tranche 1");

(2) 35% when the Company's market capitalization equals $6 billion ("Tranche 2");

(3) 20% upon the date that the ISA grants an exploitation contract to the Company ("Tranche 3"); and

(4) 20% upon the commencement of the first commercial production following the grant of the exploitation contract ("Tranche 4").

As the vesting of Tranche 1 and Tranche 2 is based on the Company's market capitalization of $3 billion and $6 billion, respectively, these options are determined to be market-based awards ("Market Based Awards") for which the Company has calculated fair value and derived a service period through which to expense the related fair value. The options included in Tranche 1 and Tranche 2 had a day one fair value of $6.47 per share and $6.28 per share and derived service periods of 0.33 years and 1.41 years, respectively. The Company will expense these awards rateably over the remaining service period.

Tranche 3 and Tranche 4 of the LTIP stock options vest based on the ISA contract and the commencement of commercial production. These options are determined to be performance-based awards ("Performance Based Awards"). The Company will recognize compensation costs for the Performance Based Awards if and when the Company concludes that it is probable that the performance conditions will be achieved. As of March 31, 2021, no

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7. Stock Options (cont.)

compensation expense related to the Performance Based Awards was recorded as the awarding of an ISA contract is outside the control of the Company. The Company will reassess the probability of the vesting of the Performance Based Awards at each reporting period and adjust the compensation cost when determined to be probable.

The fair value of the options granted under the Company's STIP was estimated on the date of grant using the Black-Scholes option pricing model, with the following weighted average assumptions:

	2021
Expected dividend yield	0.00%
Expected stock price volatility	89.44%
Risk-free interest rate	0.51%
Expected life of options (years)	3.73
Estimated per share fair value of the Company's Common Shares	7.00

The fair value of the Market Based Awards granted under the LTIP was estimated on the date of grant using a Monte Carlo model to simulate a distribution of future stock prices with the following weighted average assumptions:

	Tranche 1 and Tranche 2
Expected dividend yield	0.00%
Expected stock price volatility	90.98%
Risk-free interest rate	1.25%
Expected life of options (years)	7.25
Estimated per share fair value of the Company's Common Shares	7.00

The fair value of the Performance Based Awards granted under the LTIP was estimated on the date of grant using the Black-Scholes option pricing model with the following weighted average assumptions:

	Tranche 3	Tranche 4
Expected dividend yield	0.00%	0.00%
Expected stock price volatility	91.23%	91.23%
Risk-free interest rate	0.82%	0.85%
Expected term (years)	5.22	5.35
Estimated per share fair value of the Company's Common Shares	7.00	7.00

Changes in these assumptions could have a material impact on the Company's loss and comprehensive loss.

During the three months ended March 31, 2021 and 2020, the Company recognized $32,273,708 and $117,058 respectively, as common share option-based payments expense in the statement of loss and comprehensive loss. A total of $12,878,985 (March 31, 2020 – $16,880) related to corporate matters and was charged to the statement of loss and comprehensive loss as common share options-based payments whereas $19,394,723 (March 31, 2020 – $100,178), representing the allocation to exploration activities, was included within exploration expenses.

8. Related Party Transactions

The Company's subsidiary, DGE, is party to a consulting agreement with SSCS Pte. Ltd. ("SSCS") to manage offshore engineering studies. A director of DGE is employed through SSCS Pte. Ltd. Consulting services during the period ended March 31, 2021 amounted to $74,479 (2020 – $68,750) and are disclosed as external consulting and Exploration labour within exploration expenses (Note 4). As at March 31, 2021, the amount payable to SSCS amounted to $22,917 (December 31, 2020 – $22,917).

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8. Related Party Transactions (cont.)

The Company's Chief Ocean Scientist provides consulting services to the Company through Ocean Renaissance LLC ("Ocean Renaissance") where he is a principal. Consulting services during the period ended March 31, 2021 amounted to $92,509 (2020 – $92,500) and are disclosed as exploration labour within exploration expenses (Note 4). As at March 31, 2021, the amount payable to Ocean Renaissance amounted to $nil (December 31, 2020 – $175).

9. Commitments

NORI Exploration Contract

As part of NORI's exploration contract with the ISA with respect to the NORI Area (Note 4), NORI committed to expending $5 million over the five-year period from 2017 to 2021. Such commitment has already been met. Such commitment is negotiated with the ISA and has flexibility where the amount can be reduced.

Marawa Exploration Contract

As part of Marawa's exploration contract with the ISA with respect to the Marawa Area (Note 4), Marawa commits to expending funds on exploration activities on an annual basis. The Commitment for fiscal 2021 is Australian dollar $2 million. Such commitment is negotiated with the ISA on an annual basis.

TOML Exploration Contract

As part of TOML's exploration contract with the ISA with respect to the TOML Area (Note 4), TOML has committed to expending $30 million for a period from 2016 to 2021 in the first five-year review finalized in 2016. Such commitment has flexibility where the amount can be reduced by the ISA and such reduction would be dependent upon various factors including the success of the exploration programs and the availability of funding. As at March 31, 2021 the Company expended approximately $11.2 million. DeepGreen is due to discuss the progress since the acquisition of the TOML Group with the ISA later during 2021.

Offtake Agreements,

On May 25, 2012, the Company's wholly owned subsidiary, DGE, and Glencore International AG ("Glencore") entered into a copper offtake agreement and a nickel offtake agreement. DGE has agreed to deliver to Glencore 50% of the annual quantity of copper and nickel produced at a DGE owned processing facility from nodules derived from the NORI Area at LME referenced market pricing with allowances for product quality and delivery location. Both the copper and nickel offtake agreements are for the life of the Company's rights to the NORI Area. Either party may terminate the agreement upon a material breach or insolvency of the other party. Glencore may also terminate the agreement by giving twelve months' notice.

Sponsorship Agreements

On July 5, 2017, the Republic of Nauru ("Nauru"), the Nauru Seabed Minerals Authority and NORI entered into a sponsorship agreement (the "NORI Sponsorship Agreement") formalising certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI Area. Upon reaching a minimum level of nodule production from the tenement area, NORI will pay Nauru a seabed mineral recovery payment based on the wet tonnes of polymetallic nodules recovered from the tenement area. In addition, NORI will pay an administration fee each year to Nauru for such administration and sponsorship, which is subject to review and increase in the event that NORI is granted an ISA exploitation contract.

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9. Commitments (cont.)

On March 8, 2008, the Kingdom of Tonga ("Tonga") and TOML entered into a sponsorship agreement (the "TOML Sponsorship Agreement") formalising certain obligations of the parties in relation to TOML's exploration and potential exploitation of the TOML Area. Upon reaching a minimum recovery level of nodule production from the tenement area, TOML has agreed to pay Tonga a seabed mineral recovery payment based on the wet tonnes of polymetallic nodules recovered from the tenement area. In addition, TOML has agreed to pay the reasonable direct costs incurred by Tonga to administer the ISA obligations of Tonga to the ISA.

10. Supplemental Cash Flow Information

Non-Cash Investing and Financing Activities	**For the three months ended March 31 2021 $**	**For the three months ended March 31 2020 $**
Common Shares issued to settle accounts payable and accrued liabilities. (Note 4)	**12,879,057**	—
Common Shares issued for exploration license acquisition (Note 3)	**—**	27,999,997

11. Segmented Information

The Company's business consists of only one operating segment, namely exploration of seafloor polymetallic nodules, which includes the development of a metallurgical process to treat such seafloor polymetallic nodules. Details on a geographical basis of the Company's long-lived assets are as follows:

Equipment	**March 31 2021 $**	**December 31 2020 $**
Republic of Nauru	**1,195,385**	1,292,308
Tonga	**13,775**	14,892
North America	**2,291**	2,477
Total	**1,211,451**	1,309,677

12. Subsequent Events

In preparing the consolidated financial statements for the period ended March 31, 2021, the Company has evaluated subsequent events for recognition and disclosure through May 26, 2021, the date that these unaudited consolidated financial statements and accompanying notes were available for issuance.

1. A total of 768,462 stock options have been exercised for total proceeds of $605,765, out of which $7,500 was received during the period ended March 31, 2021.

ANNEX A

BUSINESS COMBINATION AGREEMENT

BY AND AMONG

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.,

1291924 B.C. UNLIMITED LIABILITY COMPANY,

AND

DEEPGREEN METALS INC.

DATED AS OF MARCH 4, 2021

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BUSINESS COMBINATION AGREEMENT

This BUSINESS COMBINATION AGREEMENT (this "Agreement"), dated as of March 4, 2021, is made by and among Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub"), and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada (the "Company"). SOAC, NewCo Sub and the Company shall be referred to herein from time to time collectively as the "Parties". Capitalized terms used but not otherwise defined herein have the meanings set forth in Section 1.1.

WHEREAS, (a) SOAC is a blank check company incorporated as a Cayman Islands exempted company on December 18, 2019 and incorporated for the purpose of effecting a merger, share exchange, asset acquisition, share purchase, reorganization or similar business combination with one or more businesses, and (b) NewCo Sub is, as of the date of this Agreement, a wholly-owned Subsidiary of SOAC that was incorporated for purposes of consummating certain transactions contemplated by this Agreement and the applicable Ancillary Documents;

WHEREAS, pursuant to the Governing Documents of SOAC, SOAC is required to provide an opportunity for its shareholders to have their outstanding SOAC Class A Shares redeemed on the terms and subject to the conditions set forth therein in connection with obtaining the SOAC Shareholder Approval;

WHEREAS, as of the date of this Agreement, Sustainable Opportunities Holdings LLC, a Delaware limited liability company (the "Sponsor"), owns 7,410,000 SOAC Class B Shares;

WHEREAS, concurrently with the execution of this Agreement, the Sponsor, Other Class B Shareholders (as defined herein), SOAC and the Company are entering into the sponsor letter agreement (the "Sponsor Letter Agreement"), pursuant to which, among other things, (a) the Sponsor and each Other Class B Shareholder has agreed to (i) vote in favor of this Agreement and the transactions contemplated hereby (including the Transactions) and (ii) waive, subject to, conditioned upon and effective as of immediately prior to, the Effective Time, any adjustment to the conversion ratio set forth in the Governing Documents of SOAC or any other anti-dilution or similar protection with respect to the SOAC Class B Shares owned by him, her or it (whether resulting from the transactions contemplated by the PIPE Subscription Agreements (as defined herein) or otherwise) and (b) the Sponsor has agreed to exchange a certain number of SOAC Shares held by the Sponsor for Vesting Sponsor Shares (as defined herein) and the Sponsor Earnout Shares, in each case, on the terms and subject to the conditions set forth in the Sponsor Letter Agreement;

WHEREAS, prior to the Effective Time, SOAC shall migrate and be continued from the Cayman Islands to British Columbia, Canada and domesticate as a company in British Columbia under Part 9, Division 8 of the *Business Corporations Act* (British Columbia) (the "BCBCA") and Part XII of the Cayman Islands Companies Act (As Revised) (the "SOAC Continuance"), on the terms and subject to the conditions set forth in this Agreement;

WHEREAS, by means of an Arrangement under the BCBCA, at the Effective Time, SOAC, NewCo Sub and the Company shall consummate the Share Exchange and Amalgamation (as defined herein);

WHEREAS, concurrently with the execution of this Agreement, certain investors (collectively, the "PIPE Investors") are entering into a subscription agreement, substantially in the forms attached hereto as Exhibit C and Exhibit D, as applicable (collectively, the "PIPE Subscription Agreements"), pursuant to which, among other things, each PIPE Investor has agreed to subscribe for and purchase on the Closing Date, and SOAC has agreed to issue and sell to each such PIPE Investor on the Closing Date, the number of SOAC Common Shares set forth in the applicable PIPE Subscription Agreement in exchange for the purchase price set forth therein (the equity financing under all PIPE Subscription Agreements, collectively, the "PIPE Financing"), in each case, on the terms and subject to the conditions set forth therein;

WHEREAS, at the Effective Time, following the SOAC Continuance and the PIPE Financing, (i) SOAC will acquire all of the issued and outstanding shares in the capital of the Company from the Company Shareholders in exchange for SOAC Common Shares and Company Earnout Shares by means of an Arrangement under the BCBCA (the "Share Exchange"), (ii) the Company will become a wholly-owned Subsidiary of SOAC, and (iii) the Company and NewCo Sub will amalgamate to continue as one company (the "Surviving Company"), which shall be an unlimited liability company existing under the laws of British Columbia, Canada, in each case, on the terms and subject to the conditions set forth in this Agreement and the Plan of Arrangement and in accordance with the

provisions of applicable Law (collectively, with the Share Exchange, the "Share Exchange and Amalgamation" and, together with the other transactions contemplated by this Agreement, the Plan of Arrangement and the Ancillary Documents, collectively, the "Transactions");

WHEREAS, at the Closing, each of SOAC, the Sponsor, certain Company Shareholders, and each Other Class B Shareholder shall enter into an amended and restated registration rights agreement, substantially in the form attached hereto as Exhibit E (the "Registration Rights Agreement"), pursuant to which, among other things, each of the Sponsor, the Company Shareholders party thereto and each Other Class B Shareholder (a) will agree not to effect any sale or distribution of any Equity Securities of SOAC held by any of them during the lock-up period described therein and (b) will be granted certain registration rights with respect to their respective SOAC Common Shares, in each case, on the terms and subject to the conditions set forth therein;

WHEREAS, the board of directors of SOAC (the "SOAC Board") has (a) approved this Agreement, the Ancillary Documents to which SOAC is or will be a party and the transactions contemplated hereby and thereby (including the SOAC Continuance and the Transactions) and (b) recommended, among other things, approval of this Agreement and the transactions contemplated by this Agreement (including the SOAC Continuance and the Transactions) by the holders of SOAC Common Shares entitled to vote thereon;

WHEREAS, the board of directors of NewCo Sub, and, as applicable, SOAC as sole shareholder of NewCo Sub, have approved this Agreement, the Ancillary Documents to which NewCo Sub is or will be a party and the transactions contemplated hereby and thereby (including the Transactions);

WHEREAS, the board of directors of the Company (the "Company Board") has unanimously (a) determined that the Transactions are in the best interests of the Company and fair to the Company Shareholders, (b) approved this Agreement, the Ancillary Documents to which the Company is or will be a party and the transactions contemplated hereby and thereby (including the Transactions) and (c) recommended, among other things, that the Company Shareholders vote in favor of the Company Arrangement Resolution (as defined herein);

WHEREAS, concurrently with the execution of this Agreement, each Company Shareholder (with respect to all Equity Securities held thereby) and holders of Company Options set forth on Annex A hereto (collectively, the "Supporting Company Shareholders") will duly execute and deliver to SOAC a transaction support agreement, substantially in the form attached hereto as Exhibit F (collectively, the "Transaction Support Agreements"), pursuant to which each such Supporting Company Shareholder will agree to, among other things, (a) support and vote in favor of the Company Arrangement Resolution and any Alternative Transaction and (b) take, or cause to be taken, any actions necessary or advisable to cause certain agreements to be terminated effective as of the Closing;

WHEREAS, each of the Parties intends for Canadian tax purposes that the Share Exchange will occur on a tax deferred basis for certain Canadian resident Company Shareholders who make a joint tax election with SOAC under subsections 85(1) or (2) of the Tax Act; and

WHEREAS, each of the Parties intends for U.S. federal income tax purposes that (a) the SOAC Continuance shall constitute a transaction treated as a "reorganization" within the meaning of Section 368(a)(1)(F) of the Code, (b) the Share Exchange and Amalgamation, viewed together, shall constitute a transaction treated as a "reorganization" within the meaning of Section 368(a) of the Code and (c) this Agreement shall constitute a "plan of reorganization" within the meaning of Treasury Regulations Sections 1.368-2(g) and 1.368-3(a) (clauses (a) to (c), the "Intended Tax Treatment").

NOW, THEREFORE, in consideration of the premises and the mutual promises set forth herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, each intending to be legally bound, hereby agree as follows:

ARTICLE 1
CERTAIN DEFINITIONS

Section 1.1 Definitions. As used in this Agreement, the following terms have the respective meanings set forth below.

"10% Exemption" has the meaning set forth in Section 5.7(b).

"Additional SOAC SEC Reports" has the meaning set forth in Section 4.7.

"Adjusted Equity Value" means the sum of (a) the Equity Value *plus* (b) the Aggregate Company Option Exercise Price, *plus* (c) Net Group Company Cash.

"Affiliate" means, with respect to any Person, any other Person who directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such Person. The term "control" means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of a Person, whether through the ownership of voting securities, by contract or otherwise, and the terms "controlled" and "controlling" have meanings correlative thereto.

"Aggregate Closing PIPE Proceeds" means the aggregate cash proceeds actually received (or deemed received) by the SOAC Parties in respect of the PIPE Financing (whether prior to or on the Closing Date). For the avoidance of doubt, any cash proceeds received (or deemed received) by SOAC or any of its Affiliates in respect of any amounts funded under a PIPE Subscription Agreement prior to the Closing Date and not refunded or otherwise used prior to the Closing shall constitute, and be taken into account for purposes of determining, the Aggregate Closing PIPE Proceeds (without, for the avoidance of doubt, giving effect to, or otherwise taking into account the use of any such proceeds).

"Aggregate Company Option Exercise Price" means the aggregate exercise price that would be paid to the Company in respect of all Company Options (whether vested or unvested) if all Company Options were exercised in full immediately prior to the Effective Time (without giving effect to any "net" exercise or similar concept).

"Aggregate Transaction Proceeds" means an amount equal to (a) the sum of (i) the aggregate cash proceeds available for release to any SOAC Party (or any designees thereof acceptable to the Company) from the Trust Account in connection with the transactions contemplated hereby (after, for the avoidance of doubt, giving effect to the SOAC Shareholder Redemption) and (ii) the Aggregate Closing PIPE Proceeds, *minus* (b) the Unpaid SOAC Expenses and the Unpaid SOAC Liabilities.

"Agreement" has the meaning set forth in the introductory paragraph to this Agreement.

"Allocation Schedule" has the meaning set forth in Section 2.4.

"Allseas Warrant" means that certain warrant issued to Allseas Group S.A. ("Allseas") by the Company on the date hereof, a true and correct copy of which has been made available to SOAC.

"Allseas Observer Letter" means that certain letter issued to Allseas by the Company on the date hereof with respect to rights to designate an observer to the SOAC Board immediately after the Effective Time, a true and correct copy of which has been made available to SOAC.

"Alternative Transaction" has the meaning set forth in Section 9.1.

"Ancillary Documents" means the Registration Rights Agreement, the Sponsor Letter Agreement, the PIPE Subscription Agreements, the Transaction Support Agreements, the Letter of Transmittal and each other agreement, document, instrument and/or certificate executed, or contemplated by this Agreement to be executed, in connection with the transactions contemplated hereby (including in connection with the SOAC Continuance and the Transactions).

"Anti-Corruption Laws" means, collectively, (a) the U.S. Foreign Corrupt Practices Act (FCPA), (b) the *Corruption of Foreign Public Officials Act* (Canada), (c) the UK Bribery Act 2010 and (d) any other anti-bribery or anti-corruption Laws or Orders related to combatting bribery, corruption and money laundering.

"Arrangement" means an arrangement under Part 9, Division 5 of the BCBCA on the terms and subject to the conditions set forth in the Plan of Arrangement, subject to any amendments or variations to the Plan of Arrangement made in accordance with the terms of this Agreement and the Plan of Arrangement or made at the direction of the Court in the Final Order with the prior written consent of SOAC and the Company, such consent not to be unreasonably withheld, conditioned or delayed.

"Arrangement Dissent Rights" means the rights of dissent in respect of the Arrangement described in the Plan of Arrangement.

"Assumed Plan" has the meaning set forth in Section 2.5(a).

"BCBCA" has the meaning set forth in the recitals.

"Business Combination Proposal" has the meaning set forth in Section 5.8.

"Business Day" means a day, other than a Saturday or Sunday, on which commercial banks in New York, New York and Vancouver, British Columbia are open for the general transaction of business.

"CBA" means any collective bargaining agreement or other Contract with any labor union, labor organization, or works council.

"Certificates" has the meaning set forth in Section 2.6(a).

"Change of Control Payment" means (a) any success, change of control, retention, transaction bonus, severance or other similar payment or amount to any Person as a result of or in connection with this Agreement or the transactions contemplated hereby or any other Change of Control Transaction (including any such payments or similar amounts that may become due and payable based upon the occurrence of one or more additional circumstances, matters or events) or (b) any payments made or required to be made pursuant to or in connection with or upon termination of, or any fees, expenses or other payments owing or that will become owing in respect of, any Company Related Party Transaction during the period beginning on the date of the Latest Balance Sheet and ending on the Closing Date.

"Change of Control" or "Change of Control Transaction" means any transaction or series of related transactions (a) under which any Person or one or more Persons that are Affiliates or that are acting as a "group" (as defined in Section 13(d)(3) of the Exchange Act), directly or indirectly, acquires or otherwise purchases (i) another Person or any of its Affiliates or (ii) all or a material portion of assets, businesses or Equity Securities of another Person or (b) that results, directly or indirectly, in the shareholders of a Person as of immediately prior to such transaction holding, in the aggregate, less than fifty percent (50%) of the voting Equity Securities of such Person (or any successor or parent company of such Person) immediately after the consummation thereof (excluding, for the avoidance of doubt, any Earnout Shares and the SOAC Common Shares issuable upon conversion thereof pursuant to Section 2.8) (in the case of each of clause (a) and (b), whether by amalgamation, merger, consolidation, arrangement, tender offer, recapitalization, purchase or issuance of Equity Securities or otherwise).

"Closing" has the meaning set forth in Section 2.3.

"Closing Company Financial Statements" has the meaning set forth in Section 3.4(b).

"Closing Date" has the meaning set forth in Section 2.3.

"Closing Filing" has the meaning set forth in Section 5.4(b).

"Closing Press Release" has the meaning set forth in Section 5.4(b).

"COBRA" means Part 6 of Subtitle B of Title I of ERISA, Section 4980B of the Code and any similar state Law.

"Code" means the U.S. Internal Revenue Code of 1986, as amended.

"Company" has the meaning set forth in the introductory paragraph to this Agreement.

"Company Acquisition Proposal" means (a) any direct or indirect acquisition, in one or a series of transactions, (i) of or with the Company or any of its controlled Affiliates or (ii) of all or a material portion of assets, Equity Securities or businesses of the Company or any of its controlled Affiliates (in the case of each of clause (i) and (ii), whether by merger, amalgamation, consolidation, recapitalization, purchase or issuance of Equity Securities, offer or otherwise), or (b) any equity or similar investment in the Company or any of its controlled Affiliates.

Notwithstanding the foregoing or anything to the contrary herein, none of this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby, including the Convertible Debentures Conversion, shall constitute a Company Acquisition Proposal.

"Company Arrangement Resolution" means a special resolution of the Company Shareholders and holders of Company Options in respect of the Arrangement to be considered at the Company Shareholders Meeting, in substantially the form attached to this Agreement as Exhibit A.

"Company Board" has the meaning set forth in the recitals to this Agreement.

"Company Common Shares" means the common shares in the capital of the Company.

"Company Convertible Debentures" means the outstanding unsecured convertible debentures of the Company issued pursuant to those certain subscription agreements, between the Company and the applicable parties thereto, true and correct copies of which have been made available to SOAC.

"Company D&O Persons" has the meaning set forth in Section 5.14(a).

"Company Designee" has the meaning set forth in Section 5.15(c).

"Company Disclosure Schedules" means the disclosure schedules to this Agreement delivered to SOAC by the Company on the date of this Agreement in connection with the execution of this Agreement.

"Company Earnout Shares" means (i) 5,000,000 Class A Special Shares, (ii) 10,000,000 Class B Special Shares, (iii) 10,000,000 Class C Special Shares, (iv) 20,000,000 Class D Special Shares, (v) 20,000,000 Class E Special Shares, (vi) 20,000,000 Class F Special Shares, (vii) 25,000,000 Class G Special Shares, and (viii) 25,000,000 Class H Special Shares, in each case, in the capital of SOAC following the SOAC Continuance, convertible into SOAC Common Shares and redeemable in accordance with their terms, in each case as set forth in Section 2.8.

"Company Equity Award" means, as of any determination time, each Company Option and each other award to any current or former director, manager, officer, employee, individual independent contractor or other service provider of any Group Company, in its capacity as such, of rights of any kind to receive any Equity Security of any Group Company or benefits measured in whole or in part by reference to any Equity Security of any Group Company, in each case, under any Company Equity Plan or otherwise that is outstanding. For the avoidance of doubt, the Allseas Warrant shall not be deemed a Company Equity Award.

"Company Equity Plan" means the Company stock option plan currently in effect (as amended from time to time) and each other plan that provides for the award to any current or former director, manager, officer, employee, individual independent contractor, consultant or other service provider of any Group Company of rights of any kind to receive Equity Securities of any Group Company or benefits measured in whole or in part by reference to Equity Securities of any Group Company.

"Company Equityholders" means, collectively, the Company Shareholders and the holders of Company Equity Awards as of any determination time prior to the Effective Time.

"Company Expenses" means, as of any determination time, the aggregate amount of fees, expenses, commissions or other amounts incurred by or on behalf of, and otherwise payable (and not otherwise expressly allocated to a SOAC Party pursuant to the terms of this Agreement or any Ancillary Document), whether or not due, by any Group Company in connection with the negotiation, preparation or execution of this Agreement or any Ancillary Documents, the performance of its covenants or agreements in this Agreement or any Ancillary Document or the consummation of the transactions contemplated hereby or thereby, including (a) the fees and expenses of outside legal counsel, accountants, advisors, brokers, investment bankers, consultants or other agents or service providers of any Group Company and (b) any other fees, expenses, commissions or other amounts that are expressly allocated to any Group Company pursuant to this Agreement or any Ancillary Document. Notwithstanding the foregoing or anything to the contrary herein, Company Expenses shall not include any SOAC Expenses.

"Company Fully Diluted Shares" means the sum of (without duplication) (a) the aggregate number of Company Common Shares issued and outstanding immediately prior to the Effective Time determined on an as-converted to Company Common Share basis (including, for the avoidance of doubt, the number of shares of Company Common Shares issuable upon conversion of the Company Preferred Shares and the Company Convertible Debentures, in each case, based on the then applicable conversion ratio or conversion price thereof) and (b) the aggregate number of Company Common Shares issuable upon exercise of all Company Equity Awards (including Company Options, whether vested or unvested). Notwithstanding the foregoing, the Allseas Warrant and any Company Common Shares issuable thereunder shall not be included in any calculation of Company Fully Diluted Shares.

"Company Fundamental Representations" means the representations and warranties set forth in Section 3.1(a) and Section 3.1(b) (Organization and Qualification), Section 3.2(a), Section 3.2(c) and Section 3.2(f) (Capitalization of the Group Companies), Section 3.3 (Authority), Section 3.8(a) (No Company Material Adverse Effect), Section 3.8(b)(iii) (Absence of Changes) and Section 3.17 (Brokers).

"Company Information Circular" means the notice of the Company Shareholders Meeting to be sent to the Company Shareholders, and the accompanying management information circular to be prepared in connection with the Company Shareholders Meeting, together with any amendments thereto or supplements thereof in accordance with the terms of this Agreement.

"Company IT Systems" means all computer systems, Software and hardware, communication systems, servers, network equipment and related documentation, in each case, owned, licensed or leased by a Group Company.

"Company Licensed Intellectual Property" means Intellectual Property Rights owned by any Person (other than a Group Company) that is licensed to any Group Company.

"Company Material Adverse Effect" means any change, event, effect or occurrence that, individually or in the aggregate with any other change, event, effect or occurrence, has had or would reasonably be expected to have a material adverse effect on (a) the business, results of operations, financial condition or assets of the Group Companies, taken as a whole, or (b) the ability of the Company to consummate the Transactions, in each case, in accordance with the terms of this Agreement; provided, however, that, in the case of clause (a), none of the following shall be taken into account in determining whether a Company Material Adverse Effect has occurred or is reasonably likely to occur: any adverse change, event, effect or occurrence arising after the date of this Agreement from or related to (i) general business or economic conditions in or affecting the United States or Canada, or changes therein, or the global economy generally, (ii) any national or international political or social conditions in the United States, Canada or any other country, including the engagement by the United States, Canada or any other country in hostilities, whether or not pursuant to the declaration of a national emergency or war, or the occurrence in any place of any military or terrorist attack, sabotage or cyberterrorism, (iii) changes in conditions of the financial, banking, capital or securities markets generally in the United States, Canada or any other country or region in the world, or changes therein, including changes in interest rates in the United States, Canada or any other country and changes in exchange rates for the currencies of any countries, (iv) changes in any applicable Laws, (v) any change, event, effect or occurrence that is generally applicable to the industries or markets in which any Group Company operates, (vi) the execution or public announcement of this Agreement or the pendency or consummation of the transactions contemplated by this Agreement, including the impact thereof on the relationships, contractual or otherwise, of any Group Company with employees, customers, investors, contractors, lenders, suppliers, vendors, partners, licensors, licensees, payors or other third parties related thereto (provided that the exception in this clause (vi) shall not apply to the representations and warranties set forth in Section 3.5(b), to the extent that its purpose is to address the consequences resulting from the public announcement or pendency or consummation of the transactions contemplated by this Agreement or the condition set forth in Section 6.2(a) to the extent it relates to such representations and warranties), (vii) any failure by any Group Company to meet, or changes to, any internal or published budgets, projections, forecasts, estimates or predictions (although the underlying facts and circumstances resulting in such failure may be taken into account to the extent not otherwise excluded from this definition pursuant to clauses (i) through (vi) or (viii)), or (viii) any hurricane, tornado, flood, earthquake, tsunami, natural disaster, mudslides, wild fires, epidemics, pandemics (including COVID-19) or quarantines, acts of God or other natural disasters or comparable events in the United States, Canada or any other country or region in the world, or any escalation of the foregoing; provided, however, that any change, event, effect or occurrence resulting from a matter described in any of the foregoing clauses (i) through (v) or clause (viii) may be taken into account in determining

whether a Company Material Adverse Effect has occurred or is reasonably likely to occur to the extent such change, event, effect or occurrence has or has had a disproportionate adverse effect on the Group Companies, taken as a whole, relative to other participants operating in the industries or markets in which the Group Companies operate.

"Company Non-Party Affiliates" means, collectively, each Company Related Party and each former, current or future Affiliate, Representative, successor or permitted assign of any Company Related Party (other than, for the avoidance of doubt, the Company). As it relates to the Company, the term "Non-Party Affiliates" means "Company Non-Party Affiliates."

"Company Option" means, as of any determination time, each option to purchase Company Common Shares that is outstanding and unexercised, whether vested or unvested and whether granted under a Company Equity Plan or otherwise.

"Company Owned Intellectual Property" means all Intellectual Property Rights that are owned or held for use by the Group Companies.

"Company Preferred Shares" means the Class B Preferred Shares in the capital of the Company.

"Company Registered Intellectual Property" means all Registered Intellectual Property owned or purported to be owned by, or filed, by or in the name of, any Group Company.

"Company Related Party" has the meaning set forth in Section 3.19.

"Company Related Party Transactions" has the meaning set forth in Section 3.19.

"Company Required Approval" means the approvals of not less than two-thirds of each of (i) the Company Shareholders, and (ii) the Company Shareholders together with holders of Company Options, voting together as a single class, in each case, present in person or by proxy at the Company Shareholders Meeting.

"Company Shareholders" means, collectively, the holders of Company Shares as of any determination time prior to the Effective Time.

"Company Shareholders Meeting" means the meeting of the Company Shareholders and holders of Company Options, including any adjournment or postponement thereof in accordance with the terms of this Agreement, that is to be convened as provided by the Interim Order to consider, and if deemed advisable approve, the Company Arrangement Resolution, and for any other purpose as may be set out in the Company Information Circular and agreed to by SOAC.

"Company Shares" means, collectively, the Company Preferred Shares and the Company Common Shares.

"Confidentiality Agreement" means that certain Confidentiality Agreement by and between the Company and SOAC, as may be amended, modified or supplemented from time to time.

"Consent" means any notice, authorization, qualification, registration, filing, notification, waiver, order, consent or approval to be obtained from, filed with or delivered to, a Governmental Entity or other Person.

"Contract" or "Contracts" means any agreement, contract, license, sublicense, lease, obligation, undertaking or other commitment or arrangement that is legally binding upon a Person or any of his, her or its properties or assets.

"Convertible Debentures Conversion" has the meaning set forth in Section 2.2(c).

"Copyrights" has the meaning set forth in the definition of Intellectual Property Rights.

"Court" means the Supreme Court of British Columbia.

"COVID-19" means SARS-CoV-2 or COVID-19 and any evolutions thereof or related or associated epidemics, pandemic or disease outbreaks.

"Creator" has the meaning set forth in Section 3.13(d).

"Designated Material Contracts" has the meaning set forth in Section 5.1(b)(vi).

"Earnout Period" has the meaning set forth in Section 2.8(b).

"Earnout Shares" means, collectively, the Company Earnout Shares and the Sponsor Earnout Shares.

"Effective Time" means the moment in time at which the Closing occurs.

"Employee Benefit Plan" means each "employee benefit plan" (as such term is defined in Section 3(3) of ERISA, whether or not subject to ERISA) and each other benefit or compensatory plan, program, policy or Contract that any Group Company maintains, sponsors or contributes to, including those relating to employment, incentive, equity or equity-based, severance, change in control and retention, or under or with respect to which any Group Company has any Liability, other than any plan sponsored or maintained by a Governmental Entity.

"Environmental Laws" means all Laws and Orders and recognized and generally accepted good engineering practices and industry standards concerning pollution, the storage, use, treatment, transportation, handling, importation, exportation, sale, distribution, labeling, recycling, processing or testing of, or exposure to, any Hazardous Substance, protection of the environment or human health or safety (including relating to fire protection and safety).

"Equity Securities" means any share, share capital, capital stock, partnership, membership, joint venture or similar interest in any Person (including any stock appreciation, phantom stock, profit participation or similar rights), and any option, warrant, right or security (including debt securities) convertible, exchangeable or exercisable therefor.

"Equity Value" means $2,250,000,000.

"ERISA" means the Employee Retirement Income Security Act of 1974.

"Exchange Act" means the Securities Exchange Act of 1934.

"Exchange Agent" has the meaning set forth in Section 2.6(a).

"Exchange Agent Agreement" has the meaning set forth in Section 2.6(a).

"Exchange Consideration" means, collectively, the SOAC Common Shares Consideration and the Company Earnout Shares.

"Federal Securities Laws" means the Exchange Act, the Securities Act and the other U.S. federal securities laws and the rules and regulations of the SEC promulgated thereunder or otherwise.

"Final Order" means the final order of the Court pursuant to Section 291 of the BCBCA, in a form acceptable to the Company and SOAC, each acting reasonably, approving the Arrangement, as such order may be amended by the Court, or with the consent of both the Company and SOAC, such consent to not be unreasonably withheld, conditioned or delayed, at any time prior to the Effective Time or, if appealed, then, unless such appeal is withdrawn or denied, as affirmed or as amended, on appeal, provided that any such amendment is acceptable to each of both the Company and SOAC, each acting reasonably.

"Financial Statements" has the meaning set forth in Section 3.4(a).

"Foreign Benefit Plan" means each Employee Benefit Plan maintained by any of the Group Companies for its current or former employees, officers, directors or other individual service providers located outside of the United States.

"Fraud" means an act or omission by a Party, and requires: (a) a false or incorrect representation or warranty expressly set forth in this Agreement, (b) with actual knowledge (as opposed to constructive, imputed or implied knowledge) by the Party making such representation or warranty that such representation or warranty expressly set forth in this Agreement is false or incorrect, (c) an intention to deceive another Party, to induce him, her or it to enter into this Agreement, (d) another Party, in justifiable or reasonable reliance upon such false or incorrect representation or warranty expressly set forth in this Agreement, causing such Party to enter into this Agreement, and (e) another Party to suffer damage by reason of such reliance. For the avoidance of doubt, "Fraud" does not include any claim for equitable fraud, promissory fraud, unfair dealings fraud or any torts (including a claim for fraud or alleged fraud) based on negligence or recklessness.

"GAAP" means United States generally accepted accounting principles.

"Governing Documents" means the legal document(s) by which any Person (other than an individual) establishes its legal existence or which govern its internal affairs. For example, the "Governing Documents" of a U.S. corporation are its certificate or articles of incorporation and by-laws, the "Governing Documents" of a British Columbia company are its certificate(s) of incorporation, continuance and/or amalgamation, its notice of articles and articles, the "Governing Documents" of a U.S. limited partnership are its limited partnership agreement and certificate of limited partnership, the "Governing Documents" of a U.S. limited liability company are its operating or limited liability company agreement and certificate of formation and the "Governing Documents" of a Cayman Islands exempted company are its memorandum and articles of association.

"Governmental Entity" means any United States, Canadian, international or other (a) federal, state, provincial, local, municipal or other government entity, (b) governmental or quasi-governmental entity of any nature (including any governmental agency, branch, department, official, or entity and any court or other tribunal) or (c) body exercising or entitled to exercise any administrative, executive, judicial, legislative, police, regulatory, or taxing authority or power of any nature, including any arbitrator or arbitral tribunal (public or private). The term "Governmental Entity" shall include, for the avoidance of doubt, the ISA.

"Group Company" and "Group Companies" means, collectively, the Company and its Subsidiaries.

"Hazardous Substance" means any material, substance or waste that is regulated by, or may give rise to standards of conduct or Liability pursuant to, any Environmental Law, including any petroleum products or byproducts, asbestos, lead, polychlorinated biphenyls, per- and poly-fluoroakyl substances, toxic mold or radon.

"IFRS" means the International Financial Reporting Standards, as adopted by the International Accounting Standards Board, as in effect from time to time.

"Incentive Stock Option" means a Company Option intended to be an "incentive stock option" (as defined in Section 422 of the Code).

"Indebtedness" means, as of any time, without duplication, with respect to any Person, the outstanding principal amount of, accrued and unpaid interest on, fees and expenses arising under or in respect of (a) indebtedness for borrowed money, (b) other obligations evidenced by any note, bond, debenture or other debt security, (c) obligations for the deferred purchase price of property or assets, including "earn-outs" and "seller notes" (but excluding any trade payables arising in the ordinary course of business), (d) reimbursement and other obligations with respect to letters of credit, bank guarantees, bankers' acceptances or other similar instruments, in each case, solely to the extent drawn, (e) leases required to be capitalized under GAAP, (f) derivative, hedging, swap, foreign exchange or similar arrangements, including swaps, caps, collars, hedges or similar arrangements and (g) any of the obligations of any other Person of the type referred to in clauses (a) through (f) above directly or indirectly guaranteed by such Person or secured by any assets of such Person, whether or not such Indebtedness has been assumed by such Person.

"Independent Designee" has the meaning set forth in Section 5.15(d).

"Intellectual Property Rights" means all intellectual property rights and related priority rights protected, created or arising under the Laws of the United States or any other jurisdiction or under any international convention, including all (a) patents and patent applications, industrial designs and design patent rights, including any continuations, divisionals, continuations-in-part and provisional applications and statutory invention registrations, and any patents issuing on any of the foregoing and any reissues, reexaminations, substitutes, supplementary protection certificates, extensions of any of the foregoing (collectively, "Patents"); (b) trademarks, service marks, trade names, service names, brand names, trade dress rights, logos, Internet domain names, corporate names and other source or business identifiers, together with the goodwill associated with any of the foregoing, and all applications, registrations, extensions and renewals of any of the foregoing (collectively, "Marks"); (c) copyrights and works of authorship, database and design rights, mask work rights and moral rights, whether or not registered or published, and all registrations, applications, renewals, extensions and reversions of any of any of the foregoing (collectively, "Copyrights"); (d) trade secrets, know-how and confidential and proprietary information, including invention disclosures, inventions and formulae, whether patentable or not; (e) rights in or to Software or other technology; and (f) any other intellectual or proprietary rights protectable, arising under or associated with any of the foregoing, including those protected by any Law anywhere in the world.

"Intended Tax Treatment" has the meaning set forth in the recitals to this Agreement.

"Interim Order" means the interim order of the Court contemplated by Section 2.1(a) of this Agreement and made pursuant to Section 291 of the BCBCA, in a form acceptable to the Company and SOAC, each acting reasonably, providing for, among other things, the calling and holding of the Company Shareholders Meeting, as the same may be amended by the Court or with the consent of SOAC and the Company, such consent not to be unreasonably withheld, conditioned or delayed, provided that any such amendment is reasonably acceptable to each of the Company and SOAC.

"Investment Canada Act" means the *Investment Canada Act* (Canada).

"Investment Canada Act Approval" means, if either Party determines, acting reasonably, that an application for review under Part IV is required or appropriate in respect of the transactions contemplated by this Agreement, the approval or deemed approval by the applicable minister under Part IV of the Investment Canada Act.

"Investment Company Act" means the Investment Company Act of 1940.

"IPO" has the meaning set forth in Section 9.18.

"ISA" means the International Seabed Authority.

"JOBS Act" means the Jumpstart Our Business Startups Act of 2012.

"Latest Balance Sheet" has the meaning set forth in Section 3.4(a).

"Law" means any federal, state, local, provincial, foreign, national or supranational statute, law (including common law), act, statute, ordinance, treaty, rule, code, regulation or other binding directive or guidance issued, promulgated or enforced by a Governmental Entity having jurisdiction over a given matter, including the UNCLOS Laws and Regulations.

"Leased Real Property" has the meaning set forth in Section 3.18(b).

"Letter of Transmittal" means the letter of transmittal as mutually agreed to by each of the Exchange Agent, SOAC and the Company (such agreement not to be unreasonably withheld, conditioned or delayed in the case of SOAC or the Company, as applicable) (which, for the avoidance of doubt, shall include a waiver of dissent rights, a grant of an irrevocable proxy and powers of attorney and an agreement to vote in a manner consistent with the holders of SOAC Common Shares, in each case, by the applicable by the applicable holder of Company Earnout Shares).

"Liability" or "liability" means any and all debts, liabilities and obligations, whether accrued or fixed, absolute or contingent, known or unknown, matured or unmatured or determined or determinable, including those arising under any Law (including any Environmental Law), Proceeding or Order and those arising under any Contract, agreement, arrangement, commitment or undertaking.

"Lien" means any mortgage, pledge, security interest, encumbrance, lien, license or sub-license, charge or other similar encumbrance or interest (including, in the case of any Equity Securities, any voting, transfer or similar restrictions).

"Marks" has the meaning set forth in the definition of Intellectual Property Rights.

"Material Contracts" has the meaning set forth in Section 3.7(a).

"Material Exploration Contracts" means such exploration Contracts set forth in Section 3.7(a)(i) of the Company Disclosure Schedules.

"Material Permits" has the meaning set forth in Section 3.6.

"Misrepresentation" means an untrue statement of a material fact or an omission to state a material fact that is required to be stated or that is necessary to make a statement not misleading in light of the circumstances in which it was made.

"Multiemployer Plan" has the meaning set forth in Section 3(37) or Section 4001(a)(3) of ERISA.

"Nasdaq" means The Nasdaq Stock Market, LLC.

"Net Group Company Cash" means, with respect to the Group Companies, as of the close of business on the last Business Day prior to the Closing, (a) the sum of the fair market value (expressed in United States dollars) of all cash and cash equivalents, *minus* (b) any fees, costs or expenses payable by any Group Company that are more than 60 days past due excluding, in each case, all fees and expenses incurred in connection with this Agreement, the Ancillary Documents and the transactions contemplated hereby and thereby, including the fees and disbursements of counsel, financial advisors and accountants, *minus* (c) the sum of Indebtedness of the Group Companies; provided, that such number shall not be a negative number and shall not exceed $25,000,000. For the avoidance of doubt, clause (a) of this definition shall (i) be calculated net of outstanding checks, drafts and wires issued by the Group Company, including overdrafts and (ii) include checks on hand, drafts and wires received or deposited for the account of the Group Company, including deposits in transit. Notwithstanding anything to the contrary herein, Net Group Company Cash shall not include (x) cash deposits (including, for the avoidance of doubt, all cash deposits in respect of Leased Real Property or otherwise and all pre-funded customer cash deposits), cash in reserve accounts, cash escrow accounts, custodial cash and cash subject to a lockbox, dominion, control of similar agreement or otherwise subject to any legal or contractual restriction on the ability to freely use such cash for any lawful purposes, or (y) insurance proceeds received by any of the Group Companies since the Latest Balance Sheet for any damage to its or their respective assets that have not been fully repaired, restored or replaced prior to such measurement time.

"NewCo Sub" has the meaning set forth in the introductory paragraph to this Agreement.

"Non-Offering Prospectus" has the meaning set forth in Section 5.7(b).

"NYSE" means the New York Stock Exchange.

"NYSE Proposal" has the meaning set forth in Section 5.8.

"Off-the-Shelf Software" means any Software that is made generally and widely available to the public on a commercial basis and is licensed to any of the Group Companies on a non-exclusive basis under standard terms and conditions for a one-time license fee of less than $250,000 per license or an ongoing license fee of less than $150,000 per year.

"Officer" has the meaning set forth in Section 5.15(a).

"Order" means any writ, order, judgment, injunction, decision, determination, award, ruling, subpoena, verdict or decree entered, issued or rendered by any Governmental Entity.

"Other Class B Shareholders" means, collectively, Rick Gaenzle, Isaac Barchas and Justin Kelly.

"Parties" has the meaning set forth in the introductory paragraph to this Agreement.

"Patents" has the meaning set forth in the definition of Intellectual Property Rights.

"PCAOB" means the Public Company Accounting Oversight Board.

"Per Share Consideration" means (a) the number of SOAC Common Shares equal to the SOAC Common Shares Consideration *divided* by (b) the number of Company Fully Diluted Shares.

"Permits" means any approvals, authorizations, clearances, licenses, registrations, permits or certificates of a Governmental Entity.

"Permitted Liens" means (a) mechanic's, materialmen's, carriers', repairers' and other similar statutory Liens arising or incurred in the ordinary course of business for amounts that are not yet delinquent or are being contested in good faith by appropriate proceedings and for which sufficient reserves have been established in accordance with GAAP, (b) Liens for Taxes, assessments or other governmental charges not yet due and payable as of the Closing Date or which are being contested in good faith by appropriate proceedings and for which sufficient reserves have been established in accordance with GAAP, (c) encumbrances and restrictions on real property (including easements, covenants, conditions, rights of way and similar restrictions) that do not prohibit or materially interfere with any of the Group Companies' use or occupancy of such real property, (d) zoning, building codes and other land use Laws regulating the use or occupancy of real property or the activities conducted thereon which are imposed by any Governmental Entity having jurisdiction over such real property and which are not violated by the use or occupancy of such real property or the operation of the businesses of the Group Company and do not prohibit or materially

interfere with any of the Group Companies' use or occupancy of such real property, (e) cash deposits or cash pledges to secure the payment of workers' compensation, unemployment insurance, social security benefits or obligations arising under similar Laws or to secure the performance of public or statutory obligations, surety or appeal bonds, and other obligations of a like nature, in each case in the ordinary course of business and which are not yet due and payable, (f) grants by any Group Company of non-exclusive rights in non-material Intellectual Property Rights in the ordinary course of business consistent with past practice and (g) other Liens that do not materially and adversely affect the value, use or operation of the asset subject thereto.

"Person" means an individual, partnership, corporation, limited liability company, joint stock company, unincorporated organization or association, trust, joint venture or other similar entity, whether or not a legal entity.

"Personal Data" means any data (a) relating to an identified or identifiable natural person, or (b) that is otherwise subject to any applicable Laws or any privacy policies of the Company governing data relating to an identified or identifiable natural persons.

"PFIC" has the meaning set forth in Section 5.5(d).

"PIPE Financing" has the meaning set forth in the recitals to this Agreement.

"PIPE Investors" has the meaning set forth in the recitals to this Agreement.

"PIPE Subscription Agreements" has the meaning set forth in the recitals to this Agreement.

"Plan of Arrangement" means the Plan of Arrangement in substantially the form attached hereto as Exhibit B, with such changes as may be mutually agreed to by SOAC and the Company (such agreement not to be unreasonably withheld, conditioned or delayed by either SOAC or the Company, as applicable).

"Policy" has the meaning set forth in Section 5.7(b).

"Pre-Closing SOAC Governing Documents" means, collectively, (a) the Amended and Restated Memorandum of Association of SOAC, dated as of May 5, 2020, and (b) the Amended and Restated Articles of Association of SOAC, dated as of May 5, 2020.

"Pre-Closing SOAC Shareholders" means the holders of SOAC Common Shares as of any determination time prior to the Effective Time.

"Preferred Share Conversion" has the meaning set forth in Section 2.2(b).

"Privacy and Data Security Policies" has the meaning set forth in Section 3.20(a).

"Privacy Laws" means any of the following to the extent relating to the Processing of Personal Data or data-related notifications: (a) all applicable Laws; (b) each Group Company's own external-facing privacy policies; and (c) applicable provisions of Contracts to which any Group Company is a party or is otherwise bound.

"Proceeding" means any lawsuit, litigation, action, audit, examination, claim, complaint, charge, proceeding, suit or arbitration (in each case, whether civil, criminal or administrative and whether public or private) pending by or before or otherwise involving any Governmental Entity.

"Process" (or "Processing" or "Processes") means the collection, use, storage, processing, recording, distribution, transfer, import, export, protection (including security measures), disposal or disclosure or other activity regarding data (whether electronically or in any other form or medium).

"Prospectus" has the meaning set forth in Section 9.18.

"Public Shareholders" has the meaning set forth in Section 9.18.

"Public Software" means any Software that contains, includes, incorporates, or has instantiated therein, or is derived in any manner (in whole or in part) from, any Software that is distributed as free software, open source software (*e.g.*, Linux) or similar licensing or distribution models, including under any terms or conditions that impose any requirement that any Software using, linked with, incorporating, distributed with or derived from such Public Software (a) be made available or distributed in source code form; (b) be licensed for purposes of making derivative works; or (c) be redistributable at no, or a nominal, charge.

"Real Property Leases" means all leases, sub-leases, licenses, or other agreements, in each case, pursuant to which any Group Company leases or sub-leases any real property.

"Reference Date" means January 1, 2017.

"Registered Intellectual Property" means all issued Patents, pending Patent applications, registered Marks, pending applications for registration of Marks, registered Copyrights, pending applications for registration of Copyrights and Internet domain name registrations.

"Registration Rights Agreement" has the meaning set forth in the recitals to this Agreement.

"Registration Statement/Proxy Statement" means a registration statement on Form S-4 relating to the transactions contemplated by this Agreement and the Ancillary Documents and containing a prospectus and proxy statement of SOAC.

"Regulatory Permits" means all Permits granted by ISA or any Governmental Entity to any Group Company.

"Representatives" means with respect to any Person, such Person's Affiliates and its and such Affiliates' respective directors, managers, officers, employees, accountants, consultants, advisors, attorneys, agents and other representatives.

"Required Governing Document Proposal" has the meaning set forth in Section 5.8.

"Required Transaction Proposals" means, collectively, the Business Combination Proposal, the SOAC Continuance Proposal, the NYSE Proposal and the Required Governing Document Proposal.

"Rollover Option" has the meaning set forth in Section 2.5.

"Sanctions and Export Control Laws" means any Law or Order related to (a) import and export controls, including the U.S. Export Administration Regulations, the International Traffic in Arms Regulations and such other controls administered by the U.S. Customs and Border Protection, (b) economic sanctions, including those administered by the Office of Foreign Assets Control of the U.S. Department of the Treasury, the U.S. Department of State, Global Affairs Canada, the European Union, any European Union Member State, the United Nations, and Her Majesty's Treasury of the United Kingdom or any other similar Governmental Entity with jurisdiction over any Group Company from time to time or (c) anti-boycott measures.

"Sarbanes-Oxley Act" means the Sarbanes-Oxley Act of 2002.

"Schedules" means, collectively, the Company Disclosure Schedules and the SOAC Disclosure Schedules.

"SEC" means the U.S. Securities and Exchange Commission.

"Securities Act" means the U.S. Securities Act of 1933.

"Securities Laws" means Federal Securities Laws and other applicable foreign and domestic securities or similar Laws (including the applicable Canadian provincial and territorial securities laws).

"Security Incident" means any action that results in an actual cyber or security incident that could have an adverse effect on a Company IT System, Personal Data or any Company trade secret (including any Processed thereby or contained therein), including an occurrence that actually jeopardizes the confidentiality, integrity, or availability of a Company IT System, Personal Data or any Company trade secret.

"Share Exchange" has the meaning set forth in the recitals to this Agreement.

"Share Exchange and Amalgamation" has the meaning set forth in the recitals to this Agreement.

"Signing Filing" has the meaning set forth in Section 5.4(b).

"Signing Press Release" has the meaning set forth in Section 5.4(b).

"SOAC" means (a) prior to the consummation of the SOAC Continuance, Sustainable Opportunities Acquisition Corp., an exempted company incorporated in the Cayman Islands with limited liability, and (b) from and after the consummation of the SOAC Continuance, SOAC as continued under the laws of in British Columbia,

Canada, and anticipated to be named TMC the metals company Inc., a company existing under the laws of British Columbia, Canada. Any reference to SOAC in this Agreement or any Ancillary Document shall be deemed to refer to clause (a) and/or (b) as the context so requires.

"SOAC Acquisition Proposal" means any direct or indirect acquisition (or other business combination), in one or a series of related transactions, by SOAC (a) of or with an unaffiliated entity or (b) of all or a material portion of the assets, Equity Securities or businesses of an unaffiliated entity (in the case of each of clause (a) and (b), whether by merger, consolidation, recapitalization, purchase or issuance of Equity Securities, tender offer or otherwise). Notwithstanding the foregoing or anything to the contrary herein, none of this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby shall constitute a SOAC Acquisition Proposal.

"SOAC Articles" has the meaning set forth in Section 2.2(a).

"SOAC Board" has the meaning set forth in the recitals to this Agreement.

"SOAC Board Recommendation" has the meaning set forth in Section 5.8.

"SOAC Canadian Shareholders" has the meaning set forth in Section 5.7(b).

"SOAC Class A Shares" means, prior to the SOAC Continuance, SOAC's Class A ordinary shares.

"SOAC Class B Shares" means, prior to the SOAC Continuance, SOAC's Class B ordinary shares.

"SOAC Common Shares" means the common shares in the capital of SOAC after giving effect to the SOAC Continuance.

"SOAC Common Shares Consideration" means the aggregate number of SOAC Common Shares equal to (a) the Adjusted Equity Value *divided* by (b) $10.00.

"SOAC Continuance" has the meaning set forth in the recitals to this Agreement.

"SOAC Continuance Proposal" has the meaning set forth in Section 5.8.

"SOAC D&O Persons" has the meaning set forth in Section 5.13(a).

"SOAC Designee" has the meaning set forth in Section 5.15(b).

"SOAC Disclosure Schedules" means the disclosure schedules to this Agreement delivered to the Company by SOAC on the date of this Agreement in connection with the execution of this Agreement.

"SOAC Expenses" means, as of any determination time, the aggregate amount of fees, expenses, commissions or other amounts incurred by or on behalf of, or otherwise payable (and not otherwise expressly allocated to a Group Company or any Company Equityholder pursuant to the terms of this Agreement or any Ancillary Document), whether or not due, by a SOAC Party in connection with the negotiation, preparation or execution of this Agreement or any Ancillary Documents, the performance of its covenants or agreements in this Agreement or any Ancillary Document or the consummation of the transactions contemplated hereby or thereby, including (a) the fees and expenses of outside legal counsel, accountants, advisors, brokers, investment bankers, consultants, or other agents or service providers of any SOAC Party and (b) any other fees, expenses, commissions or other amounts that are expressly allocated to any SOAC Party pursuant to this Agreement or any Ancillary Document. Notwithstanding the foregoing or anything to the contrary herein, SOAC Expenses shall not include any Company Expenses.

"SOAC Financial Statements" means all of the financial statements of SOAC included in the SOAC SEC Reports.

"SOAC Fundamental Representations" means the representations and warranties set forth in Section 4.1 (Organization and Qualification), Section 4.2 (Authority), Section 4.4 (Brokers), Section 4.6 (Capitalization of the SOAC Parties) and Section 4.16 (SOAC Expenses).

"SOAC Incentive Equity Plan" has the meaning set forth in Section 5.17.

"SOAC Information" has the meaning set forth in Section 2.1(c)(ii).

"SOAC Liabilities" means, as of any determination time, the aggregate amount of Liabilities of the SOAC Parties that are due and payable by the SOAC Parties as of such time. Notwithstanding the foregoing or anything to the contrary herein, SOAC Liabilities shall not include (a) any SOAC Expenses or (b) any Liabilities arising out of, or related to, any Proceeding related to this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby, including any shareholder demand or other shareholder Proceedings (including derivative claims) arising out of, or related to, any of the foregoing.

"SOAC Material Adverse Effect" means any change, event, effect or occurrence that, individually or in the aggregate with any other change, event, effect or occurrence, has had or would reasonably be expected to have a material adverse effect on (a) the business or financial condition of the SOAC Parties, taken as a whole, or (b) the ability of any SOAC Party to consummate the Transactions, in each case, in accordance with the terms of this Agreement; provided, however, that, in the case of clause (a), none of the following shall be taken into account in determining whether a SOAC Material Adverse Effect has occurred or is reasonably likely to occur: any adverse change, event, effect or occurrence arising after the date of this Agreement from or related to (i) general business or economic conditions in or affecting the United States or Canada, or changes therein, or the global economy generally, (ii) any national or international political or social conditions in the United States, Canada or any other country, including the engagement by the United States, Canada or any other country in hostilities, whether or not pursuant to the declaration of a national emergency or war, or the occurrence in any place of any military or terrorist attack, sabotage or cyberterrorism, (iii) changes in conditions of the financial, banking, capital or securities markets generally in the United States, Canada or any other country or region in the world, or changes therein, including changes in interest rates in the United States, Canada or any other country and changes in exchange rates for the currencies of any countries, (iv) changes in any applicable Laws, (v) any change, event, effect or occurrence that is generally applicable to the industries or markets in which any SOAC Party operates, (vi) the execution or public announcement of this Agreement or the pendency or consummation of the transactions contemplated by this Agreement, including the impact thereof on the relationships, contractual or otherwise, of any SOAC Party with employees, customers, investors, contractors, lenders, suppliers, vendors, partners, licensors, licensees, payors or other third parties related thereto (provided that the exception in this clause (vi) shall not apply to the representations and warranties set forth in Section 4.3(b), to the extent that its purpose is to address the consequences resulting from the public announcement or pendency or consummation of the transactions contemplated by this Agreement or the condition set forth in Section 6.3(a) to the extent it relates to such representations and warranties), (vii) any failure by any SOAC Party to meet, or changes to, any internal or published budgets, projections, forecasts, estimates or predictions (although the underlying facts and circumstances resulting in such failure may be taken into account to the extent not otherwise excluded from this definition pursuant to clauses (i) through (vi) or (viii)), (viii) any hurricane, tornado, flood, earthquake, tsunami, natural disaster, mudslides, wild fires, epidemics, pandemics (including COVID-19) or quarantines, acts of God or other natural disasters or comparable events in the United States, Canada or any other country or region in the world, or any escalation of the foregoing, or (ix) the matters set forth on Section 1.1 of the SOAC Disclosure Schedules; provided, however, that any change, event, effect or occurrence resulting from a matter described in any of the foregoing clauses (i) through (v) or clause (viii) may be taken into account in determining whether a SOAC Material Adverse Effect has occurred or is reasonably likely to occur to the extent such change, event, effect or occurrence has or has had a disproportionate adverse effect on the SOAC Parties, taken as a whole, relative to other participants operating in the industries or markets in which the SOAC Parties operate.

"SOAC Non-Party Affiliates" means, collectively, each SOAC Related Party and each of the former, current or future Affiliates, Representatives, successors or permitted assigns of any SOAC Related Party (other than, for the avoidance of doubt, SOAC).

"SOAC Notice of Articles" has the meaning set forth in Section 2.2(a).

"SOAC Parties" means, collectively, SOAC and NewCo Sub.

"SOAC Related Parties" has the meaning set forth in Section 4.9.

"SOAC Related Party Transactions" has the meaning set forth in Section 4.9.

"SOAC SEC Reports" has the meaning set forth in Section 4.7.

"SOAC Shareholder Approval" means the approval of each Required Transaction Proposal by the affirmative vote of the holders of the requisite number of SOAC Shares entitled to vote thereon, whether in person or by proxy at the SOAC Shareholders Meeting (or any adjournment thereof), in accordance with the Governing Documents of SOAC and applicable Law.

"SOAC Shareholder Redemption" means the right of the holders of SOAC Class A Shares to redeem all or a portion of their SOAC Class A Shares (in connection with the transactions contemplated by this Agreement or otherwise) as set forth in Governing Documents of SOAC.

"SOAC Shareholders Meeting" has the meaning set forth in Section 5.8.

"SOAC Shares" means (a) prior to the SOAC Continuance, collectively, the SOAC Class A Shares and the SOAC Class B Shares, and (b) from and after the SOAC Continuance, the SOAC Common Shares. Any reference to the SOAC Shares in this Agreement or any Ancillary Document shall be deemed to refer to clause (a) and/or clause (b) of this definition, as the context so requires.

"SOAC Warrants" means each warrant to purchase one SOAC Class A Share at an exercise price of $11.50 per share, subject to adjustment, on the terms and subject to the conditions set forth in the Warrant Agreement.

"Software" shall mean any and all (a) computer programs and software, including any and all software implementations of algorithms, models and methodologies, whether in (and including all) source code or object code; (b) databases and compilations, including any and all data and collections of data, whether machine readable or otherwise; (c) descriptions, flowcharts and other work product used to design, plan, organize and develop any of the foregoing, screens, user interfaces, report formats, firmware, development tools, templates, menus, buttons and icons; and (d) all documentation, including user manuals and other training documentation, related to any of the foregoing.

"Sponsor" has the meaning set forth in the recitals to this Agreement.

"Sponsor Earnout Shares" means 500,000 Class I Special Shares in the capital of SOAC following the SOAC Continuance, convertible into SOAC Common Shares and redeemable in accordance with their terms, in each case as set forth in Section 2.8.

"Sponsor Letter Agreement" has the meaning set forth in the recitals to this Agreement.

"Subsidiary" means, with respect to any Person, any corporation, limited liability company, partnership or other legal entity of which (a) if a corporation, a majority of the total voting power of shares entitled (without regard to the occurrence of any contingency) to vote in the election of directors, managers or trustees thereof is at the time owned or controlled, directly or indirectly, by such Person or one or more of the other Subsidiaries of such Person or a combination thereof, or (b) if a limited liability company, partnership, association or other business entity (other than a corporation), a majority of the partnership or other similar ownership interests thereof is at the time owned or controlled, directly or indirectly, by such Person or one or more Subsidiaries of such Person or a combination thereof and for this purpose, a Person or Persons own a majority ownership interest in such a business entity (other than a corporation) if such Person or Persons shall be allocated a majority of such business entity's gains or losses or shall be a, or control any, managing director or general partner of such business entity (other than a corporation). The term "Subsidiary" shall include all Subsidiaries of such Subsidiary.

"Supporting Company Shareholders" has the meaning set forth in the recitals to this Agreement.

"Surviving Company" has the meaning set forth in the recitals to this Agreement.

"Tax" means any federal, provincial, state or local income, gross receipts, franchise, estimated, alternative minimum, sales, use, transfer, value added, excise, stamp, customs, duties, ad valorem, real property, personal property (tangible and intangible), capital stock, social security, unemployment, payroll, wage, employment, severance, occupation, registration, environmental, communication, mortgage, profits, license, lease, service, goods and services, withholding, premium, turnover, windfall profits or other taxes of any kind whatever, whether computed on a separate or combined, unitary or consolidated basis or in any other manner, together with any interest, deficiencies, penalties, additions to tax, or additional amounts imposed by any Governmental Entity with respect thereto, whether disputed or not, and including any secondary Liability for any of the aforementioned.

"Tax Act" means the *Income Tax Act* (Canada) and the regulations promulgated thereunder.

"Tax Authority" means any Governmental Entity responsible for the collection or administration of Taxes or Tax Returns.

"Tax Return" means returns, information returns, statements, declarations, claims for refund, schedules, designations, elections, notices, attachments and reports relating to Taxes required to be filed with any Governmental Entity, including any amendment of any of the foregoing.

"Termination Date" has the meaning set forth in Section 7.1(d).

"Trading Day" means any day on which SOAC Common Shares are actually traded on the principal securities exchange or securities market on which SOAC Common Shares are then traded.

"Transactions" has the meaning set forth in the recitals to this Agreement.

"Transaction Litigation" has the meaning set forth in Section 5.2(d).

"Transaction Proposals" has the meaning set forth in Section 5.8.

"Transaction Support Agreements" has the meaning set forth in the recitals to this Agreement.

"Trust Account" has the meaning set forth in Section 9.18.

"Trust Account Released Claims" has the meaning set forth in Section 9.18.

"Trust Agreement" has the meaning set forth in Section 4.8.

"Trustee" has the meaning set forth in Section 4.8.

"UNCLOS Laws and Regulations" means the United Nations Convention for the Law of the Sea ("UNCLOS") and all related Laws, conventions, international agreements, and implementing agreements, including (a) the Agreement relating to the Implementation of Part XI of UNCLOS, (b) the Laws administered by the ISA, and (c) any applicable customary international Law.

"Unpaid SOAC Expenses" means the SOAC Expenses that are unpaid as of immediately prior to the Closing.

"Unpaid SOAC Liabilities" means the SOAC Liabilities as of immediately prior to the Closing.

"Unpaid Company Expenses" means the Company Expenses that are unpaid as of immediately prior to the Closing.

"Vesting Sponsor Shares" has the meaning set forth in the Sponsor Letter Agreement.

"WARN" means the Worker Adjustment Retraining and Notification Act of 1988 as well as similar foreign, state or local Laws.

"Warrant Agreement" means the Warrant Agreement, dated as of May 8, 2020, by and between SOAC and the Trustee.

"Willful Breach" means a material breach of this Agreement by a Party that is a consequence of an act undertaken or a failure to act by the breaching Party with the knowledge that the taking of such act or such failure to act would, or would reasonably be expected to, constitute or result in a breach of this Agreement.

ARTICLE 2
THE ARRANGEMENT; THE TRANSACTION; CLOSING

Section 2.1 **The Arrangement**. On the terms and subject to the conditions hereof, the Company and SOAC shall proceed to effect the Arrangement under Part 9, Division 5 of the BCBCA at the Effective Time, on the terms and subject to the conditions set forth in the Plan of Arrangement.

(a) The Interim Order. As soon as reasonably practicable after the date of this Agreement, but in any event no later than three (3) Business Days after the initial filing with the SEC of the Registration Statement/Proxy Statement, the Company shall apply, pursuant to Part 9, Division 5 of the BCBCA and, in cooperation with SOAC (which shall include the opportunity to review of all relevant documents by SOAC and the incorporation of all reasonable comments from SOAC thereon), prepare, file and diligently pursue an application to the Court for the Interim Order in respect of the Arrangement, which shall identify that the Transaction Support Agreements have been executed by each of the Supporting Company Shareholders and shall provide, among other things:

(i) for the class(es) of persons to whom notice is to be provided in respect of the Arrangement and the Company Shareholders Meeting, and for the manner in which such notice is to be provided;

(ii) that the required level of approval for the Company Arrangement Resolution shall be the Company Required Approval;

(iii) that, in all other respects, the terms, restrictions and conditions of the Governing Documents of the Company, including quorum requirements and all other matters, shall apply in respect of the Company Shareholders Meeting;

(iv) for the grant of the Arrangement Dissent Rights to those Company Shareholders who are registered Company Shareholders as contemplated by the Plan of Arrangement;

(v) for the notice requirements regarding the presentation of the application to the Court for the Final Order;

(vi) that, subject to Section 2.2(b), the Company Shareholders Meeting may be adjourned or postponed from time to time by the Company in accordance with the terms of this Agreement or as otherwise agreed by the Parties without the need for additional approval of the Court, and may be held virtually;

(vii) that the record date for the Company Shareholders and holders of Company Options entitled to notice of and to vote at the Company Shareholders Meeting will not change in respect of any adjournment(s) or postponement(s) of the Company Shareholders Meeting, unless required by applicable Law or by the Court;

(viii) confirmation of the record date for the purposes of determining the Company Shareholders entitled to receive material and vote at the Company Meeting in accordance with the Interim Order; and

(ix) for such other matters as the Parties may agree are reasonably necessary to complete the Transactions.

(b) The Company Shareholders Meeting.

(i) Subject to the terms of this Agreement, the Interim Order, and the provision of the SOAC Information, the Company shall convene and conduct the Company Shareholders Meeting in accordance with the Governing Documents of the Company, applicable Laws and the Interim Order as soon as reasonably practicable (and in any event no later than 45 days after the filing of the Registration Statement/Proxy Statement or such later date as may be required in order to provide the Pre-Closing SOAC Shareholders with additional disclosure as required in connection with the SEC Review of the Registration Statement/Proxy Statement), and shall not adjourn, postpone or cancel (or propose the adjournment, postponement or cancellation of) the Company Shareholders Meeting without the prior written consent of SOAC, except in the case of an adjournment as required for quorum purposes. The Company shall consult with SOAC in fixing the record date for the Company Shareholders Meeting and the date of the Company Shareholders Meeting, give notice to SOAC of the Company Shareholders Meeting and allow SOAC's Representatives to attend the Company Shareholders Meeting. The Company shall use its reasonable

best efforts to obtain the Company Required Approval in respect of the Company Arrangement Resolution, including instructing the management proxyholders named in the Company Information Circular to vote any discretionary or blank proxy submitted by the Company Shareholders in favor of such action, and shall take all other action reasonably necessary or advisable to secure the Company Required Approval.

(ii) The Company shall provide SOAC with (A) updates with respect to the aggregate tally of the proxies received by the Company in respect of the Company Arrangement Resolution, (B) updates with respect to any communication (written or oral) from any Company Shareholder in opposition to the Arrangement or any purported exercise or withdrawal of Arrangement Dissent Rights, (C) the right to demand postponement or adjournment of the Company Shareholders Meeting if, based on the tally of proxies, the Company will not receive the Company Required Approvals; provided, that the Company shall not be permitted to postpone the Company Shareholders Meeting more than the earlier of (1) five (5) Business Days prior to the Termination Date and (2) ten (10) days from the date of the first Company Shareholders Meeting without the prior written consent of SOAC, and (D) the right to review and comment on all communications sent to the Company Shareholders and to participate in any discussions, negotiations or Proceedings with or including any such Company Shareholders. The Company shall not (y) make any payment or settlement offer, or agree to any payment or settlement prior to the Effective Time with respect to Arrangement Dissent Rights, or (z) waive any failure by any Company Shareholder to timely deliver a notice of exercise of Arrangement Dissent Rights, in each case without the prior written consent of SOAC, which will not be unreasonably withheld, conditioned or delayed.

(c) The Company Information Circular.

(i) The Company shall promptly prepare and complete, in good faith consultation with SOAC, the Company Information Circular together with any other documents required by applicable Law in connection with the Company Shareholders Meeting and the Arrangement, and the Company shall, as promptly as practicable after obtaining the Interim Order, cause the Company Information Circular and such other documents to be delivered to each Company Shareholder and other person as required by the Interim Order and applicable Law, in each case so as to permit the Company Shareholders Meeting to be held by the time specified in Section 2.1(b)(i).

(ii) The Company shall ensure that the Company Information Circular (A) complies in all material respects with the Governing Documents of the Company, the Interim Order and applicable Law, (B) does not contain any Misrepresentation, except with respect to SOAC Information included in the Company Information Circular, (C) provides the Company Shareholders with sufficient information (explained in sufficient detail) to permit them to form a reasoned judgement concerning the matters to be placed before the Company Shareholders Meeting, and (D) states any material interest of each director and officer, whether as director, officer, securityholder or creditor of the Company, as and to the extent required by applicable Law.

(iii) Without limiting the generality of Section 2.1(c)(ii), the Company shall, subject to the terms of this Agreement, ensure that the Company Information Circular includes (A) a statement that the Company Board has unanimously determined that the Arrangement is in the best interests of the Company and fair to the Company Shareholders, and recommends that the Company Shareholders vote in favor of the Company Arrangement Resolution and (B) a statement that each Supporting Company Shareholder has entered into a Transaction Support Agreement pursuant to which such Supporting Company Shareholder has agreed to support and vote in favor of the Company Arrangement Resolution.

(iv) SOAC shall reasonably assist the Company in the preparation of the Company Information Circular, including obtaining and furnishing to the Company any information with respect to SOAC required to be included under applicable Laws in the Company Information Circular (the "SOAC Information"), and ensuring that the SOAC Information does not contain any Misrepresentation. The Company shall give SOAC and its legal counsel a reasonable opportunity to review and comment on drafts of the Company Information Circular and other related documents, and shall accept the reasonable comments made by SOAC and its counsel, and agrees that all information relating to SOAC included in the Company Information Circular must be in a form and content reasonably satisfactory to SOAC. The Company shall provide SOAC with a final copy of the Company Information Circular prior to its delivery to the Company Shareholders.

(v) Each Party shall promptly notify the other Party if it becomes aware that the Company Information Circular contains a Misrepresentation, or otherwise requires an amendment or supplement. The Parties

shall reasonably cooperate in the preparation of any such amendment or supplement as required or appropriate, and the Company shall promptly deliver or otherwise disseminate any such amendment or supplement to the Company Shareholders as required by the Court or applicable Law.

(d) The Final Order. The Company shall take all steps necessary or reasonably desirable to submit the Arrangement to the Court and diligently pursue an application for the Final Order pursuant to Part 9, Division 5 of the BCBCA, as soon as reasonably practicable, but in any event not later than five (5) Business Days after the Company Required Approval is obtained for the Company Arrangement Resolution as provided for in the Interim Order, unless otherwise agreed by the Company and SOAC.

(e) Court Proceedings.

(i) In connection with all Court proceedings relating to obtaining the Interim Order and the Final Order, the Company shall: (A) diligently pursue (and SOAC shall reasonably cooperate with the Company in diligently pursuing), the Interim Order and the Final Order; (B) provide SOAC and its Representatives with a reasonable opportunity to review and comment upon drafts of all materials to be filed with the Court in connection with the Arrangement, and accept the reasonable comments of SOAC and its Representatives, and all information relating to SOAC included in such materials must be in a form and content reasonably satisfactory to SOAC; (C) provide on a timely basis copies of any response to petition, evidence or other documents served on the Company or its legal counsel in respect of the application for the Interim Order or the Final Order or any appeal from them, and any notice, written or oral, indicating the intention of any person to appeal, or oppose the granting of, the Interim Order or the Final Order; (D) ensure that all material filed with the Court in connection with the Arrangement is consistent with this Agreement and the Plan of Arrangement; (E) not file any material with the Court that result in an increase or variation in the form of the Exchange Consideration or other modification or amendment to such materials that expands or increases SOAC's obligations, or diminishes or limits SOAC's rights, set forth in any such materials or under this Agreement, the Arrangement, the Plan of Arrangement or the Transaction Support Agreements; (F) subject to this Agreement, oppose any proposal from any person that the Final Order contain any provision inconsistent with the Plan of Arrangement or this Agreement, and if at any time after the issuance of the Final Order and prior to the Effective Time, the Company is required by the terms of the Final Order or by applicable Law to return to Court with respect to the Final Order, it will do so only after notice to, and in good faith consultation with, SOAC; and (G) not object to legal counsel to SOAC making such submissions on the hearing of the motion for the Interim Order and the application for the Final Order as such counsel considers appropriate, provided SOAC advises the Company of the nature of any such submissions prior to the hearing and such submissions are consistent with this Agreement and the Plan of Arrangement.

(ii) Subject to the terms of this Agreement, SOAC will reasonably cooperate with, and assist the Company in, seeking the Interim Order and the Final Order, including by providing the Company on a timely basis any material information reasonably required or reasonably requested to be supplied by SOAC in connection therewith.

Section 2.2 Closing Transactions. On the terms and subject to the conditions set forth in this Agreement and the Plan of Arrangement, the following transactions shall occur:

(a) SOAC Continuance. Prior to the Effective Time, SOAC shall cause the SOAC Continuance to occur in accordance with Part 9, Division 8 of the BCBCA and Part XII of the Cayman Islands Companies Act (As Revised). In connection with the SOAC Continuance, (i) the notice of articles, substantially in the form attached hereto as Exhibit G (the "SOAC Notice of Articles"), shall become the notice of articles of SOAC, (ii) the articles, substantially in the form attached hereto as Exhibit H (the "SOAC Articles"), shall become the articles of SOAC, and (iii) each SOAC Warrant that is outstanding immediately prior to the SOAC Continuance shall, from and after the SOAC Continuance, represent the right to purchase one SOAC Common Share at an exercise price of $11.50 per share, subject to adjustment, on the terms and subject to the conditions set forth in the Warrant Agreement. Effective upon the SOAC Continuance (w) the identifying name of the SOAC Class A Shares and SOAC Class B Shares shall be changed to SOAC Common Shares, (x) the SOAC Class A Shares and the SOAC Class B Shares shall have the rights and restrictions attached to the SOAC Common Shares, as described in the SOAC Articles, (y) the Earnout Shares and the Vesting Sponsor Shares shall be created and authorized, and (z) SOAC's name shall be changed to TMC the metals company Inc.

(b) Preferred Share Conversion. Immediately prior to the Effective Time, all Company Preferred Shares shall automatically be converted into Company Common Shares in accordance with the terms of Section 28.6 of the Company's articles (the "Preferred Share Conversion").

(c) Convertible Debenture Conversion. Not later than immediately prior to the Effective Time, all Company Convertible Debentures shall by election of the holders thereof or automatically in accordance with their terms be converted into Company Common Shares (the "Convertible Debenture Conversion").

(d) Alleseas Observer Letter. At the Effective Time, SOAC shall deliver to Allseas a letter providing it with the rights set forth in the Allseas Observer Letter.

Section 2.3 Closing of the Transactions Contemplated by this Agreement. At the Effective Time, the Share Exchange and Amalgamation shall occur on the terms and subject to the conditions set forth in the Plan of Arrangement. The closing of the transactions contemplated by this Agreement (the "Closing") shall take place electronically by exchange of the closing deliverables by the means provided in Section 9.11 as promptly as reasonably practicable, but in no event later than the third (3rd) Business Day, following the satisfaction (or, to the extent permitted by applicable Law, waiver) of the conditions set forth in Article 6 (other than those conditions that by their nature are to be satisfied at the Closing, but subject to satisfaction or waiver of such conditions) (the "Closing Date") or at such other place, date and/or time as SOAC and the Company may agree in writing.

Section 2.4 Allocation Schedule.

(a) No later than five (5) Business Days prior to the Closing Date, the Company shall deliver to SOAC (and SOAC shall thereafter deliver to the Exchange Agent) an allocation schedule (the "Allocation Schedule") setting forth (i) the number of Company Shares held by each Company Shareholder after giving effect to the Preferred Share Conversion and the Convertible Debenture Conversion and the number of Company Common Shares subject to each Company Option held by each holder thereof and the exercise price thereof, (ii) the number of Company Common Shares underlying the Allseas Warrant and the number of SOAC Common Shares into which the Allseas Warrant shall be exercisable after the Effective Time as per the terms of the Allseas Warrant, (iii) (x) the number of SOAC Common Shares that will be subject to each Rollover Option, which shall be determined by multiplying the number of Company Common Shares subject to the corresponding Company Option immediately prior to the Effective Time by the Per Share Consideration and rounding the resulting number down to the nearest whole number of SOAC Common Shares, (y) the exercise price thereof at the Effective Time, which shall be determined by dividing the per share exercise price for the number of Company Common Shares subject to the corresponding Company Option in effect immediately prior to the Effective Time by the Per Share Consideration, and rounding the resulting exercise price up to the nearest whole cent, and (z) the portion of the Company Earnout Shares to be allocated to each holder of Rollover Options upon exercise of such Rollover Options pursuant to and in accordance with Section 2.8, which shall be allocated on a *pro rata* basis which shall be determined by dividing the aggregate number of Company Common Shares subject to the corresponding Company Options immediately prior to the Effective Time by the number of Company Fully Diluted Shares, (iv) the portion of the SOAC Common Shares Consideration allocated to each Company Shareholder, determined by multiplying the number of Company Shares held by such Company Shareholder immediately prior to the Effective Time by the Per Share Consideration, (v) the portion of the Company Earnout Shares to be allocated to each Company Shareholder pursuant to and in accordance with Section 2.8, which shall be allocated on a *pro rata* basis which shall be determined by dividing the aggregate number of Company Shares held by such Company Shareholder by the number of Company Fully Diluted Shares, (vi) the Company's good faith calculation of Net Group Company Cash, together with reasonable supporting detail as to such calculation, and (vii) a certification, duly executed by an authorized officer of the Company, that the information delivered pursuant to clauses (i), (ii), (iii), (iv), (v) and (vi) is, and will be as of immediately prior to the Effective Time, true and correct in all respects and in accordance with the last sentence of this Section 2.4. The Company will review any comments to the Allocation Schedule provided by SOAC or any of its Representatives and consider and incorporate in good faith any reasonable comments proposed by SOAC or any of its Representatives. Notwithstanding the foregoing or anything to the contrary herein, (1) the aggregate number of SOAC Common Shares that each Company Shareholder will have a right to receive under the Plan of Arrangement and the number of shares underlying the Allseas Warrants as of the Effective Time will be rounded down to the nearest whole share, (2) in no event shall the aggregate number of SOAC Common Shares set forth on the Allocation Schedule that are allocated in respect of Company Shares and Company Equity Awards or that are issuable to the Company Equityholders hereunder exceed the SOAC Common Shares Consideration and (3) in no event shall the Allocation

Schedule (or the calculations or determinations therein) breach, as applicable, any applicable Law, the Governing Documents of the Company, the Company Equity Plan or any other Contract to which the Company is a party or bound.

(b) SOAC, the Exchange Agent and their respective Affiliates and Representatives shall be entitled to rely, without any independent investigation or inquiry, on the names, amounts, and other information set forth in the Allocation Schedule. None of SOAC, the Exchange Agent and their respective Affiliates or Representatives shall have any Liability to any Company Shareholder or any of its Affiliates for relying on the Allocation Schedule. Except with SOAC's written consent, the Allocation Schedule may not be modified after delivery to SOAC except pursuant to a written instruction from the Company, with certification from an authorized representative of the Company that such modification is true and correct. SOAC, the Exchange Agent and their respective Affiliates and Representatives shall be entitled to rely, without any independent investigation or inquiry, on such modified Allocation Schedule.

Section 2.5 Treatment of Company Equity Awards.

(a) At the Effective Time, on the terms and subject to the conditions set forth in the Plan of Arrangement, without any action of any Party or any other Person (but subject to Section 2.5(b)), SOAC shall adopt and assume the Company Equity Plan (the "Assumed Plan"). Each Company Option outstanding immediately prior to the Effective Time shall cease to represent the right to purchase Company Common Shares and shall become an option to purchase a number of SOAC Common Shares equal to the number of Company Common Shares subject to such Company Option immediately prior to the Effective Time multiplied by the Per Share Consideration (rounded down to the nearest whole share) under the Assumed Plan (each, a "Rollover Option") at an exercise price per share equal to the exercise price per share of such Company Option immediately prior to the Effective Time divided by the Per Share Consideration (rounded up to the nearest whole cent), and the portion of the Company Earnout Shares to be allocated to each such Rollover Option upon exercise of such Rollover Option pursuant to and in accordance with Section 2.8 and the Allocation Schedule. Each Rollover Option shall be subject to the same terms and conditions (including applicable vesting, expiration and forfeiture provisions) that applied to the corresponding Company Option immediately prior to the Effective Time, subject to the adjustments required by this Section 2.5(a) after giving effect to the Arrangement (or Alternative Transaction). Such assumption and conversion shall occur in a manner intended to comply with the requirements of Section 409A of the Code and subsection 7(1.4) of the Tax Act.

(b) Prior to the Closing, the Company and SOAC shall take, or cause to be taken, all necessary or appropriate actions under or in connection with the Company Equity Plan (and the underlying grant, award or similar agreements), including to reserve for issuance a sufficient number of SOAC Common Shares and Earnout Shares for delivery upon exercise of the Rollover Options under the Assumed Plan, or otherwise to give effect to the provisions of this Section 2.5 no less than five (5) Business Days prior to Closing, the Company and SOAC shall each provide to the other copies of all such necessary or appropriate actions and a reasonable opportunity to provide comments, which comments will be considered in good faith.

Section 2.6 Exchange Agent.

(a) As promptly as reasonably practicable following the date of this Agreement, but in no event later than ten (10) Business Days prior to the Closing Date, SOAC shall appoint an exchange agent reasonably acceptable (such acceptance, not to be unreasonably withheld, conditioned or delayed) to the Company (the "Exchange Agent") and enter into an exchange agent agreement with the Exchange Agent for the purpose of (i) exchanging certificates, if any, representing the Company Common Shares ("Certificates"), and each Company Share held in book-entry form on the securities registry of the Company immediately prior to the Effective Time, in either case, for the portion of the SOAC Common Shares Consideration issuable in respect of such Company Shares in accordance with the Allocation Schedule and on the terms and subject to the conditions set forth in this Agreement and the Plan of Arrangement and (ii) depositing with the Exchange Agent, for the benefit of the Company in accordance with Section 2.8, the Company Earnout Shares.

(b) At least three (3) Business Days prior to the Closing Date, the Company shall mail or otherwise deliver, or shall cause to be mailed or otherwise delivered, a Letter of Transmittal to the Company Shareholders.

(c) As soon as practicable following the SOAC Continuance and prior to the Effective Time, SOAC shall deposit, or cause to be deposited, with the Exchange Agent, for the benefit of (i) the Company Shareholders

and for exchange in accordance with this Section 2.6 through the Exchange Agent and (ii) the Company Shareholders and the Sponsor in accordance with Section 2.8, evidence of the Exchange Consideration in book-entry form.

(d) At the Effective Time, on the terms and subject to the conditions set forth in this Agreement and the Plan of Arrangement, each Company Shareholder shall be entitled to receive the portion of the Exchange Consideration to which he, she or it is entitled on the date provided in Section 2.6(e) upon (i) surrender of a Certificate (or affidavit of loss in lieu thereof in the form required by SOAC, the Company and the Exchange Agent) to the Exchange Agent or (ii) in the case of Company Common Shares held in book-entry form, a properly completed and duly executed Letter of Transmittal (including, for the avoidance of doubt, any documents or agreements required by SOAC, the Company and the Exchange Agent), to the Exchange Agent.

(e) If a properly completed and duly executed Letter of Transmittal together with, as applicable, any Certificates (or affidavit of loss in lieu thereof in the form required by SOAC, the Company and the Exchange Agent) are delivered to the Exchange Agent in accordance with Section 2.6(d) (i) at least two (2) Business Days prior to the Closing Date, then SOAC and the Company shall take all necessary actions to cause the applicable portion of the Exchange Consideration to be issued to the applicable Company Shareholder in book-entry form on the Closing Date in accordance with the Allocation Schedule, or (ii) less than two (2) Business Days prior to the Closing Date, then SOAC and the Company shall take all necessary actions to cause the applicable portion of the Exchange Consideration to be issued to the Company Shareholder in book-entry form in accordance with the Allocation Schedule within two (2) Business Days after such delivery.

(f) If any portion of the Exchange Consideration is to be issued to a Person other than the Company Shareholder in whose name the surrendered Certificate or the transferred Company Share in book-entry form is registered, it shall be a condition to the issuance of the applicable portion of the Exchange Consideration that (i) either such Certificate shall be properly endorsed or shall otherwise be in proper form for transfer or such Company Share in book-entry form shall be properly transferred and (ii) the Person requesting such consideration pay to the Exchange Agent any transfer Taxes required as a result of such consideration being issued to a Person other than the registered holder of such Certificate or Company Share in book-entry form or establish to the satisfaction of the Exchange Agent that such transfer Taxes have been paid or are not payable.

(g) No interest will be paid or accrued on the Exchange Consideration (or any portion thereof). From and after the Effective Time, until surrendered or transferred, as applicable, in accordance with this Section 2.6, each Company Share shall solely represent the right to receive a portion of the Exchange Consideration to which such Company Share is entitled to receive in accordance with the Allocation Schedule.

(h) Any portion of the aggregate Exchange Consideration that remains unclaimed by the Company Shareholders six (6) years following the Closing Date shall be delivered to SOAC or as otherwise instructed by SOAC, and any right or claim to payment under the Plan of Arrangement that remains outstanding six (6) years following the Closing Date shall cease to represent a right or claim of any kind or nature and the right of the Company Shareholders to receive the applicable portion of the aggregate Exchange Consideration in accordance with the Plan of Arrangement shall terminate and be deemed to be surrendered and forfeited to SOAC, for no consideration.

Section 2.7 Withholding. SOAC, the Group Companies and the Exchange Agent shall be entitled to deduct and withhold (or cause to be deducted and withheld) with respect to any consideration payable pursuant to this Agreement such amounts as are required to be deducted and withheld under applicable Tax Law. Any amounts so withheld shall be timely remitted to the applicable Governmental Entity, and shall be treated for all purposes of this Agreement as having been paid to the Person in respect of which such deduction and withholding was made. Each of SOAC and the Exchange Agent, as applicable, is hereby authorized to sell or otherwise dispose of, on behalf of such Person, such portion of the Exchange Consideration as is necessary to provide sufficient funds to SOAC or the Exchange Agent, as the case may be, to enable it to comply with such deduction and withholding requirement and SOAC or the Exchange Agent shall use commercially reasonable efforts to notify such Person thereof and remit the applicable portion of the net proceeds of such sale to the appropriate Governmental Entity and, if applicable, any portion of such net proceeds that is not required to be so remitted shall be paid to such Person. The Parties shall cooperate in good faith to eliminate or reduce any such deduction or withholding (including through the request and provision of any statements, forms or other documents to reduce or eliminate any such deduction or withholding).

Section 2.8 Earnout Shares.

(a) At the Effective Time, (i) on the terms and subject to the conditions set forth in this Agreement and the Plan of Arrangement, each Company Shareholder shall be entitled to receive the portion of the Company Earnout Shares to which he, she or it is entitled in accordance with the Allocation Schedule and Section 2.6, and (ii) on the terms and subject to the conditions set forth in this Agreement and the Plan of Arrangement, each holder of Rollover Options shall be entitled to receive the portion of the Company Earnout Shares upon exercise thereof to which he, she or it is entitled in accordance with the Allocation Schedule and Section 2.6.

(b) The SOAC Articles shall provide, with respect to the Earnout Shares that:

(i) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the SOAC Common Shares trade for a price that is greater than or equal to $15.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $15.00 per SOAC Common Share, then all of the Class A Special Shares of the Company shall automatically be converted into SOAC Common Shares;

(ii) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $25.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $25.00 per SOAC Common Share, then all of the Class B Special Shares of the Company shall automatically be converted into SOAC Common Shares;

(iii) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $35.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $35.00 per SOAC Common Share, then all of the Class C Special Shares of the Company shall automatically be converted into SOAC Common Shares;

(iv) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $50.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $50.00 per SOAC Common Share, then all of the Class D Special Shares of the Company and all of the Sponsor Earnout Shares shall automatically be converted into SOAC Common Shares;

(v) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $75.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $75.00 per SOAC Common Share, then all of the Class E Special Shares of the Company shall automatically be converted into SOAC Common Shares;

(vi) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $100.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $100.00 per SOAC Common Share, then all of the Class F Special Shares of the Company shall automatically be converted into SOAC Common Shares;

(vii) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $150.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $150.00 per SOAC Common Share, then all of the Class G Special Shares of the Company shall automatically be converted into SOAC Common Shares;

(viii) if (y) on any twenty (20) Trading Days within any thirty (30) Trading Day period the SOAC Common Shares trade for a price that is greater than or equal to $200.00 or (z) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $200.00 per SOAC Common Share, then all of the Class H Special Shares of the Company shall automatically be converted into SOAC Common Shares; and

(ix) if (y) there occurs any transaction resulting in a Change of Control and the applicable valuation of the SOAC Common Shares is less than the respective dollar values set forth in clauses (i) — (viii) above, or (z) any Earnout Share is outstanding on the fifteenth (15th) anniversary of the Closing Date (the "Earnout Period"), then each outstanding Earnout Share shall be redeemable by the Company, without any action or consent on the part of the Company Shareholders or the Sponsor and as set forth in the SOAC Articles.

(c) SOAC shall take such actions as are reasonably requested by any Company Shareholders, holders of Rollover Options following exercise thereof or the Sponsor, as applicable, to evidence the issuances to or ownership by him, her or it of SOAC Common Shares pursuant to this Section 2.8, including through the provision of an updated securities registry showing such issuances (as certified by an officer of SOAC responsible for maintaining such registry or the applicable registrar or transfer agent of SOAC).

(d) In the event SOAC shall at any time during the Earnout Period effect a subdivision or consolidation of the outstanding SOAC Common Shares into a greater or lesser number of SOAC Common Shares, then (i) the Earnout Shares shall be subdivided or consolidated in the same manner, and (ii) the dollar values set forth in Section 2.8(b)(i) through (viii) above shall be appropriately amended to provide to such Company Shareholders and Sponsor the same economic effect as contemplated by this Agreement prior to such event.

(e) During the Earnout Period, SOAC shall take all reasonable efforts for SOAC to remain listed as a public company on, and for the SOAC Common Shares (including, for the avoidance of doubt, the SOAC Common Shares issuable upon conversion of the Earnout Shares in accordance with Section 2.8) to be tradable over, the NYSE; provided, however, the foregoing shall not limit SOAC from consummating a Change of Control or entering into a Contract that contemplates a Change of Control. Subject to the terms hereof, upon the consummation of any Change of Control during the Earnout Period, other than as set forth in Section 2.8(b) above, SOAC shall have no further obligations pursuant to this Section 2.8(e).

(f) From and after the Closing, unless and until such Earnout Shares convert into SOAC Common Shares in accordance with their terms and Section 2.8(b), a holder of Earnout Shares shall not transfer, sell, pledge or otherwise dispose or hypothecate any of his, her or its Earnout Shares. Any share certificates representing the Earnout Shares shall contain a legend relating to transfer restrictions imposed by this Agreement and the risk of redemption associated with such Earnout Shares.

Section 2.9 Allseas Warrant. At the Effective Time, on the terms of and subject to the conditions set forth in the Plan of Arrangement, the Allseas Warrant shall be assumed by SOAC and become exercisable for such number of SOAC Common Shares set forth in the Allocation Schedule on the same terms and conditions as the Allseas Warrant.

ARTICLE 3
REPRESENTATIONS AND WARRANTIES RELATING TO THE GROUP COMPANIES

Subject to Section 9.8, except as set forth on the Company Disclosure Schedules, the Company hereby represents and warrants to the SOAC Parties as follows:

Section 3.1 Organization and Qualification.

(a) Each Group Company is a corporation, limited liability company or other applicable business entity duly organized, incorporated or formed, as applicable, validly existing and in good standing (or the equivalent thereof, if applicable, in each case, with respect to the jurisdictions that recognize the concept of good standing or any equivalent thereof) under the Laws of its jurisdiction of formation or organization (as applicable). Section 3.1(a) of the Company Disclosure Schedules sets forth the jurisdiction of organization, incorporation or formation (as applicable) for each Group Company. Each Group Company has the requisite corporate, limited liability company or other applicable business entity power and authority to own, lease and operate its properties and to carry on its businesses as presently conducted, except where the failure to have such power or authority would not have a Company Material Adverse Effect.

(b) True and complete copies of the Governing Documents of each Group Company have been made available to SOAC, in each case, as amended and in effect as of the date of this Agreement. The Governing Documents of each Group Company are in full force and effect, and no Group Company is in breach or violation of any provision set forth in its Governing Documents.

(c) Each Group Company is duly qualified or licensed to transact business and is in good standing (or the equivalent thereof, if applicable, in each case, with respect to the jurisdictions that recognize the concept of good standing or any equivalent thereof) in each jurisdiction in which the property and assets owned, leased or operated by it, or the nature of the business conducted by it, makes such qualification or licensing necessary, except where the failure to be so duly qualified or licensed and in good standing would not have a Company Material Adverse Effect.

Section 3.2 Capitalization of the Group Companies.

(a) Section 3.2(a) of the Company Disclosure Schedules sets forth a true and complete statement as of the date of this Agreement of (i) the number and class or series (as applicable) of all of the Equity Securities of the Company issued and outstanding, (ii) the identity of the Persons that are the registered holders thereof and (iii) with respect to each Company Option, (A) the date of grant, (B) any applicable exercise (or similar) price, (C) any applicable expiration (or similar) date, (D) any applicable vesting schedule (including acceleration provisions) and (E) whether such Company Option is an Incentive Stock Option. All of the Equity Securities of the Company have been duly authorized and validly issued. All of the outstanding Company Shares are fully paid and non-assessable, and each Company Option outstanding immediately prior to the Effective Time will be an "in the money" Company Option (*i.e.*, the value of the Adjusted Equity Value allocated to each Company Option is in excess of the exercise (or similar) price applicable to such Company Option).

(b) The Equity Securities of the Company (i) were not issued in violation of the Governing Documents of the Company or any other Contract to which the Company is party or bound, (ii) were not issued in violation of any preemptive rights, call option, right of first refusal or first offer, subscription rights, transfer restrictions or similar rights of any Person, (iii) have been offered, sold and issued in compliance with applicable Law, including Securities Laws and (iv) are free and clear of all Liens (other than transfer restrictions under the Governing Documents of the Company and applicable Securities Law). Except for the Company Options set forth on Section 3.2(a) of the Company Disclosure Schedules and those either permitted by Section 5.1(b) or issued, granted or entered into in accordance with Section 5.1(b), the Company has no outstanding (x) equity appreciation, phantom equity or profit participation rights or (y) options, restricted shares, restricted share units, phantom shares, warrants, purchase rights, subscription rights, conversion rights, exchange rights, calls, puts, rights of first refusal or first offer or other Contracts that could require the Company to issue, sell or otherwise cause to become outstanding or to acquire, repurchase or redeem any Equity Securities or securities convertible into or exchangeable for Equity Securities of the Company. There are no voting trusts, proxies or other Contracts with respect to the voting or transfer of the Company's Equity Securities.

(c) Section 3.2(c) of the Company Disclosure Schedules sets forth a true and complete statement of (i) the number and class or series (as applicable) of all of the Equity Securities of each Subsidiary of the Company issued and outstanding and (ii) the identity of the Persons that are the record and beneficial owners thereof. There are no outstanding (A) equity appreciation, phantom equity or profit participation rights or (B) options, restricted stock, restricted stock units, phantom stock, warrants, purchase rights, subscription rights, conversion rights, exchange rights, calls, puts, rights of first refusal or first offer or other Contracts that could require any Subsidiary of the Company to issue, sell or otherwise cause to become outstanding or to acquire, repurchase or redeem any Equity Securities or securities convertible into or exchangeable for Equity Securities of the Subsidiaries of the Company. There are no voting trusts, proxies or other Contracts to which any Group Company is a party with respect to the voting or transfer of any Equity Securities of any Subsidiary of the Company.

(d) None of the Group Companies owns or holds (of record, beneficially, legally or otherwise), directly or indirectly, any Equity Securities in any other Person or the right to acquire any such Equity Security, and none of the Group Companies are a partner or member of any partnership, limited liability company or joint venture.

(e) Section 3.2(e) of the Company Disclosure Schedules sets forth a list of all Indebtedness of the Group Companies as of the date of this Agreement, including the principal amount of such Indebtedness, the outstanding balance as of the date of this Agreement, and the debtor and the creditor thereof.

(f) Section 3.2(f) of the Company Disclosure Schedules sets forth a list of all Change of Control Payments of the Group Companies.

Section 3.3 Authority. The Company has the requisite corporate, limited liability company or other similar power and authority to execute and deliver this Agreement and each Ancillary Document to which it is or will be a party, to perform its obligations hereunder and thereunder and to consummate the transactions contemplated hereby and thereby. Subject to the receipt of the Company Required Approval of the Company Arrangement Resolution, the execution and delivery of this Agreement, the Ancillary Documents to which the Company is or will be a party and the consummation of the transactions contemplated hereby and thereby have been (or, in the case of any Ancillary Document entered into after the date of this Agreement, will be upon execution thereof) duly authorized by all necessary corporate (or other similar) action on the part of the Company. This Agreement and each Ancillary Document to which the Company is or will be a party has been or will be, upon execution thereof, as applicable, duly and validly executed and delivered by the Company and constitutes or will constitute, upon execution and delivery thereof, as applicable, a valid, legal and binding agreement of the Company (assuming that this Agreement and the Ancillary Documents to which the Company is or will be a party are or will be upon execution thereof, as applicable, duly authorized, executed and delivered by the other Persons party thereto), enforceable against the Company in accordance with its terms (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity).

Section 3.4 Financial Statements; Undisclosed Liabilities.

(a) The Company has made available to SOAC a true and complete copy of (i) the audited consolidated balance sheet of the Group Companies as of December 31, 2018 and December 31, 2019 and the related audited consolidated statements of loss and comprehensive loss, cash flows and changes of equity of the Group Companies for the years then ended, together with the auditor's reports thereon (the "Audited Financial Statements"), and (ii) the unaudited consolidated balance sheet of the Group Companies as of December 31, 2020 and the related unaudited consolidated statements of loss and comprehensive loss, cash flows and changes of equity for the year ended December 31, 2020 (such December 31, 2020 balance sheet of the Group Companies, the "Latest Balance Sheet") (the "Interim Financial Statements" and, together with the Audited Financial Statements, the "Financial Statements"), which are attached as Section 3.4(a) of the Company Disclosure Schedules. The Audited Financial Statements (including the notes thereto) (A) were prepared in accordance with IFRS applied on a consistent basis throughout the periods indicated (except as may be specifically indicated in the notes thereto), and (B) fairly presents, in all material respects, the financial position, results of operations, cash flows and changes of equity of the Group Companies as at the date thereof and for the period indicated therein. The Interim Financial Statements (including the notes thereto) (A) were prepared in accordance with GAAP applied on a consistent basis throughout the periods indicated (except as may be specifically indicated in the notes thereto), (B) fairly presents, in all material respects, the financial position, results of operations, cash flows and changes of equity of the Group Companies as at the date thereof and for the period indicated therein and (C) comply in all material respects with the applicable accounting requirements and with the rules and regulations of the SEC, the Exchange Act and the Securities Act in effect as of the date of the Agreement (including Regulation S-X or Regulation S-K, as applicable).

(b) Each of the audited consolidated balance sheets of the Group Companies as of December 31, 2019 and December 31, 2020 and the related audited consolidated statements of loss and comprehensive loss, cash flows and changes of equity of the Group Companies for the years then ended, together with the auditor's reports thereon, and each of the other financial statements or similar reports required to be included in the Registration Statement/Proxy Statement or any other filings to be made by the Group Companies with the SEC in connection with the transactions contemplated in this Agreement or any other Ancillary Document (the "Closing Company Financial Statements"), when delivered following the date of this Agreement in accordance with Section 5.16, (i) will be prepared in accordance with GAAP applied on a consistent basis throughout the periods indicated (except as may be indicated in notes thereto), (ii) will fairly present, in all material respects, the financial position, results of operations, cash flows and changes of equity of the Group Companies as at the date thereof and for the period indicated therein (except as otherwise specifically noted therein), (iii) will be prepared in accordance with the standards of the PCAOB and contain an unqualified report of the Company's auditors and (iv) will comply in

all material respects with the applicable accounting requirements and with the rules and regulations of the SEC, the Exchange Act and the Securities Act in effect as of the date of such delivery (including Regulation S-X or Regulation S-K, as applicable).

(c) Except (i) as set forth on the face of the Latest Balance Sheet, (ii) for Liabilities incurred in the ordinary course of business since the date of the Latest Balance Sheet (none of which are Liabilities directly or indirectly related to a breach of Contract, breach of warranty, tort, infringement, misappropriation, Proceeding or violation of, or non-compliance with, Law), (iii) for Liabilities incurred in connection with the negotiation, preparation or execution of this Agreement or any Ancillary Documents, the performance by the Company of its covenants or agreements in this Agreement or any Ancillary Document to which it is or will be a party or the consummation of the transactions contemplated hereby or thereby and (iv) for Liabilities that are not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole, no Group Company has any Liabilities.

(d) The Group Companies have established and maintain systems of internal accounting controls that are designed to provide, in all material respects, reasonable assurance that (i) all transactions are executed in accordance with management's authorization and (ii) all transactions are recorded as necessary to permit preparation of proper and accurate financial statements in accordance with GAAP and to maintain accountability for the Group Companies' assets. The Group Companies maintain and, for all periods covered by the Financial Statements, have maintained books and records of the Group Companies in the ordinary course of business that are accurate and complete and reflect the revenues, expenses, assets and liabilities of the Group Companies in all material respects.

(e) Since the Reference Date, no Group Company has received any written complaint, allegation, assertion or claim that there is (i) "significant deficiency" in the internal controls over financial reporting of the Group Companies to the Company's knowledge, (ii) a "material weakness" in the internal controls over financial reporting of the Group Companies to the Company's knowledge or (iii) fraud, whether or not material, that involves management or other employees of the Group Companies who have a significant role in the internal controls over financial reporting of the Group Companies.

Section 3.5 Consents and Requisite Governmental Approvals; No Violations.

(a) No consent, approval or authorization of, or designation, declaration or filing with, any Governmental Entity is required on the part of the Company with respect to the Company's execution, delivery or performance of its obligations under this Agreement or the Ancillary Documents to which the Company is or will be party or the consummation of the transactions contemplated hereby or thereby, except for (i) the Investment Canada Act Approval (if required); (ii) the filing with the SEC of (A) the Registration Statement/Proxy Statement and the declaration of the effectiveness thereof by the SEC and (B) such reports under Section 13(a) or 15(d) of the Exchange Act as may be required in connection with this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby, (iii) the filing of any documents required by the Final Order, the Interim Order and filings required pursuant to the Plan of Arrangement or (iv) any other consents, approvals, authorizations, designations, declarations, waivers or filings, the absence of which would not have a Company Material Adverse Effect.

(b) None of the execution or delivery by the Company of this Agreement or any Ancillary Documents to which it is or will be a party, the performance by the Company of its obligations hereunder or thereunder or the consummation of the transactions contemplated hereby or thereby will, directly or indirectly (with or without due notice or lapse of time or both) (i) result in a breach of any provision of the Company's Governing Documents, (ii) result in a violation or breach of, or constitute a default or give rise to any right of termination, Consent, cancellation, amendment, modification, suspension, revocation or acceleration under, any of the terms, conditions or provisions of (A) any Contract to which any Group Company is a party or (B) any Material Permits, (iii) violate, or constitute a breach under, any Order or applicable Law to which any Group Company or any of its properties or assets are bound or (iv) result in the creation of any Lien upon any of the assets or properties (other than any Permitted Liens) or Equity Securities of any Group Company, except, in the case of any of clauses (ii) through (iv) above, as would not have a Company Material Adverse Effect.

Section 3.6 Permits Each of the Group Companies has all Permits (the "Material Permits") that are required to own, lease or operate its properties and assets and to conduct its business as currently conducted, except where the failure to hold the same would not result in a Company Material Adverse Effect. Except as is not and

would not reasonably be expected to be material to the Group Companies, taken as a whole, (i) each Material Permit is in full force and effect in accordance with its terms and (ii) no written notice of revocation, cancellation or termination of any Material Permit has been received by any Group Company.

Section 3.7 Material Contracts.

(a) Section 3.7(a) of the Company Disclosure Schedules sets forth a list of the following Contracts to which a Group Company is, as of the date of this Agreement, a party (each Contract required to be set forth on Section 3.7(a) of the Company Disclosure Schedules, together with each Contract entered into after the date of this Agreement that would be required to be set forth on Section 3.7(a) of the Company Disclosure Schedules if entered into prior to the execution and delivery of this Agreement, collectively, the "Material Contracts"):

(i) the Material Exploration Contracts;

(ii) any Contract relating to Indebtedness of any Group Company or to the placing of a Lien (other than a Permitted Lien) on any material assets or properties of any Group Company;

(iii) any Contract under which any Group Company is lessee of or holds or operates, in each case, any tangible property (other than real property), owned by any other Person, except for any lease or agreement under which the aggregate annual rental payments do not exceed $100,000;

(iv) any Contract under which any Group Company is lessor of or permits any third party to hold or operate, in each case, any tangible property (other than real property), owned or controlled by such Group Company, except for any lease or agreement under which the aggregate annual rental payments do not exceed $250,000;

(v) any (A) material joint venture, profit-sharing, partnership, collaboration, co-promotion, commercialization, research and development, or sponsorship Contract or (B) other Contract with respect to material Company Licensed Intellectual Property (other than any Contract of the type described in clauses (A) through (C) of Section 3.13(c));

(vi) any Contract that (A) limits or purports to limit, in any material respect, the freedom of any Group Company to engage or compete in any line of business or with any Person or in any area or that would so limit or purport to limit, in any material respect, the operations of SOAC or any of its Affiliates after the Closing, (B) contains any exclusivity, "most favored nation" or similar provisions, obligations or restrictions not in favor of a Group Company or (C) contains any other provisions restricting or purporting to restrict the ability of any Group Company to sell, manufacture, develop, commercialize, test or research products, directly or indirectly through third parties, or to solicit any potential employee or customer in any material respect or that would so limit or purports to limit, in any material respect, SOAC or any of its Affiliates after the Closing;

(vii) any Contract requiring any future capital commitment or capital expenditure (or series of capital expenditures) by any Group Company in an amount in excess of (A) $1,000,000 annually or (B) $2,000,000 over the life of the agreement;

(viii) any Contract requiring any Group Company to guarantee the Liabilities of any Person (other than the Company or a Subsidiary) or pursuant to which any Person (other than the Company or a Subsidiary) has guaranteed the Liabilities of a Group Company, in each case in excess of $200,000;

(ix) any Contract under which any Group Company has, directly or indirectly, made or agreed to make any loan, advance, or assignment of payment to any Person (other than the Company or a Subsidiary) or made any capital contribution to, or other investment in, any Person (other than the Company or a Subsidiary);

(x) any Contract required to be disclosed on Section 3.19 of the Company Disclosure Schedules;

(xi) any Contract with any Person (A) pursuant to which any Group Company (or SOAC or any of its Affiliates after the Closing) may be required to pay milestones, royalties or other contingent payments based on any research, exploration, testing, development, collection, regulatory filings or approval, sale, distribution, commercial manufacture or other similar occurrences, developments, activities or events or (B) under which any

Group Company grants to any Person any right of first refusal, right of first negotiation, option to purchase, option to license or any other similar rights with respect to any material assets or properties of any Group Company or any Intellectual Property Rights;

(xii) any Contract (A) governing the terms of, or otherwise related to, the employment, engagement or services of any current director, manager, officer, employee, individual independent contractor or other service provider of a Group Company whose annual salary (or, in the case of an independent contractor, annual compensation) is in excess of $200,000, or (B) providing for any Change of Control Payment of the type described in clause (a) of the definition thereof;

(xiii) any Contract for the disposition of any portion of the assets or business of any Group Company or for the acquisition by any Group Company of the assets or business of any other Person (other than acquisitions or dispositions made in the ordinary course of business), or under which any Group Company has any continuing obligation with respect to an "earn-out", contingent purchase price or other contingent or deferred payment obligation;

(xiv) any settlement, conciliation or similar Contract (A) the performance of which would be reasonably likely to involve any payments after the date of this Agreement, (B) with a Governmental Entity or (C) that imposes or is reasonably likely to impose, at any time in the future, any material, non-monetary obligations on any Group Company (or SOAC or any of its Affiliates after the Closing);

(xv) any Contract that provides for a "take-or-pay" clause or any similar prepayment obligations or any offtake or quantity commitments on any Group Company (or SOAC or any of its Affiliates after the Closing); and

(xvi) any other Contract the performance of which requires either (A) annual payments to or from any Group Company in excess of $2,000,000 or (B) aggregate payments to or from any Group Company in excess of $5,000,000 over the life of the agreement and, in each case, that is not terminable by the applicable Group Company without penalty upon less than thirty (30) days' prior written notice.

(b) (i) Each Material Contract is valid and binding on the applicable Group Company and, to the Company's knowledge, the counterparties thereto, and is in full force and effect and enforceable in accordance with its terms against such Group Company and, to the Company's knowledge, the counterparties thereto (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity), (ii) the applicable Group Company and, to the Company's knowledge, the counterparties thereto are not in material breach of, or default under, any Material Contract and (iii) to the Company's knowledge, no event has occurred that (with or without due notice or lapse of time or both) that would result in a breach of, or default under, any Designated Material Contract by the applicable Group Company or the counterparties thereto that would result in a Company Material Adverse Effect. The Company has made available to SOAC true and complete copies of all Material Contracts in effect as of the date hereof.

Section 3.8 **Absence of Changes**. During the period beginning on January 1, 2021 and ending on the date of this Agreement, (a) no Company Material Adverse Effect has occurred and (b) except as expressly contemplated by this Agreement, any Ancillary Document or in connection with the transactions contemplated hereby and thereby, (i) the Group Companies have conducted their businesses in the ordinary course in all material respects, (ii) no Group Company has taken any action that would require the consent of SOAC if taken during the period from the date of this Agreement until the Closing pursuant to Section 5.1(b)(vi), Section 5.1(b)(viii), Section 5.1(b)(xi) or Section 5.1(b)(xv) (to the extent related to any of the foregoing) and (iii) no Group Company has taken any action that would require the consent of SOAC if taken during the period from the date of this Agreement until the Closing pursuant to Section 5.1(b)(i), Section 5.1(b)(xiv) or Section 5.1(b)(xv) (to the extent related to Section 5.1(b)(i) or Section 5.1(b)(xiv)).

Section 3.9 **Litigation**. There is (and since the Reference Date there has been) no Proceeding pending or, to the Company's knowledge, threatened against any Group Company that, if adversely decided or resolved, has been or would reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a

whole. Neither the Group Companies nor any of their respective properties or assets is subject to any material Order. As of the date of this Agreement, there are no material Proceedings by a Group Company pending against any other Person.

Section 3.10 Compliance with Applicable Law. Each Group Company (a) conducts (and since the Reference Date has conducted) its business in accordance with all Laws and Orders applicable to such Group Company and is not in violation of any such Law or Order and (b) has not received any written communications from a Governmental Entity that alleges that such Group Company is not in compliance with any Law or Order, except in each case of clauses (a) and (b), as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole.

Section 3.11 Employee Plans.

(a) Section 3.11(a) of the Company Disclosure Schedules sets forth a true and complete list of all Employee Benefit Plans (including, for each such Employee Benefit Plan, identifying its jurisdiction). With respect to each Employee Benefit Plan, the Group Companies have provided SOAC with true and complete copies of the material documents pursuant to which the plan is maintained, funded and administered, including, for each Employee Benefit Plan, to the extent applicable, (i) the most recent plan document and all amendments thereto, (ii) the most recent funding agreement (including any trust Contract or insurance Contract), (iii) the most recent service provider Contracts (including third-party administrative services, record-keeper, investment management and other services Contracts), (iv) the most recently prepared actuarial valuation report, (v) all material correspondence with any applicable Governmental Entity for the current year and the previous three (3) years, and (vi) the most recent employee booklet.

(b) No Employee Benefit Plan is, and no Group Company sponsors, maintains, contributes to (is required to contribute to) or has any Liability with respect to or under: (i) a Multiemployer Plan; (ii) a "defined benefit plan" (as defined in Section 3(35) of ERISA, whether or not subject to ERISA) or a plan that is or was subject to Title IV of ERISA or Section 412 of the Code; (iii) a "multiple employer plan" within the meaning of Section of 413(c) of the Code or Section 210 of ERISA; or (iv) a "multiple employer welfare arrangement" as defined in Section 3(40) of ERISA. No Employee Benefit Plan provides, and no Group Company has any Liability to provide, any retiree or post-termination or post-ownership health or life insurance or other welfare-type benefits to any Person other than health continuation coverage pursuant to COBRA or any similar Law and for which the recipient pays the full premium cost of coverage. No Group Company has any Liability by reason of at any time being considered a single employer under Section 414 of the Code with any other Person.

(c) Each Employee Benefit Plan has been established, maintained, operated, and administered in all material respects in accordance with its terms and all applicable Laws. Each Employee Benefit Plan that is intended to be qualified under Section 401(a) of the Code is so qualified and has timely received a current favorable determination or opinion or advisory letter from the Internal Revenue Service, and nothing has occurred which could adversely affect the qualification of such Employee Benefit Plan. None of the Group Companies has incurred (whether or not assessed) any penalty or Tax under Section 4980H, 4980B, 4980D, 6721 or 6722 of the Code.

(d) Each Employee Benefit Plan that constitutes in any part a "nonqualified deferred compensation plan" (as defined under Section 409A(d)(1) of the Code) subject to Section 409A of the Code has been operated and administered in all material respects in operational compliance with, and is in all material respects in documentary compliance with, Section 409A of the Code and its purpose, and no amount under any such plan, agreement or arrangement is or has been subject to the interest and additional Tax set forth under Section 409A(a)(1)(B) of the Code.

(e) There are no pending or, to the Company's knowledge, threatened, claims or Proceedings or disputes with respect to any Employee Benefit Plan (other than routine claims for benefits). There have been no "prohibited transactions" within the meaning of Section 4975 of the Code or Sections 406 or 407 of ERISA, or any breaches of fiduciary duty (as determined under ERISA) with respect to any Employee Benefit Plan. With respect to each Employee Benefit Plan, all material contributions, distributions, reimbursements and premium payments that are due have been timely made in accordance with the terms of such Employee Benefit Plan and applicable Law, or if not yet due, properly accrued.

(f) The execution and delivery of this Agreement and the consummation of the transactions contemplated by this Agreement will not materially (alone or in combination with any other event) (i) result in any payment or benefit becoming due to or result in the forgiveness of any indebtedness of any current or former director, manager, officer, employee, individual independent contractor or other service providers of any of the Group Companies, (ii) increase the amount or value of any compensation or benefits payable to any current or former director, manager, officer, employee, individual independent contractor or other service providers of any of the Group Companies or (iii) result in the acceleration of the time of payment or vesting or forfeiture, or trigger any payment or funding of any compensation or benefits to any current or former director, manager, officer, employee, individual independent contractor or other service providers of any of the Group Companies.

(g) No amount that could be received (whether in cash or property or the vesting of property) by any "disqualified individual" of any of the Group Companies under any Employee Benefit Plan or otherwise as a result of the consummation of the transactions contemplated by this Agreement could, separately or in the aggregate, be nondeductible under Section 280G of the Code or subjected to an excise tax under Section 4999 of the Code.

(h) The Group Companies have no material obligation to make a "gross-up" or similar payment in respect of any taxes that may become payable under Section 4999 or 409A of the Code.

(i) Each Foreign Benefit Plan that is required to be registered or intended to be tax exempt has been registered (and, where applicable, accepted for registration) and is tax exempt and has been maintained in good standing, to the extent applicable, with each Governmental Entity. To the Company's knowledge, no fact or circumstance exists that could adversely affect the preferential tax treatment ordinarily accorded to any such Foreign Benefit Plan. All material contributions required to have been made by or on behalf of the Group Companies with respect to plans or arrangements maintained or sponsored a Governmental Entity (including national or provincial pension scheme, social security, unemployment insurance, severance, termination indemnities or other similar benefits maintained for employees outside of the U.S.) have been timely made or fully accrued.

(j) No Foreign Benefit Plan is: (A) a "defined benefit plan" (as defined in ERISA, whether or not subject to ERISA); (B) a "registered pension plan" (within the meaning of subsection 248(1) of the Tax Act); (C) a "retirement compensation arrangement" (within the meaning of subsection 248(1) of the Tax Act); or (D) has any material unfunded or underfunded Liabilities. No Foreign Benefit Plan is intended to be, or has ever been determined or alleged by a Governmental Entity to be, a "salary deferral arrangement" within the meaning of subsection 248(1) of the Tax Act.

Section 3.12 Environmental Matters. Except as would not have a Company Material Adverse Effect:

(a) None of the Group Companies have received any written notice, report, Order, communication from any Governmental Entity or any other Person regarding any actual, alleged, or potential violation of, or Liability under, any Environmental Laws.

(b) There is (and since the Reference Date there has been) no Proceeding pending or, to the Company's knowledge, threatened in writing against any Group Company in respect of any Environmental Laws.

(c) There has been no manufacture, release, treatment, storage, disposal, arrangement for disposal, transport or handling of, distribution, release, contamination by, or exposure of any Person, or ownership or operation of any property or facility contaminated by, to any Hazardous Substances.

(d) The Group Companies have not assumed, undertaken, provided an indemnity with respect to or otherwise become subject to any Liability of any other Person under Environmental Law.

The Group Companies have made available to SOAC copies of all environmental assessments, audits and reports and all other material environmental, health and safety documents that are in any Group Company's possession or control relating to the current or former operations, properties or facilities of the Group Companies.

Section 3.13 Intellectual Property.

(a) Section 3.13(a) of the Company Disclosure Schedules sets forth a true and complete list of (i) all currently issued or pending Company Registered Intellectual Property, (ii) Company Licensed Intellectual Property and (iii) material unregistered Marks and Copyrights owned by any Group Company, in each case, as of the date of this Agreement. Section 3.13(a) of the Company Disclosure Schedules lists, for each item of Company

Registered Intellectual Property as of the date of this Agreement (A) the owner(s) of such item, (B) the jurisdictions in which such item has been issued or registered or filed, (C) the issuance, registration or application date, as applicable, for such item and (D) the issuance, registration or application number, as applicable, for such item.

(b) As of the date of this Agreement and the Closing, all necessary fees and filings with respect to any material Company Registered Intellectual Property have been timely submitted to the relevant intellectual property office or Governmental Entity and Internet domain name registrars to maintain such material Company Registered Intellectual Property in full force and effect. As of the date of this Agreement and the Closing, no issuance or registration obtained and no application filed by the Group Companies for any material Intellectual Property Rights has been cancelled, abandoned, allowed to lapse or not renewed, except where such Group Company has, in its reasonable business judgment, decided to cancel, abandon, allow to lapse or not renew such issuance, registration or application. As of the date of this Agreement, there are no Proceedings pending, including litigations, interference, re-examination, *inter parties* review, reissue, opposition, nullity, or cancellation proceedings pending that relate to any of the Company Registered Intellectual Property and, to the Company's knowledge, no such Proceedings are threatened by any Governmental Entity or any other Person.

(c) A Group Company exclusively owns all right, title and interest in and to all material Company Owned Intellectual Property, free and clear of all Liens or obligations to others (other than Permitted Liens). For all Patents owned by the Group Companies, each inventor on the Patent has assigned their rights to a Group Company. No Group Company has (i) transferred ownership of, or granted any exclusive license with respect to, any material Company Owned Intellectual Property to any other Person or (ii) granted any customer the right to use any material Company product or service on anything other than a non-exclusive basis. Section 3.13(c) of the Company Disclosure Schedules sets forth a list of all current Contracts for Company Licensed Intellectual Property as of the date of this Agreement to which any Person has been granted any license or covenant not to sue under, or otherwise has received or acquired any right (whether or not exercisable) or interest in, any Company Owned Intellectual Property, other than (A) licenses to Off-the-Shelf Software, (B) licenses to Public Software and (C) non-disclosure agreements and licenses granted by employees, individual consultants or individual contractors of any Group Company pursuant to Contracts with employees, individual consultants or individual contractors, in each case, that do not materially differ from the Group Companies' form therefor that has been made available to SOAC. The applicable Group Company has valid rights under all Contracts for Company Licensed Intellectual Property to use, sell, license and otherwise exploit, as the case may be, all Company Licensed Intellectual Property licensed pursuant to such Contracts as the same is currently used, sold, licensed and otherwise exploited by such Group Company, except as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole. The Company Owned Intellectual Property and the Company Licensed Intellectual Property, to the Company's knowledge, constitutes all of the Intellectual Property Rights used or held for use by the Group Companies in the operation of their respective businesses, and, to the Company's knowledge, all Intellectual Property Rights necessary and sufficient to enable the Group Companies to conduct their respective businesses as currently conducted in all material respects. The Company Registered Intellectual Property and the Company Licensed Intellectual Property, to the Company's knowledge, is valid, subsisting and enforceable, and, to the Company's knowledge, all of the Group Companies' rights in and to the Company Registered Intellectual Property, the Company Owned Intellectual Property and the Company Licensed Intellectual Property, are valid and enforceable (in each case, subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity).

(d) Each Group Company's employees, consultants, advisors and independent contractors who independently or jointly contributed to or otherwise participated in the authorship, invention, creation, improvement, modification or development of any material Company Owned Intellectual Property since the Reference Date (each such person, a "Creator") have agreed to maintain and protect the trade secrets and confidential information of all Group Companies. Each Group Company's employees, consultants, advisors and independent contractors who independently or jointly contributed to or otherwise participated in the authorship, invention, creation, improvement, modification or development of any material Company Owned Intellectual Property have assigned or have agreed to a present assignment to such Group Company all Intellectual Property Rights authored, invented, created, improved, modified or developed by such person in the course of such Creator's employment or other engagement with such Group Company.

(e) Each Group Company has taken all reasonable steps to safeguard and maintain the secrecy of any trade secrets, know-how and other confidential information owned by any Group Company. Without limiting

the foregoing, each Group Company has not disclosed any trade secrets, know-how or confidential information to any other Person unless such disclosure was under an appropriate written non-disclosure agreement containing appropriate limitations on use, reproduction and disclosure. To the Company's knowledge, there has been no violation or unauthorized access to or disclosure of any trade secrets, know-how or confidential information of or in the possession of by any Group Company, or of any written obligations with respect to such.

(f) None of the Company Owned Intellectual Property and, to the Company's knowledge, none of the Company Licensed Intellectual Property is subject to any outstanding Order that restricts in any manner the use, sale, transfer, licensing or exploitation thereof by the Group Companies or affects the validity, use or enforceability of any such Company Owned Intellectual Property, except as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole.

(g) To the Company's knowledge, neither the conduct of the business of the Group Companies nor any of the Company products offered, marketed, licensed, provided, sold, distributed or otherwise exploited by the Group Companies nor the design, development, manufacturing, reproduction, use, marketing, offer for sale, sale, importation, exportation, distribution, maintenance or other exploitation of any Company product infringes, constitutes or results from an unauthorized use or misappropriation of or otherwise violates any Intellectual Property Rights of any other Person, except as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole.

(h) Since the Reference Date, there is no Proceeding pending nor has any Group Company received any written communications or, to the Company's knowledge, any other communications (i) alleging that a Group Company has infringed, misappropriated or otherwise violated any Intellectual Property Rights of any other Person, (ii) challenging the validity, enforceability, use or exclusive ownership of any Company Owned Intellectual Property or (iii) inviting any Group Company to take a license under any Patent or consider the applicability of any Patents to any products or services of the Group Companies or to the conduct of the business of the Group Companies.

(i) To the Company's knowledge, no Person is infringing, misappropriating, misusing, diluting or violating any Company Owned Intellectual Property in any material respect. Since the Reference Date, no Group Company has made any written claim against any Person alleging any infringement, misappropriation or other violation of any Company Owned Intellectual Property in any material respect.

(j) None of the Company Owned Intellectual Property has been developed with any funding or assistance from a Governmental Entity.

(k) To the Company's knowledge, each Group Company has obtained, possesses and is in compliance with valid licenses to use all of the Software present on the computers and other Software-enabled electronic devices that it owns or leases or that is otherwise used by such Group Company and/or its employees in connection with the Group Company business, except as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as whole. No Group Company has disclosed or delivered to any escrow agent or any other Person, other than employees or contractors who are subject to confidentiality obligations, any of the source code that is Company Owned Intellectual Property, and no other Person has any right to, contingent or otherwise, including to obtain access to or use, any such source code. To the Company's knowledge, no event has occurred, and no circumstance or condition exists, that (with or without notice or lapse of time or both) will, or would reasonably be expected to, result in the delivery, license or disclosure of any source code that is owned by a Group Company or otherwise constitutes Company Owned Intellectual Property to any Person who is not, as of the date the event occurs or circumstance or condition comes into existence, a current employee or contractor of a Group Company subject to confidentiality obligations with respect thereto.

(l) No Software that is licensed under a Public Software license has been used, licensed, or distributed by or on behalf of any of the Group Companies in a manner that (i) requires any Company Owned Intellectual Property to be licensed, sold, disclosed, distributed, hosted or otherwise made available, including in source code form and/or for the purpose of making derivative works, for any reason, (ii) grants, or requires any Group Company to grant, the right to decompile, disassemble, reverse engineer or otherwise derive the source code or underlying structure of any Company Owned Intellectual Property, (iii) limits in any manner the ability to charge license fees or otherwise seek compensation in connection with marketing, licensing or distribution of any Company Owned Intellectual Property or (iv) otherwise imposes any limitation, restriction or condition on the right or ability of any Group Company to use, hold for use, license, host, distribute or otherwise dispose of any Company Owned

Intellectual Property, other than compliance with notice and attribution requirements, in each case, except as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole. The Group Companies are and have been in material compliance with all applicable licenses for all Public Software that is used in, incorporated into, combined with, linked with, distributed with, provided to any Person as a service in connection with, provided via a network as a service or application in connection with, or made available with, any Company product.

Section 3.14 Labor Matters.

(a) Since the Reference Date, (i) none of the Group Companies (A) has or has had any material Liability for any arrears of wages or other compensation for services (including salaries, wage premiums, commissions, fees or bonuses), or any penalties, fines, interest, or other sums for failure to pay or delinquency in paying such compensation, and (B) has or has had any material Liability for any payment to any trust or other fund governed by or maintained by or on behalf of any Governmental Entity with respect to unemployment compensation benefits, social security, social insurances or other benefits or obligations for any employees of any Group Company (other than routine payments to be made in the normal course of business and consistent with past practice); and (ii) the Group Companies have withheld all amounts required by applicable Law or by agreement to be withheld from wages, salaries and other payments to employees or independent contractors or other service providers of each Group Company, except as has not and would not reasonably be expected to result in, individually or in the aggregate, material Liability to the Group Companies.

(b) Since the Reference Date, there has been no “mass layoff” or “plant closing” as defined by WARN related to any Group Company, and the Group Companies have not incurred any material Liability under WARN nor will they incur any Liability under WARN as a result of the transactions contemplated by this Agreement.

(c) No Group Company is a party to or bound by any CBA and no employees of any Group Company are represented by any labor union, labor organization, works council, employee delegate, representative or other employee collective group with respect to their employment, whether by way of certification, interim certification, voluntary recognition or succession rights, and there is no application pending, or to the Company’s knowledge threatened, for any labor union, labor organization, works council, employee delegate, representative or other employee collective group to be certified as the bargaining agent of any employees of any Group Company. There is no duty on the part of any Group Company to bargain with any labor union, labor organization, works council, employee delegate, representative or other employee collective group, including in connection with the execution and delivery of this Agreement, the Ancillary Documents or the consummation of the transactions contemplated hereby or thereby. Since the Reference Date, no Group Company is or has been engaged in any unfair labour practice and there has been no actual or, to the Company’s knowledge, threatened unfair labor practice charges, material labor grievances, material labor arbitrations, strikes, lockouts, work stoppages, slowdowns, picketing, handbilling or other material labor disputes against or affecting any Group Company. Since the Reference Date, to the Company’s knowledge, in the last five years, there have been no actual, pending or threated labor organizing activities with respect to any employees of any Group Company and no trade union has applied to have any Group Company declared a common or related employer pursuant to applicable labour relations legislation in any jurisdiction in which any Group Company carries on business.

(d) No employee layoff, facility closure or shutdown (whether voluntary or by Order), reduction-in-force, furlough, temporary layoff, material work schedule change or reduction in hours, or reduction in salary or wages, or other workforce changes affecting employees of the Group Companies has occurred since March 1, 2020 or is currently contemplated, planned or announced, including as a result of COVID-19 or any Law, Order, directive, guideline or recommendation by any Governmental Entity in connection with or in response to COVID-19. The Group Companies have not otherwise experienced any material employment-related Liability with respect to or arising out of COVID-19 or any Law, Order, directive, guideline or recommendation by any Governmental Entity in connection with or in response to COVID-19.

Section 3.15 Insurance. The Company has made available to SOAC true and complete copies of all material policies of fire, liability, workers’ compensation, property, casualty and other forms of insurance owned or held by any Group Company as of the date of this Agreement. All such policies are in full force and effect, all premiums due and payable thereon as of the date of this Agreement have been paid in full as of the date of this Agreement. No

claim by any Group Company is pending under any such policies as to which coverage has been denied or disputed, or rights reserved to do so, by the underwriters thereof, except as is not and would not reasonably be expected to be, individually or in the aggregate, material to the Group Companies, taken as a whole.

Section 3.16 Tax Matters.

(a) Each Group Company has prepared and filed all material Tax Returns required to have been filed by it, all such Tax Returns are true and complete in all material respects and prepared in compliance in all material respects with all applicable Laws and Orders, and each Group Company has paid all material amounts of Taxes required to have been paid by it regardless of whether shown on a Tax Return.

(b) Each Group Company has timely withheld and paid to the appropriate Tax Authority all material amounts required to have been withheld and paid in connection with amounts paid or owing to any employee, individual independent contractor, other service providers, equity interest holder or other third-party.

(c) Each Group Company has timely collected and paid the appropriate Tax Authority all material amounts of Taxes required to have been so collected and paid.

(d) No Group Company is currently the subject of a Tax audit or examination or has been informed in writing of the commencement or anticipated commencement of any Tax audit or examination that has not been resolved or completed in each case with respect to material Taxes.

(e) No Group Company has consented to extend or waive the time in which any material Tax may be assessed or collected by any Tax Authority, other than any such extensions or waivers that are no longer in effect or that were extensions of time to file Tax Returns obtained in the ordinary course of business.

(f) No Group Company is or has been a party to any "listed transaction" as defined in Section 6707A of the Code and Treasury Regulations Section 1.6011-4 (or any corresponding or similar provision of state, local or non-U.S. Tax Law).

(g) There are no Liens for material Taxes on any assets of the Group Companies other than Permitted Liens.

(h) During the two (2)-year period ending on the date of this Agreement, no Group Company was a distributing corporation or a controlled corporation in a transaction purported or intended to be governed by Section 355 of the Code.

(i) No Group Company (i) has been a member of an affiliated group filing a consolidated, combined, affiliated, unitary or similar Tax Return (other than a group the common parent of which was a Group Company or any of its current Affiliates) or (ii) has any material Liability for the Taxes of any Person (other than a Group Company or any of its current Affiliates) under Section 160 of the Tax Act or Section 1.1502-6 of the Treasury Regulations (or any similar provision of state, local or non-United States Law), as a transferee or successor or by Contract (other than any Contract entered into in the ordinary course of business and the principal purpose of which does not relate to Taxes).

(j) No written claims have ever been made by any Tax Authority in a jurisdiction where a Group Company does not file Tax Returns that such Group Company is or may be subject to taxation by that jurisdiction, which claims have not been resolved or withdrawn.

(k) No Group Company is a party to any Tax allocation, Tax sharing or Tax indemnity or similar agreements (other than (i) one that is included in a Contract entered into in the ordinary course of business that is not primarily related to Taxes, or (ii) with any other Group Company or any of its current Affiliates) and no Group Company is a party to any joint venture, partnership or other arrangement (other than with any other Group Company or any of its current Affiliates) that is treated as a partnership for U.S. federal, state, local or non-U.S. Tax purposes.

(l) No Group Company has, or has ever been deemed to have, for purposes of the Tax Act or any relevant provincial legislation, acquired or had the use of property for proceeds greater than the fair market value thereof from, or disposed of property for proceeds less than the fair market value thereof to, or received or performed services or had the use of property for other than the fair market value from or to, or paid or received

interest or any other amount other than at a fair market value rate to or from, any Person with whom it does not deal at arm's length within the meaning of the Tax Act. Each Group Company has complied in all material respects with the transfer pricing provisions of applicable Tax Laws.

(m) The Company Shares are not "taxable Canadian property" within the meaning of the Tax Act.

(n) There are no circumstances which exist and would result in, or which have existed and resulted in, the application of any of sections 78, 80, 80.01, 80.02, 80.03 or 80.04 of the Tax Act, or any equivalent provincial provision to a Group Company..

(o) No Group Company has taken or agreed to take any action not contemplated by this Agreement and/or any Ancillary Document that would reasonably be expected to prevent the Transactions from qualifying for the Intended Tax Treatment

(p) No Group Company owns any United States real property interests within the meaning of Section 897(c) of the Code.

Section 3.17 Brokers. Except for fees (including a good faith estimate of the amounts due and payable assuming the Closing occurs) set forth on Section 3.17 of the Company Disclosure Schedules (which fees shall be the sole responsibility of the Company, except as otherwise provided in Section 9.6), no broker, finder, investment banker or other Person is entitled to any brokerage fee, finders' fee or other commission in connection with the transactions contemplated by this Agreement based upon arrangements made by or on behalf of the Company or any of its Affiliates for which any of the Group Companies has any obligation.

Section 3.18 Real and Personal Property.

(a) Owned Real Property. No Group Company owns any real property.

(b) Leased Real Property. Section 3.18(b) of the Company Disclosure Schedules sets forth a true and complete list (including street addresses) of all real property leased by any of the Group Companies that is material or leased pursuant to leases or agreements under which annual rental payments exceed $100,000 (the "Leased Real Property") and all Real Property Leases pursuant to which any Group Company is a tenant or landlord as of the date of this Agreement. True and complete copies of all such Real Property Leases have been made available to SOAC. Each Real Property Lease is in full force and effect and is a valid, legal and binding obligation of the applicable Group Company party thereto, enforceable in accordance with its terms against such Group Company and, to the Company's knowledge, each other party thereto (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity). There is no material breach or default by any Group Company or, to the Company's knowledge, any counterparty under any Real Property Lease, and, to the Company's knowledge, no event has occurred which (with or without notice or lapse of time or both) would constitute a material breach or default under any Real Property Lease or would permit termination of, or a material modification or acceleration thereof, by any counterparty to any Real Property Lease.

(c) Personal Property. Each Group Company has good, marketable and indefeasible title to, or a valid leasehold interest in or license or right to use, all of the material assets and properties of the Group Companies reflected in the Financial Statements or thereafter acquired by the Group Companies, except for assets disposed of in the ordinary course of business.

Section 3.19 Transactions with Affiliates. Section 3.19 of the Company Disclosure Schedules sets forth all Contracts between (a) any Group Company, on the one hand, and (b) any officer, director, employee, partner, member, manager, direct or indirect holder of Equity Securities or Affiliate of any Group Company (other than, for the avoidance of doubt, any other Group Company) or any family member of the foregoing Persons, on the other hand (each Person identified in this clause (b), a "Company Related Party"), other than (i) Contracts with respect to a Company Related Party's employment with (including benefit plans and other ordinary course compensation from) any of the Group Companies entered into in the ordinary course of business (ii) Contracts with respect to a Company Shareholder's or a holder of Company Options' status as a holder of Company Shares or Company Options, as applicable and (iii) Contracts entered into after the date of this Agreement that are either permitted pursuant to Section 5.1(b) or entered into in accordance with Section 5.1(b). No Company Related Party (A) owns any interest in any material asset or property used in any Group Company's business, or (B) owes any material amount to, or is

owed any material amount by, any Group Company (other than accrued compensation, employee benefits, employee or director expense reimbursement, in each case, in the ordinary course of business or pursuant to any transaction entered into after the date of this Agreement that is either permitted pursuant to Section 5.1(b) or entered into in accordance with Section 5.1(b)). All Contracts, arrangements, understandings, interests and other matters that are required to be disclosed pursuant to this Section 3.19 (including, for the avoidance of doubt, pursuant to the second sentence of this Section 3.19) are referred to herein as "Company Related Party Transactions".

Section 3.20 Data Privacy and Security.

(a) Each Group Company has implemented written policies relating to the Processing of Personal Data as and to the extent required by applicable Law ("Privacy and Data Security Policies").

(b) The Company has not received notice of any pending Proceedings, nor has there been any material Proceedings against any Group Company initiated by any Person (including (i) the United States Federal Trade Commission, any state attorney general or similar state official, or (ii) any other Governmental Entity) alleging that any Processing of Personal Data by or on behalf of a Group Company (A) is in violation of any applicable Privacy Laws or (B) is in violation of any Privacy and Data Security Policies.

(c) Since the Reference Date, (i) there has been no unauthorized access to or Processing of Personal Data in the possession or control of any Group Company and (ii) there have been no material Security Incidents with respect to any Company IT Systems, or Personal Data, except, in the case of clauses (i) and (ii), as would not have a Company Material Adverse Effect.

(d) Each Group Company owns or has license to use the Company IT Systems as necessary to operate the business of each Group Company as currently conducted.

Section 3.21 Compliance with International Trade & Anti-Corruption Laws.

(a) Neither the Group Companies nor, to the Company's knowledge, any of their Representatives, or any other Persons acting for or on behalf of any of the foregoing, is or has been, in the last five (5) years, (i) a Person named on any Sanctions and Export Control Laws-related list of designated Persons maintained by a Governmental Entity; (ii) located, organized or resident in a country or territory which is itself the subject of or target of any Sanctions and Export Control Laws; (iii) an entity owned, directly or indirectly, by one or more Persons described in clause (i) or (ii); or (iv) otherwise engaging in dealings with or for the benefit of any Person described in clauses (i) through (iii) or any country or territory which is or has, in the last five (5) years, been the subject of or target of any Sanctions and Export Control Laws (at the time of this Agreement, the Crimea region of Ukraine, Cuba, Iran, North Korea, Venezuela and Syria).

(b) In the last five (5) years, none of the Group Companies have received from any Governmental Entity or any other Person any notice, inquiry, or internal or external allegation, made any voluntary or involuntary disclosure to a Governmental Entity, or conducted any internal investigation or audit concerning any actual or potential violation or wrongdoing, in each case, related to, or in connection with Sanctions and Export Control Laws.

(c) Neither the Group Companies nor, to the Company's knowledge, any of their Representatives, or any other Persons acting for or on behalf of any of the foregoing has (i) made, offered, promised, paid or received any unlawful bribes, kickbacks or other similar payments to or from any Person, (ii) made or paid any contributions, directly or indirectly, to a domestic or foreign political party or candidate that violate Anti-Corruption Laws or (iii) otherwise made, offered, received, authorized, promised or paid any improper payment prohibited under any Anti-Corruption Laws.

(d) The Group Companies have adopted a system of policies, procedures, and internal controls to the extent required by applicable Anti-Corruption Laws and any such policies, procedures and internal controls are reasonably designed to prevent material violations of such Anti-Corruption Laws.

Section 3.22 Information Supplied. None of the information supplied or to be supplied by or on behalf of the Group Companies expressly for inclusion or incorporation by reference prior to the Closing in the Registration Statement/Proxy Statement will, when the Registration Statement/Proxy Statement is declared effective or when

the Registration Statement/Proxy Statement is mailed to the Pre-Closing SOAC Shareholders or at the time of the SOAC Shareholders Meeting, and in the case of any amendment thereto, at the time of such amendment, contain any Misrepresentation.

Section 3.23 Regulatory Compliance.

(a) Since the Reference Date, none of the Group Companies have held any material Regulatory Permits and no such Regulatory Permits are or have been necessary for the Group Companies to conduct their respective businesses. To the Company's knowledge, no Governmental Entity has stated or otherwise indicated that a material Regulatory Permit is required for the Group Companies to conduct their respective businesses.

(b) There is (and since the Reference Date there has been) no Proceeding or, to the Company's knowledge, threatened against any Group Company related to compliance with UNCLOS Laws and Regulations, including by a Governmental Entity (including the ISA or sponsoring state). The Group Companies are, and since the Reference Date have remained in compliance with UNCLOS Laws and Regulations. Each of the Group Companies currently have the use and benefit of all Contracts executed in connection with their obligations under the UNCLOS Laws and Regulations, and will continue to have the use and benefit of such Contracts immediately following the consummation of the transactions contemplated by this Agreement.

(c) Since the Reference Date, no Group Company has undergone, or is currently undergoing, any Governmental Entity investigation or received any allegations of non-compliance with applicable Anti-Corruption Laws.

Section 3.24 Investigation; No Other Representations.

(a) The Company, on its own behalf and on behalf of its Representatives, acknowledges, represents, warrants and agrees that (i) it has conducted its own independent review and analysis of, and, based thereon, has formed an independent judgment concerning, the business, assets, condition, operations and prospects of, the SOAC Parties and (ii) it has been furnished with or given access to such documents and information about the SOAC Parties and their respective businesses and operations as it and its Representatives have deemed necessary to enable it to make an informed decision with respect to the execution, delivery and performance of this Agreement, the Ancillary Documents and the transactions contemplated hereby and thereby.

(b) In entering into this Agreement and the Ancillary Documents to which it is or will be a party, the Company has relied solely on its own investigation and analysis and the representations and warranties expressly set forth in Article 4 and in the Ancillary Documents to which it is or will be a party and no other representations or warranties of any SOAC Party, any SOAC Non-Party Affiliate or any other Person, either express or implied, and the Company, on its own behalf and on behalf of its Representatives, acknowledges, represents, warrants and agrees that, except for the representations and warranties expressly set forth in Article 4 and in the Ancillary Documents to which it is or will be a party, none of the SOAC Parties, SOAC Non-Party Affiliate or any other Person makes or has made any representation or warranty, either express or implied, in connection with or related to this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby.

Section 3.25 EXCLUSIVITY OF REPRESENTATIONS AND WARRANTIES. NOTWITHSTANDING THE DELIVERY OR DISCLOSURE TO ANY SOAC PARTY OR ANY OF THEIR RESPECTIVE REPRESENTATIVES OF ANY DOCUMENTATION OR OTHER INFORMATION (INCLUDING ANY FINANCIAL PROJECTIONS OR OTHER SUPPLEMENTAL DATA), EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS ARTICLE 3 OR THE ANCILLARY DOCUMENTS, NONE OF THE COMPANY, ANY COMPANY NON-PARTY AFFILIATE OR ANY OTHER PERSON MAKES, AND THE COMPANY EXPRESSLY DISCLAIMS, ANY REPRESENTATIONS OR WARRANTIES OF ANY KIND OR NATURE, EXPRESS OR IMPLIED, IN CONNECTION WITH THIS AGREEMENT, THE ANCILLARY DOCUMENTS OR ANY OF THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY, INCLUDING AS TO THE MATERIALS RELATING TO THE BUSINESS AND AFFAIRS OR HOLDINGS OF THE GROUP COMPANIES THAT HAVE BEEN MADE AVAILABLE TO ANY SOAC PARTY OR ANY OF THEIR REPRESENTATIVES OR IN ANY PRESENTATION OF THE BUSINESS AND AFFAIRS OF THE GROUP COMPANIES BY THE MANAGEMENT OR ON BEHALF OF THE COMPANY OR OTHERS IN CONNECTION WITH THE TRANSACTIONS

CONTEMPLATED HEREBY OR BY THE ANCILLARY DOCUMENTS, AND NO STATEMENT CONTAINED IN ANY OF SUCH MATERIALS OR MADE IN ANY SUCH PRESENTATION SHALL BE DEEMED A REPRESENTATION OR WARRANTY HEREUNDER OR OTHERWISE OR DEEMED TO BE RELIED UPON BY ANY SOAC PARTY, ANY OF ITS REPRESENTATIVES OR ANY SOAC NON-PARTY AFFILIATE IN EXECUTING, DELIVERING OR PERFORMING THIS AGREEMENT, THE ANCILLARY DOCUMENTS OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY. EXCEPT FOR THE REPRESENTATIONS AND WARRANTIES EXPRESSLY SET FORTH IN ARTICLE 3 OR THE ANCILLARY DOCUMENTS, IT IS UNDERSTOOD THAT ANY COST ESTIMATES, PROJECTIONS OR OTHER PREDICTIONS, ANY DATA, ANY FINANCIAL INFORMATION OR ANY MEMORANDA OR OFFERING MATERIALS OR PRESENTATIONS, INCLUDING ANY OFFERING MEMORANDUM OR SIMILAR MATERIALS MADE AVAILABLE BY OR ON BEHALF OF ANY GROUP COMPANY ARE NOT AND SHALL NOT BE DEEMED TO BE OR TO INCLUDE REPRESENTATIONS OR WARRANTIES OF THE COMPANY, ANY COMPANY NON-PARTY AFFILIATE OR ANY OTHER PERSON, AND ARE NOT AND SHALL NOT BE DEEMED TO BE RELIED UPON BY ANY SOAC PARTY, ANY OF ITS REPRESENTATIVES OR ANY SOAC NON-PARTY AFFILIATE IN EXECUTING, DELIVERING OR PERFORMING THIS AGREEMENT, THE ANCILLARY DOCUMENTS OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY.

ARTICLE 4
REPRESENTATIONS AND WARRANTIES RELATING TO THE SOAC PARTIES

(a) Subject to Section 9.8, except as set forth on the SOAC Disclosure Schedules, or (b) except as set forth in any SOAC SEC Reports (excluding any disclosures in any "risk factors" section that do not constitute statements of fact, disclosures in any forward-looking statements disclaimers and other disclosures that are generally cautionary, predictive or forward-looking in nature), each SOAC Party hereby represents and warrants to the Company as follows:

Section 4.1 Organization and Qualification. Each SOAC Party is an exempted company, corporation, limited liability company or other applicable business entity duly organized, incorporated or formed, as applicable, validly existing and in good standing (or the equivalent thereof, if applicable, in each case, with respect to the jurisdictions that recognize the concept of good standing or any equivalent thereof) under the Laws of its jurisdiction of organization, incorporation or formation (as applicable).

Section 4.2 Authority. Each SOAC Party has the requisite exempted company, corporate, limited liability company or other similar power and authority to execute and deliver this Agreement and each Ancillary Document to which it is or will be a party, to perform its obligations hereunder and thereunder, and to consummate the transactions contemplated hereby and thereby. Subject to the receipt of the SOAC Shareholder Approval, the execution and delivery of this Agreement, the Ancillary Documents to which a SOAC Party is or will be a party and the consummation of the transactions contemplated hereby and thereby have been (or, in the case of any Ancillary Document entered into after the date of this Agreement, will be upon execution thereof) duly authorized by all necessary exempted company, corporate, limited liability company or other similar action on the part of such SOAC Party. This Agreement has been and each Ancillary Document to which a SOAC Party is or will be a party will be, upon execution thereof, duly and validly executed and delivered by such SOAC Party and constitutes or will constitute, upon execution thereof, as applicable, a valid, legal and binding agreement of such SOAC Party (assuming this Agreement has been and the Ancillary Documents to which such SOAC Party is or will be a party are or will be, upon execution thereof, as applicable, duly authorized, executed and delivered by the other Persons party hereto or thereto), enforceable against such SOAC Party in accordance with their terms (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity).

Section 4.3 Consents and Requisite Governmental Approvals; No Violations.

(a) No consent, approval or authorization of, or designation, declaration or filing with, any Governmental Entity is required on the part of a SOAC Party with respect to such SOAC Party's execution, delivery or performance of its obligations under this Agreement or the Ancillary Documents to which it is or will be party or the consummation of the transactions contemplated hereby or thereby, except for (i) the Investment Canada Act Approval (if required); (ii) the filing with the SEC of (A) the Registration Statement/Proxy Statement and the declaration of the effectiveness thereof by the SEC and (B) such reports under Section 13(a) or 15(d) of the

Exchange Act as may be required in connection with this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby, (iii) such filings with and approvals of NYSE to permit the SOAC Common Shares to be issued in connection with the transactions contemplated by this Agreement and the other Ancillary Documents to be listed on NYSE, (iv) such filings and approvals required in connection with the SOAC Continuance, (v) the SOAC Shareholder Approval or (vi) any other consents, approvals, authorizations, designations, declarations, waivers or filings, the absence of which would not have a SOAC Material Adverse Effect.

(b) None of the execution or delivery by a SOAC Party of this Agreement or any Ancillary Document to which it is or will be a party, the performance by a SOAC Party of its obligations hereunder or thereunder or the consummation by a SOAC Party of the transactions contemplated hereby or thereby will, directly or indirectly (with or without due notice or lapse of time or both) (i) result in a breach of any provision of the Governing Documents of a SOAC Party, (ii) result in a violation or breach of, or constitute a default or give rise to any right of termination, Consent, cancellation, amendment, modification, suspension, revocation or acceleration under, any of the terms, conditions or provisions of any Contract to which a SOAC Party is a party, (iii) violate, or constitute a breach under, any Order or applicable Law to which any such SOAC Party or any of its properties or assets are bound or (iv) result in the creation of any Lien upon any of the assets or properties (other than any Permitted Liens) of a SOAC Party, except in the case of any of clauses (ii) through (iv) above, as would not have a SOAC Material Adverse Effect.

Section 4.4 Brokers. Except for fees (including a good faith estimate of the amounts due and payable assuming the Closing occurs) set forth on Section 4.4 of the SOAC Disclosure Schedules (which fees shall be the sole responsibility of SOAC), no broker, finder, investment banker or other Person is entitled to any brokerage fee, finders' fee or other commission in connection with the transactions contemplated by this Agreement based upon arrangements made by or on behalf of any SOAC Party for which a SOAC Party has any obligation.

Section 4.5 Information Supplied. None of the information supplied or to be supplied by or on behalf of either SOAC Party expressly for inclusion or incorporation by reference prior to the Closing in the Registration Statement/Proxy Statement will, when the Registration Statement/Proxy Statement is declared effective or when the Registration Statement/Proxy Statement is mailed to the Pre-Closing SOAC Shareholders or at the time of the SOAC Shareholders Meeting, and in the case of any amendment thereto, at the time of such amendment, contain any Misrepresentation.

Section 4.6 Capitalization of the SOAC Parties.

(a) Section 4.6(a) of the SOAC Disclosure Schedules sets forth a true and complete statement of the number and class or series (as applicable) of the issued and outstanding SOAC Shares and the SOAC Warrants prior to the consummation of the SOAC Continuance. All outstanding Equity Securities of SOAC (except to the extent such concepts are not applicable under the applicable Law of SOAC's jurisdiction of organization, incorporation or formation, as applicable, or other applicable Law) prior to the consummation of the SOAC Continuance have been duly authorized and validly issued and are fully paid and non-assessable. Such Equity Securities (i) were not issued in violation of the Governing Documents of SOAC and (ii) are not subject to any preemptive rights, call option, right of first refusal, subscription rights, transfer restrictions or similar rights of any Person (other than transfer restrictions under applicable Securities Laws or under the Governing Documents of SOAC) and were not issued in violation of any preemptive rights, call option, right of first refusal, subscription rights, transfer restrictions or similar rights of any Person. Except for the SOAC Shares and SOAC Warrants set forth on Section 4.6(a) of the SOAC Disclosure Schedules (taking into account, for the avoidance of doubt, any changes or adjustments to the SOAC Shares and SOAC Warrants as a result of, or to give effect to, the SOAC Continuance and assuming that no SOAC Shareholder Redemptions are effected), immediately prior to Closing and before giving effect to the PIPE Financing, there shall be no other Equity Securities of SOAC issued and outstanding.

(b) Immediately after the Effective Time, (i) the authorized share capital of SOAC will consist of an unlimited number of SOAC Common Shares and an unlimited number of preferred shares, each without par value, the Earnout Shares and the Vesting Sponsor Shares, (ii) all of the issued and outstanding SOAC Common Shares, the Earnout Shares and the Vesting Sponsor Shares (A) will be duly authorized, validly issued, fully paid and nonassessable, (B) will have been issued in compliance in all material respects with applicable Law and (C) will not have been issued in breach or violation of any preemptive rights or Contract to which SOAC is a party or bound, and (iii) no preferred shares will be issued and outstanding

(c) Except as expressly contemplated by this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby or as otherwise either permitted pursuant to Section 5.9 or issued, granted or entered into, as applicable, in accordance with Section 5.9, there are no outstanding (A) equity appreciation, phantom equity or profit participation rights or (B) options, restricted stock, phantom stock, warrants, purchase rights, subscription rights, conversion rights, exchange rights, calls, puts, rights of first refusal or first offer or other Contracts that could require SOAC to issue, sell or otherwise cause to become outstanding or to acquire, repurchase or redeem any Equity Securities or securities convertible into or exchangeable for Equity Securities of SOAC.

(d) The Equity Securities of NewCo Sub outstanding as of the date of this Agreement (i) have been duly authorized and validly issued and are fully paid and nonassessable, (ii) were issued in compliance in all material respects with applicable Law, and (iii) were not issued in breach or violation of any preemptive rights or Contract to which NewCo Sub is a party or bound. All of the outstanding Equity Securities of NewCo Sub are owned directly by SOAC free and clear of all Liens (other than transfer restrictions under applicable Securities Law). As of the date of this Agreement, SOAC has no Subsidiaries other than NewCo Sub and does not own, directly or indirectly, any Equity Securities in any Person other than NewCo Sub.

Section 4.7 **SEC Filings**. SOAC has timely filed or furnished all statements, forms, reports and documents required to be filed or furnished by it prior to the date of this Agreement with the SEC pursuant to Federal Securities Laws since its initial public offering (collectively, and together with any exhibits and schedules thereto and other information incorporated therein, and as they have been supplemented, modified or amended since the time of filing, the "SOAC SEC Reports"), and, as of the Closing, will have filed or furnished all other statements, forms, reports and other documents required to be filed or furnished by it subsequent to the date of this Agreement with the SEC pursuant to Federal Securities Laws through the Closing (collectively, and together with any exhibits and schedules thereto and other information incorporated therein, and as they have been supplemented, modified or amended since the time of filing, but excluding the Registration Statement/Proxy Statement, the "Additional SOAC SEC Reports"). Each of the SOAC SEC Reports, as of their respective dates of filing, and as of the date of any amendment or filing that superseded the initial filing, complied and each of the Additional SOAC SEC Reports, as of their respective dates of filing, and as of the date of any amendment or filing that superseded the initial filing, will comply, in all material respects with the applicable requirements of the Federal Securities Laws (including, as applicable, the Sarbanes-Oxley Act and any rules and regulations promulgated thereunder) applicable to the SOAC SEC Reports or the Additional SOAC SEC Reports (for purposes of the Additional SOAC SEC Reports, assuming that the representation and warranty set forth in Section 3.22 is true and correct in all respects with respect to all information supplied by or on behalf of Group Companies expressly for inclusion or incorporation by reference therein). As of their respective dates of filing, the SOAC SEC Reports did not contain any Misrepresentation (for purposes of the Additional SOAC SEC Reports, assuming that the representation and warranty set forth in Section 3.22 is true and correct in all respects with respect to all information supplied by or on behalf of Group Companies expressly for inclusion or incorporation by reference therein). As of the date of this Agreement, there are no outstanding or unresolved comments in comment letters received from the SEC with respect to the SOAC SEC Reports.

Section 4.8 **Trust Account**. As of the date of this Agreement, SOAC has an amount in cash in the Trust Account equal to at least $300,000,000. The funds held in the Trust Account are (a) invested in United States "government securities" within the meaning of Section 2(a)(16) of the Investment Company Act, having a maturity of 185 days or less or in money market funds meeting certain conditions under Rule 2a-7 promulgated under the Investment Company Act which invest only in direct U.S. government treasury obligations and (b) held in trust pursuant to that certain Investment Management Trust Agreement, dated May 8, 2020 (the "Trust Agreement"), between SOAC and Continental Stock Transfer & Trust Company, as trustee (the "Trustee"). There are no separate agreements, side letters or other agreements or understandings (whether written or unwritten, express or implied) that would cause the description of the Trust Agreement in the SOAC SEC Reports to be inaccurate in any material respect or, to SOAC's knowledge, that would entitle any Person to any portion of the funds in the Trust Account (other than (i) in respect of deferred underwriting commissions or Taxes, (ii) the Pre-Closing SOAC Shareholders who shall have elected to redeem their SOAC Class A Shares pursuant to the Governing Documents of SOAC or (iii) if SOAC fails to complete a business combination within the allotted time period set forth in the Governing Documents of SOAC and liquidates the Trust Account, subject to the terms of the Trust Agreement, SOAC (in limited amounts to permit SOAC to pay the expenses of the Trust Account's liquidation, dissolution and winding up of SOAC) and then the Pre-Closing SOAC Shareholders). Prior to the Closing, none of the funds held in the Trust Account are permitted to be released, except in the circumstances described in the Governing Documents of SOAC

and the Trust Agreement. As of the date of this Agreement, SOAC has performed all material obligations required to be performed by it, and is not in material default or delinquent in performance or any other respect (claimed or actual) in connection with the Trust Agreement, and, to SOAC's knowledge, no event has occurred which (with due notice or lapse of time or both) would constitute such a material default under the Trust Agreement. As of the date of this Agreement, there are no Proceedings pending with respect to the Trust Account. Since May 8, 2020, SOAC has not released any money from the Trust Account (other than interest income earned on the funds held in the Trust Account as permitted by the Trust Agreement). Upon the consummation of the transactions contemplated hereby (including the distribution of assets from the Trust Account (A) in respect of deferred underwriting commissions or Taxes or (B) to the Pre-Closing SOAC Shareholders who have elected to redeem their SOAC Class A Shares pursuant to the Governing Documents of SOAC, each in accordance with the terms of and as set forth in the Trust Agreement), SOAC shall have no further obligation under either the Trust Agreement or the Governing Documents of SOAC to liquidate or distribute any assets held in the Trust Account, and the Trust Agreement shall terminate in accordance with its terms.

Section 4.9 Transactions with Affiliates. Section 4.9 of the SOAC Disclosure Schedules sets forth all Contracts between (a) SOAC, on the one hand, and (b) any officer, director, employee, partner, member, manager, direct or indirect equityholder or Affiliate of SOAC or the Sponsor, on the other hand (each Person identified in this clause (b), a "SOAC Related Party"), other than (i) Contracts with respect to a Pre-Closing SOAC Shareholder's or a holder of SOAC Warrants' status as a holder of SOAC Shares or SOAC Warrants, as applicable and (iii) Contracts entered into after the date of this Agreement that are either permitted pursuant to Section 5.9 or entered into in accordance with Section 5.9. No SOAC Related Party (A) owns any interest in any material asset or property used in the business of SOAC, or (B) owes any material amount to, or is owed any material amount by, SOAC (other than accrued compensation, employee benefits, employee or director expense reimbursement, in each case, in the ordinary course of business or pursuant to a transaction entered into after the date of this Agreement that is either permitted pursuant to Section 5.9 or entered into in accordance with Section 5.9). All Contracts, arrangements, understandings, interests and other matters that are required to be disclosed pursuant to this Section 4.9 (including, for the avoidance of doubt, pursuant to the second sentence of this Section 4.9) are referred to herein as "SOAC Related Party Transactions".

Section 4.10 Litigation. As of the date of this Agreement, there is (and since its organization, incorporation or formation, as applicable, there has been) no Proceeding pending or, to SOAC's knowledge, threatened against any SOAC Party that, if adversely decided or resolved, would be material to the SOAC Parties, taken as a whole. None of the SOAC Parties nor any of their respective properties or assets is subject to any material Order. As of the date of this Agreement, there are no material Proceedings by any SOAC Party pending against any other Person.

Section 4.11 Compliance with Applicable Law. Each SOAC Party is (and since its organization, incorporation or formation, as applicable, has been) in compliance with all applicable Laws, except as would not have a SOAC Material Adverse Effect.

Section 4.12 NewCo Sub Activities. NewCo Sub was incorporated and organized solely for the purpose of entering into this Agreement, the Ancillary Documents to which it is or will be a party, the performance of its covenants and agreements in this Agreement and the Ancillary Documents, the consummation of the Arrangement, and the consummation of the transactions contemplated hereby and thereby and has not engaged in any activities or business, other than those incident or related to, or incurred in connection with, its organization, incorporation, corporate existence or the negotiation, preparation or execution of this Agreement or any Ancillary Document to which it is or will be a party, the performance of its covenants or agreements in this Agreement or any Ancillary Document, the consummation of the Arrangement or the consummation of the transactions contemplated hereby or thereby.

Section 4.13 Internal Controls; Listing; Financial Statements.

(a) Except as is not required in reliance on exemptions from various reporting requirements by virtue of SOAC's status as an "emerging growth company" within the meaning of the Securities Act, as modified by the JOBS Act, or "smaller reporting company" within the meaning of the Exchange Act, since its initial public offering, (i) SOAC has established and maintained a system of internal controls over financial reporting (as defined in Rule 13a-15 and Rule 15d-15 under the Exchange Act) sufficient to provide reasonable assurance regarding the reliability of SOAC's financial reporting and the preparation of SOAC's financial statements for external purposes in accordance with GAAP and (ii) SOAC has established and maintained disclosure controls and procedures (as

defined in Rule 13a-15 and Rule 15d-15 under the Exchange Act) designed to ensure that material information relating to SOAC is made known to SOAC's principal executive officer and principal financial officer by others within SOAC.

(b) SOAC has not taken any action prohibited by Section 402 of the Sarbanes-Oxley Act.

(c) Since its initial public offering, SOAC has complied in all material respects with all applicable listing and corporate governance rules and regulations of NYSE. The classes of securities representing issued and outstanding SOAC Class A Shares are registered pursuant to Section 12(b) of the Exchange Act and are listed for trading on NYSE. As of the date of this Agreement, there is no material Proceeding pending or, to SOAC's knowledge, threatened against SOAC by NYSE or the SEC with respect to any intention by such entity to deregister SOAC Class A Shares or prohibit or terminate the listing of SOAC Class A Shares on NYSE. SOAC has not taken any action that is designed to terminate the registration of SOAC Class A Shares under the Exchange Act.

(d) The SOAC SEC Reports contain true and complete copies of the applicable SOAC Financial Statements. The SOAC Financial Statements (i) fairly present in all material respects the financial position of SOAC as at the respective dates thereof, and the results of its operations, shareholders' equity and cash flows for the respective periods then ended (subject, in the case of any unaudited interim financial statements, to normal year-end audit adjustments (none of which is expected to be material) and the absence of notes thereto), (ii) were prepared in conformity with GAAP applied on a consistent basis during the periods indicated (except, in the case of any audited financial statements, as may be indicated in the notes thereto and subject, in the case of any unaudited financial statements, to normal year-end audit adjustments (none of which is expected to be material) and the absence of notes thereto, (iii) in the case of the audited SOAC Financial Statements, were audited in accordance with the standards of the PCAOB and (iv) comply in all material respects with the applicable accounting requirements and with the rules and regulations of the SEC, the Exchange Act and the Securities Act in effect as of the respective dates thereof (including Regulation S-X or Regulation S-K, as applicable).

(e) SOAC has established and maintains systems of internal accounting controls that are designed to provide, in all material respects, reasonable assurance that (i) all transactions are executed in accordance with management's authorization and (ii) all transactions are recorded as necessary to permit preparation of proper and accurate financial statements in accordance with GAAP and to maintain accountability for SOAC's and its Subsidiaries' assets. SOAC maintains and, for all periods covered by the SOAC Financial Statements, has maintained books and records of SOAC in the ordinary course of business that are accurate and complete and reflect the revenues, expenses, assets and liabilities of SOAC in all material respects.

(f) Since its incorporation, SOAC has not received any written complaint, allegation, assertion or claim that there is (i) a "significant deficiency" in the internal controls over financial reporting of SOAC, (ii) a "material weakness" in the internal controls over financial reporting of SOAC or (iii) fraud, whether or not material, that involves management or other employees of SOAC who have a significant role in the internal controls over financial reporting of SOAC.

Section 4.14 **No Undisclosed Liabilities**. Except for the Liabilities (a) set forth in Section 4.14 of the SOAC Disclosure Schedules, (b) incurred in connection with the negotiation, preparation or execution of this Agreement or any Ancillary Document, the performance of its covenants or agreements in this Agreement or any Ancillary Document or the consummation of the transactions contemplated hereby or thereby (it being understood and agreed that the expected third parties that are, as of the date hereof, entitled to fees, expenses or other payments in connection with the matters described in this clause (b) shall be set forth on Section 4.14 of the SOAC Disclosure Schedules), (c) that are incurred in connection with or incident or related to a SOAC Party's organization, incorporation or formation, as applicable, or continuing corporate (or similar) existence, in each case, which are immaterial in nature, (d) that are incurred in connection with activities that are administrative or ministerial, in each case, which are immaterial in nature, (e) that are either permitted pursuant to Section 5.9 or incurred in accordance with Section 5.9 or (f) set forth or disclosed in the SOAC Financial Statements included in the SOAC SEC Reports, none of the SOAC Parties has any material Liabilities of the type required to be set forth on a balance sheet in accordance with GAAP.

Section 4.15 Tax Matters.

(a) SOAC has prepared and filed all material Tax Returns required to have been filed by it, all such Tax Returns are true and complete in all material respects and prepared in compliance in all material respects with all applicable Laws and Orders, and SOAC has paid all material Taxes required to have been paid or deposited by it regardless of whether shown on a Tax Return.

(b) SOAC has timely withheld and paid to the appropriate Tax Authority all material amounts required to have been withheld and paid in connection with amounts paid or owing to any employee, individual independent contractor, other service providers, equity interest holder or other third-party.

(c) SOAC is not currently the subject of a Tax audit or examination and has not been informed in writing of the commencement or anticipated commencement of any Tax audit or examination that has not been resolved or completed, in each case with respect to material Taxes.

(d) SOAC has not consented to extend or waive the time in which any material Tax may be assessed or collected by any Tax Authority, other than any such extensions or waivers that are no longer in effect or that were extensions of time to file Tax Returns obtained in the ordinary course of business, in each case with respect to material Taxes.

(e) No "closing agreement" as described in Section 7121 of the Code (or any corresponding or similar provision of state, local or non-U.S. Law), private letter rulings, technical advice memoranda or similar agreements or rulings have been entered into or issued by any Tax Authority with respect to any SOAC Party which agreement or ruling would be effective after the Closing Date.

(f) None of the SOAC Parties is and none of the SOAC Parties has been a party to any "listed transaction" as defined in Section 6707A of the Code and Treasury Regulations Section 1.6011-4 (or any corresponding or similar provision of state, local or non-U.S. Tax Law).

(g) No SOAC Party is a party to any Tax allocation, Tax sharing or Tax indemnity or similar agreements and no SOAC Party is a party to any joint venture, partnership or other arrangement (that is treated as a partnership for U.S. federal, state, local or non-U.S. Tax purposes.

(h) For U.S. federal income tax purposes, NewCo Sub has been treated as disregarded from SOAC effective since its formation.

(i) None of the SOAC Parties has taken or agreed to take any action not contemplated by this Agreement and/or any Ancillary Documents that would reasonably be expected to prevent the Transactions or the SOAC Continuance from qualifying for the Intended Tax Treatment.

Section 4.16 SOAC Expenses. As of the Closing, the sum of (a) the SOAC Expenses *plus* (b) the SOAC Liabilities shall not exceed $50 million, not including (x) any amounts set forth on Section 4.16 of the SOAC Disclosure Schedules and (y) any payments made or payments payable by Sponsor pursuant to Section 11 of the Sponsor Letter Agreement (which, for the avoidance of doubt, shall not include any amounts set forth on Section 4.16 of the SOAC Disclosure Schedules).

Section 4.17 Investigation; No Other Representations.

(a) Each SOAC Party, on its own behalf and on behalf of its Representatives, acknowledges, represents, warrants and agrees that (i) it has conducted its own independent review and analysis of, and, based thereon, has formed an independent judgment concerning, the business, assets, condition, operations and prospects, of the Group Companies and (ii) it has been furnished with or given access to such documents and information about the Group Companies and their respective businesses and operations as it and its Representatives have deemed necessary to enable it to make an informed decision with respect to the execution, delivery and performance of this Agreement, the Ancillary Documents and the transactions contemplated hereby and thereby.

(b) In entering into this Agreement and the Ancillary Documents to which it is or will be a party, each SOAC Party has relied solely on its own investigation and analysis and the representations and warranties expressly set forth in Article 3 and in the Ancillary Documents to which it is or will be a party and no other representations or warranties of the Company, any Company Non-Party Affiliate or any other Person, either express or implied, and each SOAC Party, on its own behalf and on behalf of its Representatives, acknowledges, represents, warrants and agrees that, except for the representations and warranties expressly set forth in Article 3 and in the

Ancillary Documents to which it is or will be a party, none of the Company, any Company Non-Party Affiliate or any other Person makes or has made any representation or warranty, either express or implied, in connection with or related to this Agreement, the Ancillary Documents or the transactions contemplated hereby or thereby.

Section 4.18 EXCLUSIVITY OF REPRESENTATIONS AND WARRANTIES. NOTWITHSTANDING THE DELIVERY OR DISCLOSURE TO THE COMPANY OR ANY OF ITS REPRESENTATIVES OF ANY DOCUMENTATION OR OTHER INFORMATION (INCLUDING ANY FINANCIAL PROJECTIONS OR OTHER SUPPLEMENTAL DATA), EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS ARTICLE 4 OR THE ANCILLARY DOCUMENTS, NONE OF THE SOAC PARTIES, ANY SOAC NON-PARTY AFFILIATE OR ANY OTHER PERSON MAKES, AND EACH SOAC PARTY EXPRESSLY DISCLAIMS, ANY REPRESENTATIONS OR WARRANTIES OF ANY KIND OR NATURE, EXPRESS OR IMPLIED, IN CONNECTION WITH THIS AGREEMENT, THE ANCILLARY DOCUMENTS OR ANY OF THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY, INCLUDING AS TO THE MATERIALS RELATING TO THE BUSINESS AND AFFAIRS OR HOLDINGS OF ANY SOAC PARTY THAT HAVE BEEN MADE AVAILABLE TO THE COMPANY OR ANY OF ITS REPRESENTATIVES OR IN ANY PRESENTATION OF THE BUSINESS AND AFFAIRS OF ANY SOAC PARTY BY OR ON BEHALF OF THE MANAGEMENT OF ANY SOAC PARTY OR OTHERS IN CONNECTION WITH THE TRANSACTIONS CONTEMPLATED HEREBY OR BY THE ANCILLARY DOCUMENTS, AND NO STATEMENT CONTAINED IN ANY OF SUCH MATERIALS OR MADE IN ANY SUCH PRESENTATION SHALL BE DEEMED A REPRESENTATION OR WARRANTY HEREUNDER OR OTHERWISE OR DEEMED TO BE RELIED UPON BY THE COMPANY, ANY OF ITS REPRESENTATIVES OR ANY COMPANY NON-PARTY AFFILIATE IN EXECUTING, DELIVERING OR PERFORMING THIS AGREEMENT, THE ANCILLARY DOCUMENTS OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY. EXCEPT FOR THE REPRESENTATIONS AND WARRANTIES EXPRESSLY SET FORTH IN ARTICLE 4 OR THE ANCILLARY DOCUMENTS, IT IS UNDERSTOOD THAT ANY COST ESTIMATES, PROJECTIONS OR OTHER PREDICTIONS, ANY DATA, ANY FINANCIAL INFORMATION OR ANY MEMORANDA OR OFFERING MATERIALS OR PRESENTATIONS, INCLUDING ANY OFFERING MEMORANDUM OR SIMILAR MATERIALS MADE AVAILABLE BY OR ON BEHALF OF ANY SOAC PARTY ARE NOT AND SHALL NOT BE DEEMED TO BE OR TO INCLUDE REPRESENTATIONS OR WARRANTIES OF ANY SOAC PARTY, ANY SOAC NON-PARTY AFFILIATE OR ANY OTHER PERSON AND ARE NOT AND SHALL NOT BE DEEMED TO BE RELIED UPON BY THE COMPANY OR ANY OF ITS REPRESENTATIVES OR ANY COMPANY NON-PARTY AFFILIATE IN EXECUTING, DELIVERING OR PERFORMING THIS AGREEMENT, THE ANCILLARY DOCUMENTS OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY.

ARTICLE 5
COVENANTS

Section 5.1 Conduct of Business of the Company.

(a) From and after the date of this Agreement until the earlier of the Effective Time or the termination of this Agreement in accordance with its terms, the Company shall, and the Company shall cause its Subsidiaries to, except as expressly contemplated by this Agreement or any Ancillary Document (including, for the avoidance of doubt, in connection with the Preferred Share Conversion, Allseas Warrant and the Convertible Debenture Conversion), as required by applicable Law, as set forth on Section 5.1(a) of the Company Disclosure Schedules, or as consented to in writing by SOAC (such consent not to be unreasonably withheld, conditioned or delayed), (i) operate the business of the Group Companies in the ordinary course in all material respects and (ii) use reasonable best efforts to maintain and preserve intact in all material respects the business organization, assets, properties and material business relations of the Group Companies taken as a whole.

(b) Without limiting the generality of the foregoing, from and after the date of this Agreement until the earlier of the Effective Time or the termination of this Agreement in accordance with its terms, the Company shall, and the Company shall cause its Subsidiaries to, except as expressly contemplated by this Agreement or any Ancillary Document, as required by applicable Law, as set forth on Section 5.1(b) of the Company Disclosure Schedules or as consented to in writing by SOAC (such consent, other than in the case of Section 5.1(b)(i), Section 5.1(b)(ii), Section 5.1(b)(vi) (but only to the extent relating to any Material Contract of the type described in Section 3.7(a)(i), Section 3.7(a)(v), Section 3.7(a)(vi), Section 3.7(a)(x), Section 3.7(a)(xi), Section 3.7(a)(xii)(B) or Section 3.7(a)(xv) (such types of Material Contracts, collectively, the "Designated

Material Contracts")), Section 5.1(b)(vii), Section 5.1(b)(xi), Section 5.1(b)(xiii), Section 5.1(b)(xiv) or Section 5.1(b)(xv) (to the extent related to any of the foregoing), not to be unreasonably withheld, conditioned or delayed), not do any of the following:

(i) declare, set aside, make or pay a dividend on, or make any other distribution or payment in respect of, any Equity Securities of any Group Company or repurchase or redeem any outstanding Equity Securities of any Group Company, other than dividends or distributions, declared, set aside or paid by any of the Company's Subsidiaries to the Company or any Subsidiary that is, directly or indirectly, wholly owned by the Company;

(ii) (A) merge, consolidate, combine or amalgamate any Group Company with any Person or (B) purchase or otherwise acquire (whether by merging or consolidating or amalgamating with, purchasing any Equity Security in or a substantial portion of the assets of, or by any other manner) any corporation, partnership, association or other business entity or organization or division thereof;

(iii) adopt any amendments, supplements, restatements or modifications to any Group Company's Governing Documents or any Company Equity Plan;

(iv) transfer, issue, sell, grant or otherwise directly or indirectly dispose of, or subject to a Lien, (A) any Equity Securities of any Group Company or (B) any options, warrants, rights of conversion or other rights, agreements, arrangements or commitments obligating any Group Company to issue, deliver or sell any Equity Securities of any Group Company, other than, prior to the delivery of the Allocation Schedule pursuant to Section 2.4, the issuance of the Company Common Shares upon the exercise of any Company Options outstanding as of the date of this Agreement in accordance with the terms of the Company Equity Plan and the underlying grant, award or similar agreement;

(v) incur, create or assume any Indebtedness, other than ordinary course trade payables;

(vi) (A) amend, modify or terminate any Designated Material Contracts (excluding, for the avoidance of doubt, any expiration or automatic extension or renewal of any Designated Material Contract pursuant to its terms or entering into additional work or purchase orders pursuant to, and in accordance with the terms of, any Designated Material Contract), (B) waive any material benefit or right under any Designated Material Contract or (C) enter into any Contract that would constitute a Designated Material Contract;

(vii) make any loans, advances or capital contributions to, or guarantees for the benefit of, or any investments in, any Person, other than (A) intercompany loans or capital contributions between the Company and any of its wholly owned Subsidiaries and (B) the reimbursement of expenses of employees and consultants in the ordinary course of business consistent with past practice;

(viii) except as required under the terms of any Employee Benefit Plan that is set forth on the Section 3.11(a) of the Company Disclosure Schedules or except in the ordinary course of business, (A) establish, amend, modify, adopt, enter into or terminate any material Employee Benefit Plan or any other benefit or compensation plan, policy, program, or Contract that would be an Employee Benefit Plan if in effect as of the date of this Agreement, (B) materially increase or decrease any salary, bonus, benefit, incentive or any other compensation payable to any current or former director, manager, officer, employee, individual independent contractor or other service provider of any Group Company, (C) take any action to accelerate any payment, right to payment, or benefit, or the funding of any payment, right to payment or benefit, payable or to become payable to any current or former director, manager, officer, employee, individual independent contractor or other service provider of any Group Company or (D) waive or release any noncompetition, non-solicitation, no-hire, nondisclosure, noninterference, nondisparagement or other restrictive covenant obligation of any current or former director, manager, officer, employee, individual independent contractor or other service provider of any Group Company;

(ix) make an entity classification election for U.S federal income tax purposes for any of the Group Companies, enter into any Tax sharing or Tax indemnification agreement (except solely between or among Group Companies), or fail to pay any material Taxes when due (including estimated Taxes);

(x) enter into any settlement, conciliation or similar Contract the performance of which would involve the payment by the Group Companies in excess of $1,000,000, in the aggregate, or that imposes, or by its terms will impose at any point in the future, any material, non-monetary obligations on any Group Company (or SOAC or any of its Affiliates after the Closing);

(xi) authorize, recommend, propose or announce an intention to adopt, or otherwise effect, a plan of complete or partial liquidation, dissolution, restructuring, recapitalization, reorganization or similar transaction involving any Group Company;

(xii) change any Group Company's methods of accounting in any material respect, other than changes that are made in accordance with PCAOB standards;

(xiii) enter into any Contract with any broker, finder, investment banker or other Person under which such Person is or will be entitled to any brokerage fee, finders' fee or other commission in connection with the transactions contemplated by this Agreement or any Ancillary Document;

(xiv) make any Change of Control Payment that is not set forth on Section 5.1(b)(xiv) of the Company Disclosure Schedules; or

(xv) enter into any Contract to take, or cause to be taken, any of the actions set forth in this Section 5.1.

(c) The Company agrees that it shall provide reasonable notice to and consult with SOAC regarding any developments relating to any filings or reports before the ISA, including with respect to any Permits, regulations or applications related to its business. If any Group Company is required to make any filing or report with the ISA, the Company shall provide SOAC with a copy of such filing or report ten (10) days (unless a shorter time is reasonably required by the circumstances) prior to the submission of such filing or report.

Notwithstanding anything in this Section 5.1 or this Agreement to the contrary, (a) nothing set forth in this Agreement shall give SOAC, directly or indirectly, the right to control or direct the operations of the Group Companies prior to the Effective Time, (b) any action taken, or omitted to be taken, by any Group Company to the extent such act or omission is reasonably determined by the Company, based on the advice of outside legal counsel, to be necessary to comply with any Law, Order, directive, pronouncement or guideline issued by a Governmental Entity providing for business closures, "sheltering-in-place" or other restrictions that relates to, or arises out of, COVID-19 shall in no event be deemed to constitute a breach of Section 5.1 and (c) any action taken, or omitted to be taken, by any Group Company to the extent that the Company Board reasonably determines that such act or omission is necessary in response to COVID-19 to maintain and preserve in all material respects the business organization, assets, properties and material business relations of the Group Companies, taken as a whole, shall not be deemed to constitute a breach of Section 5.1; provided, however, (i) in the case of each of clause (b) and (c), the Company shall give SOAC prior written notice of any such act or omission, to the extent reasonably practicable, which notice shall describe in reasonable detail the act or omission and the reason(s) that such act or omission is being taken, or omitted to be taken, pursuant to clause (b) or (c) and, in the event that it is not reasonably practicable for the Company to give the prior written notice described in this clause (i), the Company shall instead give such written notice to SOAC promptly after such act or omission and (ii) in no event shall clause (b) or (c) be applicable to any act or omission of the type described in Section 5.1(b)(i), Section 5.1(b)(ii), Section 5.1(b)(iii), Section 5.1(b)(iv), Section 5.1(b)(v), Section 5.1(b)(vi), Section 5.1(b)(vii), Section 5.1(b)(viii), Section 5.1(b)(xi), Section 5.1(b)(xiii), Section 5.1(b)(xiv), Section 5.1(b)(xv) (to the extent related to any of the foregoing).

Section 5.2 Efforts to Consummate.

(a) Subject to the terms and conditions herein provided, each of the Parties shall use reasonable best efforts to take, or cause to be taken, all actions and to do, or cause to be done, all things reasonably necessary or advisable to consummate and make effective as promptly as reasonably practicable the transactions contemplated by this Agreement (including (i) the satisfaction, but not waiver, of the closing conditions set forth in Article 6 and, in the case of any Ancillary Document to which such Party will be a party after the date of this Agreement, to execute and deliver such Ancillary Document when required pursuant to this Agreement and (ii) using reasonable best efforts to obtain the PIPE Financing on the terms and subject to the conditions set forth in the PIPE Subscription Agreements. Without limiting the generality of the foregoing, each of the Parties shall use reasonable best efforts to obtain, file with or deliver to, as applicable, any Consents of any Governmental Entities or other Persons

necessary, proper or advisable to consummate the transactions contemplated by this Agreement or the Ancillary Documents. The Company and SOAC shall each bear 50% of the costs incurred in connection with obtaining such Consents, including the Investment Canada Act Approval (if required), and any filing fees or other costs payable to a Governmental Entity in connection the preparation, filing or mailing of the Registration Statement/Proxy Statement and any printing, mailing or similar fees or costs in connection with the preparation, filing or mailing of the Registration Statement/Proxy Statement (excluding legal fees); provided, however, that, subject to Section 9.6, each Party shall bear its out-of-pocket costs and expenses in connection with the preparation of any such Consents. Each Party shall (i) submit promptly after the date of this Agreement the application for review pursuant to Section 17 of the Investment Canada Act (only if deemed to be required or appropriate by either Party, acting reasonably) and (ii) respond as promptly as reasonably practicable to any requests by any Governmental Entity for additional information and documentary material that may be requested pursuant to the Investment Canada Act. SOAC shall promptly inform the Company of any material communication between any SOAC Party, on the one hand, and any Governmental Entity, on the other hand, and the Company shall promptly inform SOAC of any material communication between the Company, on the one hand, and any Governmental Entity, on the other hand, in either case, regarding any of the transactions contemplated by this Agreement or any Ancillary Document. Without limiting the foregoing, each Party and their respective Affiliates shall not extend any waiting period, review period or comparable period under the Investment Canada Act or enter into any agreement with any Governmental Entity not to consummate the transactions contemplated hereby or by the Ancillary Documents, except with the prior written consent of SOAC and the Company. Nothing in this Section 5.2 obligates any Party or any of its Affiliates to agree to (i) sell, license or otherwise dispose of, or hold separate and agree to sell, license or otherwise dispose of, any entities, assets or facilities of any Group Company or any entity, facility or asset of such Party or any of its Affiliates, (ii) terminate, amend or assign existing relationships and contractual rights or obligations, (iii) amend, assign or terminate existing licenses or other agreements, or (iv) enter into new licenses or other agreements. No Party shall agree to any of the foregoing measures with respect to any other Party or any of its Affiliates, except with SOAC's and the Company's prior written consent. Notwithstanding the foregoing, the Parties agree to offer commercially reasonable and customary undertakings as may reasonably be required to obtain Investment Canada Act Approval (only if such approval is deemed to be required or appropriate by either Party, acting reasonably). For greater certainty, SOAC will not offer any undertakings to obtain Investment Canada Act Approval without the consent of the Company, such consent not to be unreasonably withheld, conditioned or delayed.

(b) From and after the date of this Agreement until the earlier of the Effective Time or termination of this Agreement in accordance with its terms, the SOAC Parties, on the one hand, and the Company, on the other hand, shall give counsel for the Company (in the case of any SOAC Party) or SOAC (in the case of the Company), a reasonable opportunity to review in advance, and consider in good faith the views of the other in connection with, any proposed written communication to any Governmental Entity relating to the transactions contemplated by this Agreement or the Ancillary Documents. Each of the Parties agrees not to participate in any substantive meeting or discussion, either in person or by telephone with any Governmental Entity in connection with the transactions contemplated by this Agreement unless it consults with, in the case of any SOAC Party, the Company, or, in the case of the Company, SOAC in advance and, to the extent not prohibited by such Governmental Entity, gives, in the case of any SOAC Party, the Company, or, in the case of the Company, SOAC, the opportunity to attend and participate in such meeting or discussion.

(c) Notwithstanding anything to the contrary in the Agreement, in the event that this Section 5.2 conflicts with any other covenant or agreement in this Article 5 that is intended to specifically address any subject matter, then such other covenant or agreement shall govern and control solely to the extent of such conflict.

(d) From and after the date of this Agreement until the earlier of the Effective Time or termination of this Agreement in accordance with its terms, SOAC, on the one hand, and the Company, on the other hand, shall each notify the other in writing promptly after learning of any shareholder demands or other shareholder Proceedings (including derivative claims and Arrangement Dissent Rights) relating to this Agreement, any Ancillary Document or any matters relating thereto (collectively, the "Transaction Litigation") commenced against, in the case of SOAC, SOAC or any of its Representatives (in their capacity as a representative of SOAC) or, in the case of the Company, any Group Company or any of their respective Representatives (in their capacity as a representative of a Group Company). Subject and in addition to Section 2.1(b)(ii) with respect to Arrangement Dissent Rights, SOAC and the Company shall each (i) keep the other reasonably informed regarding any Transaction Litigation, (ii) give the other the opportunity to, at its own cost and expense, participate in the defense, settlement and compromise of any such Transaction Litigation and reasonably cooperate with the other in connection with the defense, settlement

and compromise of any such Transaction Litigation, (iii) consider in good faith the other's advice with respect to any such Transaction Litigation, (iv) reasonably cooperate with each other and (v) refrain from settling or compromising any Transaction Litigation without the prior written consent of SOAC or the Company, as applicable (not to be unreasonably withheld, conditioned or delayed).

Section 5.3 Confidentiality and Access to Information.

(a) The Parties hereby acknowledge and agree that the information having been and being provided in connection with this Agreement and the consummation of the transactions contemplated hereby is subject to the terms of the Confidentiality Agreement, the terms of which are incorporated herein by reference. Notwithstanding the foregoing or anything to the contrary in this Agreement, in the event that this Section 5.3(a) or the Confidentiality Agreement conflicts with any other covenant or agreement contained in this Agreement or any Ancillary Document that contemplates the disclosure, use or provision of information or otherwise, then such other covenant or agreement contained in this Agreement or such Ancillary Document, as applicable, shall govern and control to the extent of such conflict.

(b) From and after the date of this Agreement until the earlier of the Effective Time or the termination of this Agreement in accordance with its terms, upon reasonable advance written notice, the Company shall provide, or cause to be provided, to SOAC and its Representatives during normal business hours reasonable access to the directors, officers, books and records and properties of the Group Companies (in a manner so as to not interfere with the normal business operations of the Group Companies). Notwithstanding the foregoing, none of the Group Companies shall be required to provide to SOAC or any of its Representatives any information (i) if and to the extent doing so would (A) violate any Law to which any Group Company is subject, including any Privacy Law, (B) result in the disclosure of any trade secrets of third parties in breach of any Contract with such third party, (C) violate any legally-binding obligation of any Group Company with respect to confidentiality, non-disclosure or privacy or (D) jeopardize protections afforded to any Group Company under the attorney-client privilege or the attorney work product doctrine (provided that, in case of each of clauses (A) through (D), the Company shall, and shall cause the other Group Companies to, use commercially reasonable efforts to (x) provide such access as can be provided (or otherwise convey such information regarding the applicable matter as can be conveyed) without violating such privilege, doctrine, Contract, obligation or Law and (y) provide such information in a manner without violating such privilege, doctrine, Contract, obligation or Law), or (ii) if any Group Company, on the one hand, and any SOAC Party, any SOAC Non-Party Affiliates or any of their respective Representatives, on the other hand, are adverse parties in a litigation and such information is reasonably pertinent thereto; provided that the Company shall, in the case of clause (i) or (ii), provide prompt written notice of the withholding of access or information on any such basis unless such written notice is prohibited by applicable Law.

(c) From and after the date of this Agreement until the earlier of the Effective Time or the termination of this Agreement in accordance with its terms, upon reasonable advance written notice, SOAC shall provide, or cause to be provided, to the Company and its Representatives during normal business hours reasonable access to the directors, officers, books and records of the SOAC Parties (in a manner so as to not interfere with the normal business operations of the SOAC Parties). Notwithstanding the foregoing, SOAC shall not be required to provide, or cause to be provided to, the Company or any of its Representatives any information (i) if and to the extent doing so would (A) violate any Law to which any SOAC Party is subject, (B) result in the disclosure of any trade secrets of third parties in breach of any Contract with such third party, (C) violate any legally-binding obligation of any SOAC Party with respect to confidentiality, non-disclosure or privacy or (D) jeopardize protections afforded to any SOAC Party under the attorney-client privilege or the attorney work product doctrine (provided that, in case of each of clauses (A) through (D), SOAC shall use, and shall cause the other SOAC Parties to use, commercially reasonable efforts to (x) provide such access as can be provided (or otherwise convey such information regarding the applicable matter as can be conveyed) without violating such privilege, doctrine, Contract, obligation or Law and (y) provide such information in a manner without violating such privilege, doctrine, Contract, obligation or Law), or (ii) if a SOAC Party or the Sponsor or any of their respective Representatives, on the one hand, and any Group Company, any Company Non-Party Affiliate or any of their respective Representatives, on the other hand, are adverse parties in a litigation and such information is reasonably pertinent thereto; provided that SOAC shall, in the case of clause (i) or (ii), provide prompt written notice of the withholding of access or information on any such basis unless such written notice is prohibited by applicable Law.

Section 5.4 Public Announcements.

(a) Subject to Section 5.4(b), Section 5.7 and Section 5.8, none of the Parties or any of their respective Representatives shall issue any press releases or make any public announcements with respect to this Agreement or the transactions contemplated hereby without the prior written consent of, prior to the Closing, the Company and SOAC or, after the Closing, SOAC; provided, however, that each Party and their respective Representatives may issue or make, as applicable, any such press release, public announcement or other communication (i) if such press release, public announcement or other communication is required by applicable Law, in which case (A) prior to the Closing, the disclosing Party or its applicable Representatives shall, unless and to the extent prohibited by such applicable Law, (x) if the disclosing Person is a SOAC Party or a Representative of a SOAC Party, reasonably consult with the Company in connection therewith and provide the Company with an opportunity to review and comment on such press release, public announcement or communication and shall consider any such comments in good faith, or (y) if the disclosing Party is the Company or a Representative of the Company, reasonably consult with SOAC in connection therewith and provide SOAC with an opportunity to review and comment on such press release, public announcement or communication and shall consider any such comments in good faith, or (B) after the Closing, the disclosing Party and its Representatives shall use reasonable best efforts to consult with SOAC and the disclosing Party shall consider such comments in good faith, (ii) to the extent such announcements or other communications contain only information previously disclosed in a public statement, press release or other communication previously approved in accordance with this Section 5.4 and (iii) to Governmental Entities in connection with any Consents required to be made under this Agreement, the Ancillary Documents or in connection with the transactions contemplated hereby or thereby.

(b) The initial press release concerning this Agreement and the transactions contemplated hereby shall be a joint press release in the form agreed by the Company and SOAC prior to the execution of this Agreement and such initial press release (the "Signing Press Release") shall be released as promptly as reasonably practicable after the execution of this Agreement within one (1) Business Day of the day thereof. Promptly after the execution of this Agreement, SOAC shall file a current report on Form 8-K (the "Signing Filing") with the Signing Press Release and a description of this Agreement as required by, and in compliance with, the Securities Laws, which the Company shall have the opportunity to review and comment upon prior to filing and SOAC shall consider such comments in good faith. The Company, on the one hand, and SOAC, on the other hand, shall mutually agree upon (such agreement not to be unreasonably withheld, conditioned or delayed by either the Company or SOAC, as applicable) a press release announcing the consummation of the transactions contemplated by this Agreement (the "Closing Press Release") prior to the Closing, and, on the Closing Date (or such other date as may be mutually agreed to in writing by SOAC and the Company prior to the Closing), the Parties shall cause the Closing Press Release to be released. Promptly after the Closing (but in any event within four (4) Business Days after the Closing), SOAC shall file a current report on Form 8-K (the "Closing Filing") with the Closing Press Release and a description of the Closing as required by Securities Laws, which Closing Filing shall be mutually agreed upon by the Company and SOAC prior to the Closing (such agreement not to be unreasonably withheld, conditioned or delayed by either the Company or SOAC, as applicable). In connection with the preparation of each of the Signing Press Release, the Signing Filing, the Closing Press Release and the Closing Filing, each Party shall, upon written request by any other Party, furnish such other Party with all information concerning itself, its directors, officers and equityholders, and such other matters as may be reasonably necessary for such press release or filing.

Section 5.5 Tax Matters.

(a) Tax Treatment.

(i) The Parties intend that for U.S. federal income Tax purposes (A) the SOAC Continuance shall constitute a transaction treated as a "reorganization" within the meaning of Section 368(a)(1)(F) of the Code and (B) the Share Exchange and Amalgamation, viewed together, shall constitute a transaction treated as a "reorganization" within the meaning of Section 368(a) of the Code, and each Party shall, and shall cause its respective Affiliates to, use reasonable best efforts to cause the SOAC Continuance and the Transactions to so qualify and shall file all Tax Returns consistent with, and take no position inconsistent with (whether in audits, Tax Returns or otherwise), such treatment unless required to do so pursuant to a "determination" that is final within the meaning of Section 1313(a) of the Code.

(ii) SOAC and the Company hereby adopt this Agreement as a "plan of reorganization" within the meaning of Treasury Regulations Sections 1.368-2(g) and 1.368-3(a). The Parties shall not take any action, or knowingly fail to take any action, which action or failure to act prevents or impedes, or would reasonably be expected to prevent or impede, the Intended Tax Treatment.

(iii) A check-the-box election shall be made for the Surviving Company to treat the Surviving Company as a disregarded entity of SOAC for U.S. federal income Tax purposes.

(b) If, in connection with the preparation and filing of the Registration Statement/Proxy Statement, the SEC requests or requires that tax opinions be prepared and submitted in such connection, SOAC and the Company shall deliver to Kirkland & Ellis LLP and Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. and/or PricewaterhouseCoopers LLP, respectively, customary Tax representation letters satisfactory to its counsel, dated and executed as of the date the Registration Statement/Proxy Statement shall have been declared effective by the SEC and such other date(s) as determined reasonably necessary by such counsel in connection with the preparation and filing of the Registration Statement/Proxy Statement, and, if required, Kirkland & Ellis LLP shall furnish an opinion, subject to customary assumptions and limitations, to the effect that the Intended Tax Treatment should apply to the SOAC Continuance and, if required, Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. and/or PricewaterhouseCoopers LLP shall furnish an opinion, subject to customary assumptions and limitations, to the effect that the Intended Tax Treatment should apply to the Share Exchange and Amalgamation.

(c) Subject to the provisions of the Plan of Arrangement, SOAC shall execute joint tax elections under subsections 85(1) or (2) of the Tax Act or any equivalent provincial legislation with Company Shareholders who are Eligible Holders (as defined in the Plan of Arrangement) and who receive Exchange Consideration under the Arrangement, subject to and in accordance with the Plan of Arrangement.

(d) Tax Matters Cooperation. Each of the Parties shall (and shall cause their respective Affiliates to) cooperate fully, as and to the extent reasonably requested by another Party, in connection with the filing of relevant Tax Returns, and any audit or tax proceeding. Such cooperation shall include the retention and (upon the other Party's request) the provision (with the right to make copies) of records and information reasonably relevant to any tax proceeding or audit, making employees available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder and making available to the Pre-Closing SOAC Shareholders information reasonably necessary to compute any income of any such holder (or its direct or indirect owners) arising (i) if applicable, as a result of SOAC's status as a "passive foreign investment company" (a "PFIC") within the meaning of Section 1297(a) of the Code or a "controlled foreign corporation" within the meaning of Section 957(a) of the Code for any taxable period that includes the Closing Date, including timely providing (A) a PFIC Annual Information Statement to enable such holders to make a "Qualifying Electing Fund" election under Section 1295 of the Code for such taxable period, and (B) information to enable applicable holders to report their allocable share of "subpart F" income under Section 951 of the Code for such taxable period and (ii) under Section 367(b) of the Code and the Treasury Regulations promulgated thereunder as a result of the Transactions.

(e) PFIC Reporting. Following the Closing Date, at the end of each taxable year of SOAC, SOAC shall use commercially reasonable efforts to (i) make a determination as to whether SOAC or any Subsidiary thereof is PFIC within the meaning of Section 1297 of the Code for such taxable year and (ii) if it is determined that SOAC or any such Subsidiary is a PFIC for any such taxable year, make available to SOAC's shareholders a PFIC Annual Information Statement to enable such shareholders to make a "Qualifying Electing Fund" election under Section 1295 for such taxable year.

Section 5.6 Exclusive Dealing.

(a) From the date of this Agreement until the earlier of the Effective Time or the termination of this Agreement in accordance with its terms, the Company shall not, and shall cause the other Group Companies and its and their respective Representatives not to, directly or indirectly: (i) solicit, initiate, knowingly encourage (including by means of furnishing or disclosing information), knowingly facilitate, discuss or negotiate, directly or indirectly, any inquiry, proposal or offer (written or oral) with respect to a Company Acquisition Proposal; (ii) furnish or disclose any non-public information to any Person in connection with, or that could reasonably be expected to lead to, a Company Acquisition Proposal; (iii) enter into any Contract or other arrangement or understanding regarding a Company Acquisition Proposal; (iv) prepare or take any steps in connection with a public offering of any Equity Securities of any Group Company (or any Affiliate or successor of any Group Company); or (v) otherwise cooperate

in any way with, or assist or participate in, or knowingly facilitate or knowingly encourage any effort or attempt by any Person to do or seek to do any of the foregoing. The Company agrees to (A) notify SOAC promptly upon receipt of any Company Acquisition Proposal by any Group Company, and to describe the material terms and conditions of any such Company Acquisition Proposal in reasonable detail (including the identity of the Persons making such Company Acquisition Proposal) and (B) keep SOAC reasonably informed on a current basis of any modifications to such offer or information.

(b) From the date of this Agreement until the earlier of the Closing or the termination of this Agreement in accordance with its terms, the SOAC Parties shall not, and each of them shall cause its Representatives not to, directly or indirectly: (i) knowingly solicit, initiate, encourage (including by means of furnishing or disclosing information), knowingly facilitate, discuss or negotiate, directly or indirectly, any inquiry, proposal or offer (written or oral) with respect to a SOAC Acquisition Proposal; (ii) furnish or disclose any non-public information to any Person in connection with, or that could reasonably be expected to lead to, a SOAC Acquisition Proposal; (iii) enter into any Contract or other arrangement or understanding regarding a SOAC Acquisition Proposal; or (iv) otherwise cooperate in any way with, or assist or participate in, or knowingly facilitate or knowingly encourage any effort or attempt by any Person to do or seek to do any of the foregoing. SOAC agrees to (A) notify the Company promptly upon receipt of any SOAC Acquisition Proposal by any SOAC Party, and to describe the material terms and conditions of any such SOAC Acquisition Proposal in reasonable detail (including the identity of any person or entity making such SOAC Acquisition Proposal) and (B) keep the Company reasonably informed on a current basis of any modifications to such offer or information.

For the avoidance of doubt, it is understood and agreed that the covenants and agreements contained in this Section 5.6 shall not prohibit the Company, any SOAC Party or any of their respective Representatives from taking any actions in the ordinary course that are not otherwise in violation of this Section 5.6 (such as answering phone calls) or informing any Person inquiring about a possible Company Acquisition Proposal or SOAC Acquisition Proposal, as applicable, of the existence of the covenants and agreements contained in this Section 5.6.

Section 5.7 Preparation of Registration Statement/Proxy Statement.

(a) As promptly as reasonably practicable following the date of this Agreement, SOAC and the Company shall prepare and mutually agree upon (such agreement not to be unreasonably withheld, conditioned or delayed by either of SOAC or the Company, as applicable), and SOAC shall file with the SEC, the Registration Statement/Proxy Statement (it being understood that the Registration Statement/Proxy Statement shall include a proxy statement/prospectus of SOAC which will be included therein and which will be used for the SOAC Shareholders Meeting to adopt and approve the Transaction Proposals and other matters reasonably related to the Transaction Proposals, all in accordance with and as required by SOAC's Governing Documents, applicable Law, and any applicable rules and regulations of the SEC and NYSE). Each of SOAC and the Company shall use its reasonable best efforts to (a) cause the Registration Statement/Proxy Statement to comply in all material respects with the applicable rules and regulations promulgated by the SEC (including, with respect to the Group Companies, the provision of financial statements of, and any other information with respect to, the Group Companies for all periods, and in the form, required to be included in the Registration Statement/Proxy Statement under Securities Laws (after giving effect to any waivers received) or in response to any comments from the SEC); (b) promptly notify the others of, reasonably cooperate with each other with respect to and respond promptly to any comments of the SEC or its staff; (c) have the Registration Statement/Proxy Statement declared effective under the Securities Act as promptly as reasonably practicable after it is filed with the SEC; and (d) keep the Registration Statement/Proxy Statement effective through the Closing in order to permit the consummation of the transactions contemplated by this Agreement. SOAC, on the one hand, and the Company, on the other hand, shall promptly furnish, or cause to be furnished, to the other all information concerning such Party, its Non-Party Affiliates and their respective Representatives that may be required or reasonably requested in connection with any action contemplated by this Section 5.7 or for inclusion in any other statement, filing, notice or application made by or on behalf of SOAC to the SEC or NYSE in connection with the transactions contemplated by this Agreement or the Ancillary Documents, including delivering customary tax representation letters to counsel to enable counsel to deliver any tax opinions requested or required by the SEC to be submitted in connection therewith as described in Section 5.5(b). If any Party becomes aware of any information that should be disclosed in an amendment or supplement to the Registration Statement/Proxy Statement, then (i) such Party shall promptly inform, in the case of any SOAC Party, the Company, or, in the case of the Company, SOAC, thereof; (ii) such Party shall prepare and mutually agree upon with, in the case of SOAC, the Company, or, in the case of the Company, SOAC (in either case, such agreement not to be

unreasonably withheld, conditioned or delayed), an amendment or supplement to the Registration Statement/Proxy Statement; (iii) SOAC shall file such mutually agreed upon amendment or supplement with the SEC; and (iv) the Parties shall reasonably cooperate, if appropriate, in mailing such amendment or supplement to the Pre-Closing SOAC Shareholders. SOAC shall as promptly as reasonably practicable advise the Company of the time of effectiveness of the Registration Statement/Proxy Statement, the issuance of any stop order relating thereto or the suspension of the qualification of SOAC Common Shares for offering or sale in any jurisdiction, and SOAC and the Company shall each use its reasonable best efforts to have any such stop order or suspension lifted, reversed or otherwise terminated. Each of the Parties shall use reasonable best efforts to ensure that none of the information related to him, her or it or any of his, her or its Non-Party Affiliates or its or their respective Representatives, supplied by or on his, her or its behalf for inclusion or incorporation by reference in the Registration Statement/Proxy Statement will, at the time the Registration Statement/Proxy Statement is initially filed with the SEC, at each time at which it is amended, or at the time it becomes effective under the Securities Act contain any Misrepresentation. From and after the date of this Agreement until the earlier of the Closing or termination of this Agreement in accordance with its terms, the SOAC Parties, on the one hand, and the Company, on the other hand, shall give counsel for the Company (in the case of any SOAC Party) or SOAC (in the case of the Company), a reasonable opportunity to review in advance, and consider in good faith the views of the other in connection with, any proposed written communication to the SEC or the NYSE relating to the transactions contemplated by this Agreement or the Ancillary Documents. Each of the Parties agrees not to participate in any substantive meeting or discussion, either in person or by telephone with the SEC or the NYSE in connection with the transactions contemplated by this Agreement unless it consults with, in the case of any SOAC Party, the Company, or, in the case of the Company, SOAC in advance and, to the extent not prohibited by the SEC or the NYSE, gives, in the case of any SOAC Party, the Company, or, in the case of the Company, SOAC, the opportunity to attend and participate in such meeting or discussion.

(b) As promptly as reasonably practicable following the date of this Agreement, SOAC and the Company shall reasonably determine, based on (i) total number of Canadian residents participating in the PIPE Financing and anticipated to be Company Shareholders as at the Effective Time, in each case, directly or indirectly (collectively, the "SOAC Canadian Shareholders"), and (ii) the factors described in Section 1.15 of Companion Policy 45-102 *Resale of Securities* (British Columbia) (the "Policy") whether the resale by SOAC Canadian Shareholders of SOAC Shares after the Effective Time would reasonably be expected to be exempted from the prospectus requirements pursuant to the exemption set forth in Section 2.14 of National Instrument 45-102 — *Resale of Securities* (British Columbia) (the "10% Exemption"). Without limiting the generality of the foregoing, SOAC and the Company shall each use reasonable efforts to ascertain the information with respect to its securityholders required by the Policy insofar as it relates to the 10% Exemption. If the Parties reasonably determine that the 10% Exemption will not be available to the SOAC Canadian Shareholders, then, as promptly as reasonably practicable thereafter, SOAC and the Company shall prepare and mutually agree upon (such agreement not to be unreasonably withheld, conditioned or delayed by either of SOAC or the Company, as applicable), and SOAC shall file with the British Columbia Securities Commission, a preliminary and final non-offering prospectus (the "Non-Offering Prospectus") in sufficient time for SOAC to become a reporting issuer in the Province of British Columbia immediately after the Effective Time. The Non-Offering Prospectus shall be comprised of the prospectus forming part of the Registration Statement/Proxy Statement, and supplemented by the required disclosure under applicable Canadian securities laws, including, as applicable, the required financial statements of the Company for the year ended December 31, 2018. The rights and obligations of the Parties under Section 5.17(a) regarding the Registration Statement/Proxy Statement shall apply to the Non-Offering Prospectus, *mutatis mutandis*, and Section 3.22, Section 4.5 and Section 5.2 shall be deemed to refer to the Registration Statement/Proxy Statement and the Non-Offering Prospectus.

Section 5.8 SOAC Shareholder Approval. As promptly as reasonably practicable following the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, SOAC shall (x) duly give notice of and (y) use reasonable best efforts to duly convene and hold a meeting of its shareholders (the "SOAC Shareholders Meeting") in accordance with the Governing Documents of SOAC, for the purposes of obtaining the SOAC Shareholder Approval and, if applicable, any approvals related thereto and providing its shareholders with the opportunity to elect to effect a SOAC Shareholder Redemption. SOAC shall (i) through the SOAC Board, recommend to its shareholders (the "SOAC Board Recommendation"), (A) the adoption and approval of this Agreement and the transactions contemplated hereby (including the Transactions) (the "Business Combination Proposal"); (B) the adoption and the approval of the SOAC Continuance (the "SOAC Continuance Proposal"); (C) the approval of the issuance of the Exchange Consideration, the Sponsor Earnout Shares and

the Vesting Sponsor Shares in connection with the transactions contemplated by this Agreement as required by NYSE listing requirements (the "NYSE Proposal"); (D) the adoption and approval of the SOAC Articles and SOAC Notice of Articles (the "Required Governing Document Proposal"); (E) the adoption and approval of certain differences between the Pre-Closing SOAC Governing Documents and the proposed SOAC Articles and the proposed SOAC Notice of Articles; (F) the adoption and approval of the SOAC Incentive Equity Plan; (G) the adoption and approval of each other proposal that either the SEC or NYSE (or the respective staff members thereof) indicates is necessary in its comments to the Registration Statement/Proxy Statement or in correspondence related thereto; (H) the adoption and approval of each other proposal reasonably agreed to by SOAC and the Company as necessary or appropriate in connection with the consummation of the transactions contemplated by this Agreement or the Ancillary Documents; and (I) the adoption and approval of a proposal for the adjournment of the SOAC Shareholders Meeting, if necessary, to permit further solicitation of proxies because there are not sufficient votes to approve and adopt any of the foregoing (such proposals in (A) through (I) collectively, the "Transaction Proposals"), and (ii) include such recommendation contemplated by clause (i) in the Registration Statement/Proxy Statement. Notwithstanding the foregoing or anything to the contrary herein, SOAC may adjourn the SOAC Shareholders Meeting (A) to solicit additional proxies for the purpose of obtaining the SOAC Shareholder Approval, (B) for the absence of a quorum, (C) to allow reasonable additional time for the filing or mailing of any supplemental or amended disclosures that SOAC has determined, based on the advice of outside legal counsel, is reasonably likely to be required under applicable Law and for such supplemental or amended disclosure to be disseminated and reviewed by the Pre-Closing SOAC Shareholders prior to the SOAC Shareholders Meeting or (D) if the holders of SOAC Class A Shares have elected to redeem a number of Class A Shares as of such time that would reasonably be expected to result in the condition set forth in Section 6.3(b) not being satisfied; provided that, without the consent of the Company, in no event shall SOAC adjourn the SOAC Shareholders Meeting for more than fifteen (15) Business Days later than the most recently adjourned meeting or to a date that is beyond the Termination Date. Except as otherwise required by applicable Law, SOAC covenants that none of the SOAC Board or SOAC nor any committee of the SOAC Board shall withdraw or modify, or propose publicly or by formal action of the SOAC Board, any committee of the SOAC Board or SOAC to withdraw or modify, in a manner adverse to the Company, the SOAC Board Recommendation or any other recommendation by the SOAC Board or SOAC of the proposals set forth in the Registration Statement/Proxy Statement.

Section 5.9 Conduct of Business of SOAC. From and after the date of this Agreement until the earlier of the Effective Time or the termination of this Agreement in accordance with its terms, SOAC shall not, and shall cause its Subsidiaries not to, as applicable, except as expressly contemplated by this Agreement or any Ancillary Document (including, for the avoidance of doubt, in connection with the SOAC Continuance or the PIPE Financing), as required by applicable Law, as set forth on Section 5.9 of the SOAC Disclosure Schedules or as consented to in writing by the Company, do any of the following:

(a) adopt any amendments, supplements, restatements or modifications to the Trust Agreement, Warrant Agreement or the Governing Documents of any SOAC Party or any of its Subsidiaries;

(b) declare, set aside, make or pay a dividend on, or make any other distribution or payment in respect of, any Equity Securities of SOAC or any of its Subsidiaries, or repurchase, redeem or otherwise acquire, or offer to repurchase, redeem or otherwise acquire, any outstanding Equity Securities of SOAC or any of its Subsidiaries;

(c) split, combine, reclassify, subdivide or consolidate any of its Equity Securities or issue any other security in respect of, in lieu of or in substitution for its Equity Securities;

(d) incur, create or assume any Indebtedness or guarantee any Liability of any Person (other than any SOAC Party);

(e) make any loans or advances to, or capital contributions in, any other Person, other than to, or in, SOAC or any of its Subsidiaries;

(f) issue any Equity Securities of SOAC or any of its Subsidiaries or grant any additional options, warrants or stock appreciation rights with respect to Equity Securities of SOAC or any of its Subsidiaries;

(g) (i) amend, modify or renew any SOAC Related Party Transaction, other than (A) the entry into any Contract with a SOAC Related Party with respect to the incurrence of Indebtedness permitted by Section 5.9(d)

or (b) for the avoidance of doubt, any expiration or automatic extension or renewal of any Contract pursuant to its terms, or (ii) enter into any Contract that if entered into prior to the execution and delivery of this Agreement would constitute a SOAC Related Party Transaction;

(h) engage in any activities or business, or incur any material SOAC Liabilities, other than any activities, businesses or SOAC Liabilities that are either permitted under this Section 5.9 (including, for the avoidance of doubt, any activities, businesses or SOAC Liabilities contemplated by, incurred in connection with or that are otherwise incidental or attendant to this Agreement or any Ancillary Document, the performance of any covenants or agreements hereunder or thereunder or the consummation of the transactions contemplated hereby or thereby) or in accordance with this Section 5.9;

(i) authorize, recommend, propose or announce an intention to adopt a plan of complete or partial liquidation or dissolution;

(j) make, change or revoke any material election concerning Taxes, enter into any material Tax closing agreement, settle any material Tax claim or assessment, or consent to any extension or waiver of the limitation period applicable to or relating to any material Tax claim or assessment, other than any such extension or waiver that is obtained in the ordinary course of business;

(k) enter into any Contract with any broker, finder, investment banker or other Person under which such Person is or will be entitled to any brokerage fee, finders' fee or other commission in connection with the transactions contemplated by this Agreement; or

(l) enter into any Contract to take, or cause to be taken, any of the actions set forth in this Section 5.9.

Notwithstanding anything in this Section 5.9 or this Agreement to the contrary, nothing set forth in this Agreement shall give the Company, directly or indirectly, the right to control or direct the operations of any SOAC Party prior to the Closing.

Section 5.10 Stock Exchange Listing. SOAC shall use its reasonable best efforts to (a) cause the SOAC Common Shares issuable in accordance with this Agreement to be approved for listing on NYSE, subject to official notice of issuance thereof, and (b) to satisfy any applicable initial and continuing listing requirements of NYSE, in each case as promptly as reasonably practicable after the date of this Agreement, and in any event prior to the Effective Time; provided, however, notwithstanding the foregoing, SOAC may, after notice to, and in good faith consultation with, the Company, elect to seek approval for listing such SOAC Common Shares on Nasdaq instead of NYSE and upon such election and approval by Nasdaq, any reference to NYSE in this Agreement or any Ancillary Document shall be deemed to refer to Nasdaq, as the context so requires. The Company shall, and shall cause its Representatives to, reasonably cooperate with SOAC and its Representatives in connection with the foregoing.

Section 5.11 Trust Account. Upon satisfaction or, to the extent permitted by applicable Law, waiver of the conditions set forth in Article 6 and provision of notice thereof to the Trustee, (a) at the Closing, SOAC shall (i) cause the documents, certificates and notices required to be delivered to the Trustee pursuant to the Trust Agreement to be so delivered, and (ii) make all appropriate arrangements to cause the Trustee to (A) pay as and when due all amounts, if any, payable to the Public Shareholders of SOAC pursuant to the SOAC Shareholder Redemption, (B) pay the amounts due to the underwriters of SOAC's initial public offering for their deferred underwriting commissions as set forth in the Trust Agreement and (C) immediately thereafter, pay all remaining amounts then available in the Trust Account to SOAC in accordance with the Trust Agreement, and (b) thereafter, the Trust Account shall terminate, except as otherwise provided therein.

Section 5.12 Company Shareholder Approval; PIPE Subscription Agreements; Registration Rights Agreements.

(a) The Company, through the Company Board, shall not (i) withdraw, amend, modify or, in a manner adverse to SOAC, qualify, or publicly propose or state an intention to withdraw, amend, modify or, in a manner adverse to SOAC, qualify, the recommendation referred to in Section 2.1(c)(iii) that the Company Shareholders vote in favor of the Company Arrangement Resolution, (ii) accept, approve, endorse or recommend, or publicly propose to accept, approve, endorse or recommend a Company Acquisition Proposal or take no position or remains neutral with respect to a publicly announced, or otherwise publicly disclosed, Company Acquisition

Proposal for more than five (5) Business Days (or beyond the third (3rd) Business Day prior to the date of the Company Shareholders Meeting, if sooner); or (iii) approve, endorse, recommend or authorize the Company to enter into a Contract concerning a Company Acquisition Proposal.

(b) SOAC may not terminate, modify or waive or consent to the termination, modification or waiver of any provisions of any PIPE Subscription Agreement or the Sponsor Letter Agreement without the prior written consent of the Company; provided that any modification or waiver that is solely ministerial in nature or otherwise immaterial and does not affect any economic or any other material term of any PIPE Subscription Agreement shall not require the prior written consent of the Company.

(c) Prior to the Closing, the Company shall approach each Company Shareholder that is likely to hold in excess of one percent (1%) of the outstanding Company Shares (on an as converted to Common Shares basis) immediately prior to the Effective Time, and request that such Company Shareholder execute the Registration Rights Agreements prior to and in connection with the Closing in accordance with such Company Shareholder's obligation under its Transaction Support Agreement, as applicable. Subject to applicable Law, the Company will provide such background and information reasonably requested by such Company Shareholders in connection with the Registration Rights Agreement, and recommend to such Company Shareholders to execute the Registration Rights Agreement.

Section 5.13 SOAC Indemnification; Directors' and Officers' Insurance.

(a) Following the SOAC Continuance, the SOAC Articles shall, subject to the provisions of the BCBCA, contain provisions no less favorable with respect to indemnification, exculpation, advancement or expense reimbursement than are set forth in the Governing Documents of SOAC prior to the SOAC Continuance, which provisions shall not thereafter be amended, repealed or otherwise modified in any manner that would affect adversely the rights thereunder of individuals who, at or prior to the Effective Time, were directors, officers, employees, fiduciaries or agents of SOAC, unless such modification shall be required by applicable Law.

(b) Each Party agrees that (i) all rights to indemnification or exculpation now existing in favor of the directors and officers of each SOAC Party, as provided for under applicable Law, in the applicable SOAC Party's Governing Documents or under indemnification agreements in effect as of immediately prior to the Effective Time, in either case, solely with respect to any matters occurring on or prior to the Effective Time, shall survive the transactions contemplated by this Agreement and shall continue in full force and effect from and after the Effective Time for a period of six (6) years and (ii) SOAC will perform and discharge, or cause to be performed and discharged, all obligations to provide such indemnity and exculpation during such six (6)-year period. To the maximum extent permitted by applicable Law, during such six (6)-year period, SOAC shall advance, or caused to be advanced, expenses in connection with such indemnification as provided in the applicable SOAC Party's Governing Documents or other applicable agreements as in effect immediately prior to the Effective Time. The indemnification and liability limitation or exculpation provisions of the SOAC Parties' Governing Documents or indemnification agreements shall not, during such six (6)-year period, be amended, repealed or otherwise modified following the Effective Time in any manner that would materially and adversely affect the rights thereunder of individuals who, as of immediately prior to the Effective Time, or at any time prior to such time, were directors or officers of any SOAC Party (the "SOAC D&O Persons") entitled to be so indemnified, have their liability limited or be exculpated with respect to any matters occurring on or prior to the Effective Time and relating to the fact that such SOAC D&O Person was a director or officer of any SOAC Party on or prior to the Effective Time, unless such amendment, repeal or other modification is required by applicable Law.

(c) SOAC shall not have any obligation under this Section 5.13 to any SOAC D&O Person when and if a court of competent jurisdiction shall ultimately determine (and such determination shall have become final and non-appealable) that the indemnification of such SOAC D&O Person in the manner contemplated hereby is prohibited by applicable Law.

(d) SOAC shall purchase, at or prior to the Closing, and SOAC shall maintain, or cause to be maintained, in effect for a period of six (6) years following the Effective Time, without any lapses in coverage, a "tail" policy providing directors' and officers' liability insurance coverage for the benefit of those Persons who are currently covered by any comparable insurance policies of the SOAC Parties in effect as of the date of this Agreement with respect to matters occurring on or prior to the Effective Time. Such "tail" policy shall provide coverage on terms (with respect to coverage and amount) that are substantially the same as (and no less favorable

in the aggregate to the Persons covered thereby than) the coverage provided under SOAC's directors' and officers' liability insurance policies in effect as of the date of this Agreement; provided that SOAC shall not be obligated to pay a premium for such "tail" policy in excess of three hundred percent (300%) of the most recent annual premium paid by SOAC prior to the date of this Agreement and, in such event, SOAC shall purchase the maximum coverage available for three hundred percent (300%) of the most recent annual premium paid by SOAC prior to the date of this Agreement.

(e) If SOAC or any of its successors or assigns (i) shall merge, amalgamate or consolidate with or merge, amalgamate or be liquidated into any other corporation or entity and shall not be the surviving or continuing corporation or entity of such consolidation, amalgamation or merger or (ii) shall transfer all or substantially all of their respective properties and assets as an entity in one or a series of related transactions to any Person, then in each such case, proper provisions shall be made so that the successors or assigns of SOAC shall assume all of the obligations set forth in this this Section 5.13.

(f) The Persons entitled to the indemnification, liability limitation, exculpation or insurance coverage set forth in this Section 5.13 are intended to be third-party beneficiaries of this Section 5.13. This Section 5.13 shall survive the consummation of the transactions contemplated by this Agreement and shall be binding on all successors and assigns of SOAC.

Section 5.14 Company Indemnification; Directors' and Officers' Insurance.

(a) Each Party agrees that (i) all rights to indemnification or exculpation now existing in favor of the directors and officers of the Group Companies, as provided for under applicable Law, in the Group Companies' Governing Documents or under indemnification agreements in effect as of immediately prior to the Effective Time, in either case, solely with respect to any matters occurring on or prior to the Effective Time, shall survive the transactions contemplated by this Agreement and shall continue in full force and effect from and after the Effective Time for a period of six (6) years and (ii) SOAC will cause the applicable Group Companies to perform and discharge all obligations to provide such indemnity and exculpation during such six (6)-year period. To the maximum extent permitted by applicable Law, during such six (6)-year period, SOAC shall cause the applicable Group Companies to advance expenses in connection with such indemnification as provided in the Group Companies' Governing Documents or other applicable agreements in effect as of immediately prior to the Effective Time. The indemnification and liability limitation or exculpation provisions of the Group Companies' Governing Documents shall not, during such six (6)-year period, be amended, repealed or otherwise modified following the Effective Time in any manner that would materially and adversely affect the rights thereunder of individuals who, as of the Effective Time or at any time prior to the Effective Time, were directors or officers of the Group Companies (the "Company D&O Persons") entitled to be so indemnified, have their liability limited or be exculpated with respect to any matters occurring prior to Closing and relating to the fact that such Company D&O Person was a director or officer of any Group Company on or prior to the Effective Time, unless such amendment, repeal or other modification is required by applicable Law.

(b) None of SOAC or the Group Companies shall have any obligation under this Section 5.14 to any Company D&O Person when and if a court of competent jurisdiction shall ultimately determine (and such determination shall have become final and non-appealable) that the indemnification of such Company D&O Person in the manner contemplated hereby is prohibited by applicable Law.

(c) The Company shall purchase, at or prior to the Closing, and SOAC shall maintain, or cause to be maintained, in effect for a period of six (6) years following the Effective Time, without lapses in coverage, a "tail" policy providing directors' and officers' liability insurance coverage for the benefit of those Persons who are currently covered by any comparable insurance policies of the Group Companies in effect as of the date of this Agreement with respect to matters occurring on or prior to the Effective Time. Such "tail" policy shall provide coverage on terms (with respect to coverage and amount) that are substantially the same as (and no less favorable in the aggregate to the Persons covered thereby) the coverage provided under the Group Companies' directors' and officers' liability insurance policies as of the date of this Agreement; provided that none of the Company, SOAC or any of their respective Affiliates shall pay a premium for such "tail" policy in excess of three-hundred percent (300%) of the most recent annual premium paid by the Group Companies prior to the date of this Agreement and, in such event, the Company, SOAC or one of their respective Affiliates shall purchase the maximum coverage available for three-hundred percent (300%) of the most recent annual premium paid by the Group Companies prior to the date of this Agreement.

(d) If SOAC or any of its successors or assigns (i) shall merge or consolidate with or merge into any other corporation or entity and shall not be the surviving or continuing corporation or entity of such consolidation or merger or (ii) shall transfer all or substantially all of their respective properties and assets as an entity in one or a series of related transactions to any Person, then in each such case, proper provisions shall be made so that the successors or assigns of SOAC shall assume all of the obligations set forth in this Section 5.14.

(e) The Company D&O Persons entitled to the indemnification, liability limitation, exculpation or insurance coverage set forth in this Section 5.14 are intended to be third-party beneficiaries of this Section 5.14. This Section 5.14 shall survive the consummation of the transactions contemplated by this Agreement and shall be binding on all successors and assigns of SOAC.

Section 5.15 Post-Closing Directors and Officers.

(a) Each of SOAC and the Company shall take all such action within its power as may be necessary or appropriate such that effective immediately after the Effective Time: (i) the SOAC Board shall consist of nine (9) directors and (ii) the members of the SOAC Board are the individuals determined in accordance with Section 5.15(b), Section 5.15(c) and Section 5.15(d).

(b) Prior to the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, the Sponsor shall designate one (1) individual (the "SOAC Designee") to be a director on the SOAC Board immediately after the Effective Time by written notice to the Company and SOAC. At any time prior to the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, the Sponsor may, by giving the Company and SOAC written notice, replace the SOAC Designee with any other individual. Notwithstanding the foregoing or anything to the contrary herein, unless otherwise agreed in writing by the Company, the SOAC Designee shall qualify as an "independent director" under the listing rules of NYSE (whether as a result of the replacement of any SOAC as contemplated by this Section 5.15(b) or otherwise).

(c) Prior to the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, the Company shall designate by written notice to the Sponsor and SOAC five (5) individuals (each a "Company Designee") to be a director on the SOAC Board immediately after the Effective Time, including Mr. Gerard Barron who shall also be designated the Chairman of the SOAC Board. At any time prior to the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, the Company may, by giving SOAC and the Sponsor written notice, replace any Company Designee with any other individual. Notwithstanding the foregoing or anything to the contrary herein, unless otherwise agreed in writing by the Sponsor and SOAC, at least one (1) Company Designee shall qualify as an "independent director" under the listing rules of NYSE (whether as a result of the replacement of any Independent Designee as contemplated by this Section 5.15(c) or otherwise).

(d) Prior to the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, the Company shall designate three (3) individuals (each an "Independent Designee") to be a director on the SOAC Board immediately after the Effective Time by written notice to the Company and SOAC. At any time prior to the time at which the Registration Statement/Proxy Statement is declared effective under the Securities Act, the Company may by giving SOAC and the Sponsor written notice, replace any Independent Designee with any other individual. Notwithstanding the foregoing or anything to the contrary herein, each Independent Designee shall qualify as an "independent director" under the listing rules of NYSE (whether as a result of the replacement of any Independent Designee as contemplated by this Section 5.15(d) or otherwise).

Section 5.16 Financials.

(a) The Company shall deliver to SOAC, as promptly as reasonably practicable following the date of this Agreement, the Closing Company Financial Statements. The Closing Company Financial Statements (A) will be prepared in accordance with GAAP applied on a consistent basis throughout the periods indicated (subject to normal year-end audit adjustments (none of which is expected to be individually or in the aggregate material) and the absence of notes thereto), (B) will fairly present in all material respects the financial position, results of operations, cash flows and changes of equity of the Group Companies as at the date thereof and for the period indicated therein, (C) will be prepared in accordance with GAAP applied on a consistent basis throughout the periods indicated (subject to normal year-end audit adjustments (none of which are, individually or in the aggregate, material) and the

absence of notes thereto) and (D) will comply in all material respects with the applicable accounting requirements and with the rules and regulations of the SEC, the Exchange Act and the Securities Act in effect as of the respective dates of delivery (including Regulation S-X or Regulation S-K, as applicable).

(b) The Company shall use its reasonable best efforts (i) to assist, upon advance written notice, during normal business hours and in a manner such as to not unreasonably interfere with the normal operation of the Group Companies, SOAC in causing to be prepared in a timely manner any other financial information or statements (including customary pro forma financial statements) that are required to be included in the Registration Statement/Proxy Statement and any other filings to be made by SOAC with the SEC in connection with the transactions contemplated by this Agreement or any Ancillary Document and (ii) to obtain the consents of its auditors with respect thereto as may be required by applicable Law or requested by the SEC.

Section 5.17 SOAC Incentive Equity Plan. Prior to the effectiveness of the Registration Statement/Proxy Statement, the SOAC Board shall approve and adopt an equity incentive plan, in substantially the form attached hereto as Exhibit I and with any changes or modifications thereto as the Company and SOAC may mutually agree (such agreement not to be unreasonably withheld, conditioned or delayed by either the Company or SOAC, as applicable) (the "SOAC Incentive Equity Plan"), in the manner prescribed under applicable Laws, effective as of one day prior to the Closing Date, reserving a number of SOAC Common Shares for grant thereunder equal to (i) eleven percent (11%) of the number of shares of SOAC Common Shares outstanding following the Closing after giving effect to the Transactions (including the Share Exchange and Amalgamation). The SOAC Incentive Equity Plan will provide that the SOAC Common Shares reserved for issuance thereunder will automatically increase annually on the first day of each fiscal year beginning with the 2022 fiscal year in an amount equal to four percent (4%) of SOAC Common Shares outstanding on the last day of the immediately preceding fiscal year or such lesser amount as determined by the administrator of the SOAC Incentive Equity Plan. Nothing in this Section 5.17, express or implied, shall (i) create any rights or remedies of any nature whatsoever, including third party beneficiary rights, in any Person (other than the Parties) by reason of this Section 5.17, (ii) create any right in any Person to continued employment or service with SOAC or any of its Affiliates, or any particular term or condition of employment or service, (iii) limit the ability of SOAC or any of its Affiliates from: (y) terminating the employment or service of any Person at any time for any or no reason, (z) adopting, establishing, amending, modifying or terminating any benefit or compensation plan, policy, program, agreement or arrangement, other than the SOAC Incentive Equity Plan, or (iv) be construed to establish, amend, modify or terminate any benefit or compensation plan, policy, program, agreement or arrangement.

Section 5.18 Company Related Party Transactions. The Company shall take, or cause to be taken, all actions necessary or advisable to terminate at or prior to the Closing all Company Related Party Transactions (other than those set forth on Section 5.18 of the Company Disclosure Schedules) without any further obligations or Liabilities to the Company or any of its Affiliates (including the other Group Companies and, from and after the Effective Time, SOAC and its Affiliates).

ARTICLE 6
CONDITIONS TO CONSUMMATION OF THE TRANSACTIONS CONTEMPLATED BY THIS AGREEMENT

Section 6.1 Conditions to the Obligations of the Parties. The obligations of the Parties to consummate the transactions contemplated by this Agreement are subject to the satisfaction or, if permitted by applicable Law, waiver by the Company and SOAC of the following conditions:

(a) the Company Arrangement Resolution shall have been approved by the Company Required Approval at the Company Shareholders Meeting in accordance with the Interim Order and applicable Law and a certified copy of such Company Arrangement Resolution shall have been delivered to SOAC;

(b) subject to Article 8, the Final Order shall have been obtained on terms consistent with this Agreement and shall not have been set aside or modified in a manner unacceptable to either SOAC or the Company, each acting reasonably, on appeal or otherwise;

(c) the Investment Canada Act Approval shall have been obtained (only if either Party determines, acting reasonably, that an application for review under Part IV is required or appropriate);

(d) no Order or Law issued by any court of competent jurisdiction or other Governmental Entity or other legal restraint or prohibition preventing the consummation of the transactions contemplated by this Agreement shall be in effect;

(e) the Registration Statement/Proxy Statement shall have become effective in accordance with the provisions of the Securities Act, no stop order shall have been issued by the SEC and shall remain in effect with respect to the Registration Statement/Proxy Statement, and no proceeding seeking such a stop order shall have been threatened or initiated by the SEC and remain pending;

(f) the SOAC Shareholder Approval shall have been obtained;

(g) SOAC's initial listing application with NYSE in connection with the transactions contemplated by this Agreement shall have been approved and, immediately following the Effective Time, SOAC shall satisfy any applicable initial and continuing listing requirements of NYSE, and SOAC shall not have received any notice of non-compliance therewith that has not been cured or would not be cured at or immediately following the Effective Time, and the SOAC Common Shares (after giving effect, for the avoidance of doubt, to the SOAC Continuance and, including, for the avoidance of doubt, the SOAC Common Shares to be issued pursuant to the Transactions) shall have been approved for listing on NYSE; and

(h) after giving effect to the transactions contemplated hereby (including the PIPE Financing), SOAC shall have at least $5,000,001 of net tangible assets (as determined in accordance with Rule 3a51-1(g)(1) of the Exchange Act) immediately after the Effective Time.

Section 6.2 Other Conditions to the Obligations of the SOAC Parties. The obligations of the SOAC Parties to consummate the transactions contemplated by this Agreement are subject to the satisfaction or, if permitted by applicable Law, waiver by SOAC (on behalf of itself and the other SOAC Parties) of the following further conditions:

(a) (i) the Company Fundamental Representations (other than the representations and warranties set forth in Section 3.2(a) and Section 3.8(a)) and the representations and warranties of the Company set forth in Section 3.16(g) shall be true and correct (without giving effect to any limitation as to "materiality" or "Company Material Adverse Effect" or any similar limitation set forth herein) in all material respects as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct in all material respects as of such earlier date), (ii) the representations and warranties set forth in Section 3.2(a) shall be true and correct in all respects (except for *de minimis* inaccuracies) as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct in all respects (except for *de minimis* inaccuracies) as of such earlier date), (iii) the representations and warranties set forth in Section 3.8(a) shall be true and correct in all respects as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct in all respects as of such earlier date), provided, however, that this clause (iii) shall be deemed to be satisfied if no Company Material Adverse Effect is continuing, and (iv) the representations and warranties of the of the Company set forth in Article 3 (other than the Company Fundamental Representations and the representations and warranties of the Company set forth in Section 3.16(g)) shall be true and correct (without giving effect to any limitation as to "materiality" or "Company Material Adverse Effect" or any similar limitation set forth herein) in all respects as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct in all respects as of such earlier date), except where the failure of such representations and warranties to be true and correct, taken as a whole, does not cause a Company Material Adverse Effect;

(b) the Company shall have performed and complied in all material respects with the covenants and agreements required to be performed or complied with by the Company under this Agreement at or prior to the Closing;

(c) since the date of this Agreement, no Company Material Adverse Effect has occurred that is continuing;

(d) the Company shall have consummated the Preferred Share Conversion and the Convertible Debenture Conversion; and

(e) at or prior to the Closing, the Company shall have delivered, or caused to be delivered, to SOAC a certificate duly executed by an authorized officer of the Company, dated as of the Closing Date, to the effect that the conditions specified in Section 6.2(a), Section 6.2(b) and Section 6.2(c) are satisfied, in a form and substance reasonably satisfactory to SOAC.

Section 6.3 Other Conditions to the Obligations of the Company. The obligations of the Company to consummate the transactions contemplated by this Agreement are subject to the satisfaction or, if permitted by applicable Law, waiver by the Company of the following further conditions:

(a) (i) the SOAC Fundamental Representations (other than the representations and warranties set forth in Section 4.6(a)) and the representations and warranties of the SOAC Parties set forth in Section 4.15(i) shall be true and correct in all material respects as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct in all material respects as of such earlier date), (ii) the representations and warranties set forth in Section 4.6(a) shall be true and correct in all respects (except for *de minimis* inaccuracies) as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct in all respects (except for *de minimis* inaccuracies) as of such earlier date), (iii) the representations and warranties of the SOAC Parties (other than the SOAC Fundamental Representations and the representations and warranties of the SOAC Parties set forth in Section 4.15(i)) contained in Article 4 of this Agreement shall be true and correct (without giving effect to any limitation as to "materiality" or "SOAC Material Adverse Effect" or any similar limitation set forth herein) in all respects as of the Closing Date, as though made on and as of the Closing Date (except to the extent that any such representation and warranty is made as of an earlier date, in which case such representation and warranty shall be true and correct as of such earlier date), except where the failure of such representations and warranties to be true and correct, taken as a whole, does not cause a SOAC Material Adverse Effect;

(b) the SOAC Parties shall have performed and complied in all material respects with the covenants and agreements required to be performed or complied with by them under this Agreement at or prior to the Closing;

(c) the Aggregate Transaction Proceeds shall be equal to or greater than $250,000,000;

(d) since the date of this Agreement, no SOAC Material Adverse Effect has occurred that is continuing;

(e) at or prior to the Closing, SOAC shall have delivered, or caused to be delivered, to the Company a certificate duly executed by an authorized officer of SOAC, dated as of the Closing Date, to the effect that the conditions specified in Section 6.3(a) and Section 6.3(b) are satisfied, in a form and substance reasonably satisfactory to the Company;

(f) at or prior to the Closing, SOAC shall have delivered, or caused to be delivered, to the Company the Registration Rights Agreement duly executed by an authorized officer of SOAC, dated as of the Closing Date; and

(g) SOAC shall have taken all actions necessary or appropriate such that effective immediately after the Effective Time, the SOAC Board shall consist of the number of directors, and be comprised of the individuals, determined pursuant to Section 5.15.

Section 6.4 Frustration of Closing Conditions. The Company may not rely on the failure of any condition set forth in this Article 6 to be satisfied if such failure was proximately caused by the Company's failure to use reasonable best efforts to cause the Closing to occur, as required by Section 5.2, or a breach of this Agreement. None of the SOAC Parties may rely on the failure of any condition set forth in this Article 6 to be satisfied if such failure was proximately caused by a SOAC Party's failure to use reasonable best efforts to cause the Closing to occur, as required by Section 5.2, or a breach of this Agreement.

ARTICLE 7
TERMINATION

Section 7.1 Termination. This Agreement may be terminated and the transactions contemplated by this Agreement may be abandoned at any time prior to the Closing:

(a) by mutual written consent of SOAC and the Company;

(b) by SOAC, if any of the representations or warranties set forth in Article 3 shall not be true and correct or if the Company has failed to perform any covenant or agreement on the part of the Company set forth in this Agreement (including an obligation to consummate the Closing) such that the condition to Closing set forth in either Section 6.2(a) or Section 6.2(b) could not be satisfied and the breach or breaches causing such representations or warranties not to be true and correct, or the failures to perform any covenant or agreement, as applicable, is (or are) not cured or cannot be cured within the earlier of (i) thirty (30) days after written notice thereof is delivered to the Company by SOAC, and (ii) the Termination Date; provided, however, that none of the SOAC Parties is then in breach of this Agreement so as to prevent the condition to Closing set forth in either Section 6.3(a) or Section 6.3(b) from being satisfied;

(c) by the Company, if any of the representations or warranties set forth in Article 4 shall not be true and correct or if any SOAC Party has failed to perform any covenant or agreement on the part of such applicable SOAC Party set forth in this Agreement (including an obligation to consummate the Closing) such that the condition to Closing set forth in either Section 6.3(a) or Section 6.3(b) could not be satisfied and the breach or breaches causing such representations or warranties not to be true and correct, or the failures to perform any covenant or agreement, as applicable, is (or are) not cured or cannot be cured within the earlier of (i) thirty (30) days after written notice thereof is delivered to SOAC by the Company and (ii) the Termination Date; provided, however, the Company is not then in breach of this Agreement so as to prevent the condition to Closing set forth in Section 6.2(a) or Section 6.2(b) from being satisfied;

(d) by either SOAC or the Company, if the transactions contemplated by this Agreement shall not have been consummated on or prior to October 4, 2021 (the "Termination Date"); provided, that (i) the right to terminate this Agreement pursuant to this Section 7.1(d) shall not be available to SOAC if any SOAC Party's breach of any of its covenants or obligations under this Agreement shall have proximately caused the failure to consummate the transactions contemplated by this Agreement on or before the Termination Date, and (ii) the right to terminate this Agreement pursuant to this Section 7.1(d) shall not be available to the Company if the Company's breach of its covenants or obligations under this Agreement shall have proximately caused the failure to consummate the transactions contemplated by this Agreement on or before the Termination Date;

(e) by either SOAC or the Company, if any Governmental Entity shall have issued an Order or taken any other action permanently enjoining, restraining or otherwise prohibiting the transactions contemplated by this Agreement and such Order or other action shall have become final and nonappealable;

(f) by either SOAC or the Company if the SOAC Shareholders Meeting has been held (including any adjournment thereof), has concluded, SOAC's shareholders have duly voted and the Required SOAC Shareholder Approval was not obtained; or

(g) by SOAC, if the Company Required Approval shall not have been obtained at the Company Shareholders Meeting in accordance with the Interim Order and applicable Law.

Section 7.2 Effect of Termination. In the event of the termination of this Agreement pursuant to Section 7.1, this entire Agreement shall forthwith become void (and there shall be no Liability or obligation on the part of the Parties and their respective Non-Party Affiliates) with the exception of Section 5.3(a), this Section 7.2, Section 9.2 through Section 9.18 and Article 1 (to the extent related to the foregoing), each of which shall survive such termination and remain valid and binding obligations of the Parties and (b) the Confidentiality Agreements, which shall survive such termination and remain valid and binding obligations of the parties thereto in accordance with their respective terms. Notwithstanding the foregoing or anything to the contrary herein, the termination of this Agreement pursuant to Section 7.1 shall not affect any Liability on the part of any Party for any Willful Breach

of any covenant or agreement set forth in this Agreement prior to such termination or Fraud or (ii) any Person's Liability under any Ancillary Document to which he, she or it is a party to the extent arising from a claim against such Person by another Person party to such agreement on the terms and subject to the conditions thereunder.

ARTICLE 8
ALTERNATIVE TRANSACTION

Section 8.1 **Alternative Transaction**. In the event that the Final Order is not obtained (for any reason other than as a result of a material breach of SOAC's covenants or obligations under this Agreement), the Parties agree to take all actions reasonably required to execute and deliver all related documentation in order to complete the Share Exchange by way of an amalgamation under Part 9, Division 3 of the BCBCA (an "Alternative Transaction"), including, as soon as reasonably practicable following the Court hearing relating the Final Order in accordance with Section 2.1(d), (i) the entering into of an amalgamation agreement with SOAC on substantially the same terms and conditions as this Agreement, and (ii) the preparation of a management information circular and holding of a meeting of the Company Shareholders for the approval of the Alternative Transaction; provided, however, if reasonably practicable, and subject to the consent of each of the Company and SOAC, in each case not to be unreasonably withheld, conditioned or delayed, Company Shareholders shall be given the opportunity to effect the Share Exchange by way of share exchange immediately prior to the amalgamation contemplated by this Section 8.1.

ARTICLE 9
MISCELLANEOUS

Section 9.1 **Non-Survival**. Other than those representations, warranties and covenants set forth in Section 2.5, Section 2.6, Section 2.8, Section 3.24, Section 3.25, Section 4.17 and Section 4.18, each of which shall survive following the Effective Time, or as otherwise provided in the last sentence of this Section 9.1, each of the representations and warranties, and each of the agreements and covenants (to the extent such agreement or covenant contemplates or requires performance at or prior to the Effective Time), of the Parties set forth in this Agreement, shall terminate at the Effective Time, such that no claim for breach of any such representation, warranty, agreement or covenant, detrimental reliance or other right or remedy (whether in contract, in tort, at law, in equity or otherwise) may be brought with respect thereto after the Effective Time against any Party, any Company Non-Party Affiliate or any SOAC Non-Party Affiliate. Each covenant and agreement contained herein that, by its terms, expressly contemplates performance after the Effective Time shall so survive the Effective Time in accordance with its terms, and each covenant and agreement contained in any Ancillary Document that, by its terms, expressly contemplates performance after the Effective Time shall so survive the Effective Time in accordance with its terms and any other provision in any Ancillary Document that expressly survives the Effective Time shall so survive the Effective Time in accordance with the terms of such Ancillary Document.

Section 9.2 **Entire Agreement; Assignment**. This Agreement (together with the Ancillary Documents) constitutes the entire agreement among the Parties with respect to the subject matter hereof and supersedes all other prior agreements and understandings, both written and oral, among the Parties with respect to the subject matter hereof. This Agreement may not be assigned by any Party (whether by operation of law or otherwise) without the prior written consent of (a) SOAC and the Company prior to Closing and (b) SOAC and the Sponsor after the Closing. Any attempted assignment of this Agreement not in accordance with the terms of this Section 9.2 shall be void.

Section 9.3 **Amendment**. This Agreement may be amended or modified only by a written agreement executed and delivered by (a) SOAC and the Company prior to the Closing and (b) SOAC and the Sponsor after the Closing. This Agreement may not be modified or amended except as provided in the immediately preceding sentence and any purported amendment by any Party or Parties effected in a manner which does not comply with this Section 9.3 shall be void, *ab initio*.

Section 9.4 **Notices**. All notices, requests, claims, demands and other communications hereunder shall be in writing and shall be given (and shall be deemed to have been duly given) by delivery in person, by e-mail (having obtained electronic delivery confirmation thereof (*i.e.*, an electronic record of the sender that the e-mail was sent

to the intended recipient thereof without an "error" or similar message that such e-mail was not received by such intended recipient)), or by registered or certified mail (postage prepaid, return receipt requested) (upon receipt thereof) to the other Parties as follows:

(a) If to any SOAC Party, to:

c/o Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Attention: Scott Leonard
Gina Stryker
E-mail: scott.leonard@soa-corp.com
gina.stryker@soa-corp.com

with a copy (which shall not constitute notice) to:

Kirkland & Ellis LLP
609 Main Street
Houston, Texas 77002
Attention: Douglas E. Bacon, P.C.
Ryan Brissette
E-mail: doug.bacon@kirkland.com
ryan.brissette@kirkland.com

with a copy (which shall not constitute notice) to:

Stikeman Elliot LLP
1155 René-Lévesque Blvd.
West, 41st Floor,
Montréal, QC H3B 3V2
Attention: Warren Katz
Email: wkatz@stikeman.com

(b) If to the Company, to:

DeepGreen Metals Inc.
595 Howe Street,
10th Floor
Vancouver, BC, V6C T25
Attention: Gerard Barron
E-mail: gerard@deep.green

with a copy (which shall not constitute notice) to:

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
One Financial Center
Boston, MA 02111
Attention: Michael L. Fantozzi
E-mail: MLFantozzi@mintz.com

with a copy (which shall not constitute notice) to:

Fasken Martineau DuMoulin LLP
333 Bay Street
Suite 2400
Toronto, Ontario M5H 2T6
Attention: Jay A. Lefton
E-mail: JLefton@fasken.com

or to such other address as the Party to whom notice is given may have previously furnished to the others in writing in the manner set forth above.

Section 9.5 **Governing Law**. This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Delaware or any other jurisdiction) that would cause the application of the law of any jurisdiction other than the State of Delaware; provided, however, that (i) the Cayman Islands Act shall also apply to the SOAC Continuance, and (ii) the laws of the Province of British Columbia, Canada and the federal laws of Canada applicable therein shall also apply to the SOAC Continuance, the Preferred Share Conversion, the Convertible Debenture Conversion and corporate matters related to the Company Information Circular, the Company Shareholders Meeting and the Plan of Arrangement.

Section 9.6 **Fees and Expenses**. Except as otherwise set forth in this Agreement or in the Sponsor Letter Agreement, all fees and expenses incurred in connection with this Agreement, the Ancillary Documents and the transactions contemplated hereby and thereby, including the fees and disbursements of counsel, financial advisors and accountants, shall be paid by the Party incurring such fees or expenses; provided that, for the avoidance of doubt, (a) if this Agreement is terminated in accordance with its terms, the Company shall pay, or cause to be paid, all Unpaid Company Expenses and SOAC shall pay, or cause to be paid, all Unpaid SOAC Expenses and (b) if the Closing occurs, then SOAC shall pay, or cause to be paid, all Unpaid Company Expenses and all Unpaid SOAC Expenses.

Section 9.7 **Construction; Interpretation**. The term "this Agreement" means this Business Combination Agreement together with the Schedules and Exhibits hereto, as the same may from time to time be amended, modified, supplemented or restated in accordance with the terms hereof. The headings set forth in this Agreement are inserted for convenience only and shall not affect in any way the meaning or interpretation of this Agreement. No Party, nor its respective counsel, shall be deemed the drafter of this Agreement for purposes of construing the provisions hereof, and all provisions of this Agreement shall be construed according to their fair meaning and not strictly for or against any Party. Unless otherwise indicated to the contrary herein by the context or use thereof: (a) the words, "herein," "hereto," "hereof" and words of similar import refer to this Agreement as a whole, including the Schedules and Exhibits, and not to any particular section, subsection, paragraph, subparagraph or clause set forth in this Agreement; (b) masculine gender shall also include the feminine and neutral genders, and vice versa; (c) words importing the singular shall also include the plural, and vice versa; (d) the words "include," "includes" or "including" shall be deemed to be followed by the words "without limitation"; (e) references to "$" or "dollar" or "US$" shall be references to United States dollars; (f) the word "or" is disjunctive but not necessarily exclusive; (g) the words "writing", "written" and comparable terms refer to printing, typing and other means of reproducing words (including electronic media) in a visible form; (h) the word "day" means calendar day unless Business Day is expressly specified; (i) the word "extent" in the phrase "to the extent" means the degree to which a subject or other thing extends, and such phrase shall not mean simply "if"; (j) all references to Articles, Sections, Exhibits or Schedules are to Articles, Sections, Exhibits and Schedules of this Agreement; (k) the words "provided" or "made available" or words of similar import (regardless of whether capitalized or not) shall mean, when used with reference to documents or other materials required to be provided or made available to SOAC, any documents or other materials posted to the electronic data room located at ansarada.com under the project name "DeepGreen Metals" as of 5:00 p.m., Eastern Time, at least one (1) Business Day prior to the date of this Agreement and any other document or materials posted prior to the date hereof or delivered to SOAC or its Representatives which posting or delivery was acknowledged by email by SOAC or its Representatives; (l) all references to any Law will be to such Law as amended, supplemented or otherwise modified or re-enacted from time to time; and (m) all references to any Contract are to that Contract as amended or modified from time to time in accordance with the terms thereof (subject to any restrictions on amendments or modifications set forth in this Agreement). If any action under this Agreement is required to be done or taken on a day that is not a Business Day, then such action shall be required to be done or taken not on such day but on the first succeeding Business Day thereafter.

Section 9.8 **Exhibits and Schedules**. All Exhibits and Schedules, or documents expressly incorporated into this Agreement, are hereby incorporated into this Agreement and are hereby made a part hereof as if set out in full in this Agreement. The Schedules shall be arranged in sections and subsections corresponding to the numbered and lettered Sections and subsections set forth in this Agreement. Any item disclosed in the Company Disclosure Schedules or in the SOAC Disclosure Schedules corresponding to any Section or subsection of Article 3 (in the case of the Company Disclosure Schedules) or Article 4 (in the case of the SOAC Disclosure Schedules) shall be deemed to have been disclosed with respect to every other section and subsection of Article 3 (in the case of the Company Disclosure Schedules) or Article 4 (in the case of the SOAC Disclosure Schedules), as applicable, where the relevance of such disclosure to such other Section or subsection is reasonably apparent on the face of the disclosure.

The information and disclosures set forth in the Schedules that correspond to the section or subsections of Article 3 or Article 4 may not be limited to matters required to be disclosed in the Schedules, and any such additional information or disclosure is for informational purposes only and does not necessarily include other matters of a similar nature.

Section 9.9 Parties in Interest. This Agreement shall be binding upon and inure solely to the benefit of each Party and its successors and permitted assigns and, except as provided in Section 5.13, Section 5.14, the two subsequent sentences of this Section 9.9 and Section 9.13, nothing in this Agreement, express or implied, is intended to or shall confer upon any other Person any rights, benefits or remedies of any nature whatsoever under or by reason of this Agreement. The Sponsor shall be an express third-party beneficiary of Section 5.4, Section 5.16, Section 9.2, Section 9.3, Section 9.14 and this Section 9.9 (to the extent related to the foregoing). Each of the Non-Party Affiliates shall be an express third-party beneficiary of Section 9.13 and this Section 9.9 (to the extent related to the foregoing).

Section 9.10 Severability. Whenever possible, each provision of this Agreement will be interpreted in such a manner as to be effective and valid under applicable Law, but if any term or other provision of this Agreement is held to be invalid, illegal or unenforceable under applicable Law, all other provisions of this Agreement shall remain in full force and effect so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner materially adverse to any Party. Upon such determination that any term or other provision of this Agreement is invalid, illegal or unenforceable under applicable Law, the Parties shall negotiate in good faith to modify this Agreement so as to effect the original intent of the Parties as closely as possible in an acceptable manner in order that the transactions contemplated hereby are consummated as originally contemplated to the greatest extent possible.

Section 9.11 Counterparts; Electronic Signatures. This Agreement and each Ancillary Document (including any of the closing deliverables contemplated hereby) may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which shall constitute one and the same agreement. Delivery of an executed counterpart of a signature page to this Agreement or any Ancillary Document (including any of the closing deliverables contemplated hereby) by e-mail, or scanned pages shall be effective as delivery of a manually executed counterpart to this Agreement or any such Ancillary Document.

Section 9.12 Knowledge of Company; Knowledge of SOAC. For all purposes of this Agreement, the phrase "to the Company's knowledge" and "known by the Company" and any derivations thereof shall mean as of the applicable date, the actual knowledge of the individuals set forth on Section 9.12(a) of the Company Disclosure Schedules, assuming reasonable due inquiry and investigation of his or her direct reports. For all purposes of this Agreement, the phrase "to SOAC's knowledge" and "to the knowledge of SOAC" and any derivations thereof shall mean as of the applicable date, the actual knowledge of the individuals set forth on Section 9.12(b) of the SOAC Disclosure Schedules, assuming reasonable due inquiry and investigation of his or her direct reports. For the avoidance of doubt, none of the individuals set forth on Section 9.12(a) of the Company Disclosure Schedules or Section 9.12(b) of the SOAC Disclosure Schedules shall have any personal Liability or obligations regarding such knowledge.

Section 9.13 No Recourse. Except for claims pursuant to any Ancillary Document by any party(ies) thereto against any Non-Party Affiliate, and then solely with respect to claims against the Non-Party Affiliates that are party to the applicable Ancillary Document, each Party agrees on behalf of itself and on behalf of the Company Non-Party Affiliates, in the case of the Company, and the SOAC Non-Party Affiliates, in the case of SOAC, that (a) this Agreement may only be enforced against, and any action for breach of this Agreement may only be made against, the Parties, and no claims of any nature whatsoever arising under or relating to this Agreement, the negotiation hereof or its subject matter, or the transactions contemplated hereby shall be asserted against any Non-Party Affiliate, and (b) none of the Non-Party Affiliates shall have any Liability arising out of or relating to this Agreement, the negotiation hereof or its subject matter, or the transactions contemplated hereby, including with respect to any claim (whether in tort, contract or otherwise) for breach of this Agreement or in respect of any written or oral representations made or alleged to be made in connection herewith, as expressly provided herein, or for any actual or alleged inaccuracies, misstatements or omissions with respect to any information or materials of any kind furnished by the Company, SOAC or any Non-Party Affiliate concerning any Group Company, any SOAC Party, this Agreement or the transactions contemplated hereby.

Section 9.14 **Extension; Waiver**. The Company prior to the Closing and the Company and the Sponsor after the Closing may (a) extend the time for the performance of any of the obligations or other acts of the SOAC Parties set forth herein, (b) waive any inaccuracies in the representations and warranties of the SOAC Parties set forth herein or (c) waive compliance by the SOAC Parties with any of the agreements or conditions set forth herein. SOAC, may (i) extend the time for the performance of any of the obligations or other acts of the Company set forth herein, (ii) waive any inaccuracies in the representations and warranties of the Company set forth herein or (iii) waive compliance by the Company with any of the agreements or conditions set forth herein. Any agreement on the part of any such Party to any such extension or waiver shall be valid only if set forth in a written instrument signed on behalf of such Party. Any waiver of any term or condition shall not be construed as a waiver of any subsequent breach or a subsequent waiver of the same term or condition, or a waiver of any other term or condition of this Agreement. The failure of any Party to assert any of its rights hereunder shall not constitute a waiver of such rights.

Section 9.15 **Waiver of Jury Trial**. THE PARTIES EACH HEREBY WAIVES, TO THE FULLEST EXTENT PERMITTED BY LAW, ANY RIGHT TO TRIAL BY JURY OF ANY PROCEEDING, CLAIM, DEMAND, ACTION, OR CAUSE OF ACTION (I) ARISING UNDER THIS AGREEMENT OR UNDER ANY ANCILLARY DOCUMENT OR (II) IN ANY WAY CONNECTED WITH OR RELATED OR INCIDENTAL TO THE DEALINGS OF THE PARTIES IN RESPECT OF THIS AGREEMENT OR ANY ANCILLARY DOCUMENT OR ANY OF THE TRANSACTIONS RELATED HERETO OR THERETO OR ANY FINANCING IN CONNECTION WITH THE TRANSACTIONS CONTEMPLATED HEREBY OR ANY OF THE TRANSACTIONS CONTEMPLATED THEREBY, IN EACH CASE, WHETHER NOW EXISTING OR HEREAFTER ARISING, AND WHETHER IN CONTRACT, TORT, EQUITY, OR OTHERWISE. THE PARTIES EACH HEREBY AGREES AND CONSENTS THAT ANY SUCH PROCEEDING, CLAIM, DEMAND, ACTION OR CAUSE OF ACTION SHALL BE DECIDED BY COURT TRIAL WITHOUT A JURY AND THAT THE PARTIES MAY FILE AN ORIGINAL COUNTERPART OF A COPY OF THIS AGREEMENT WITH ANY COURT AS WRITTEN EVIDENCE OF THE CONSENT OF THE PARTIES HERETO TO THE WAIVER OF THEIR RIGHT TO TRIAL BY JURY. EACH PARTY CERTIFIES AND ACKNOWLEDGES THAT (A) NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) EACH SUCH PARTY UNDERSTANDS AND HAS CONSIDERED THE IMPLICATIONS OF THIS WAIVER, (C) EACH SUCH PARTY MAKES THIS WAIVER VOLUNTARILY AND (D) EACH SUCH PARTY HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION 9.15.

Section 9.16 **Submission to Jurisdiction**. Each of the Parties irrevocably and unconditionally submits to the exclusive jurisdiction of the Chancery Court of the State of Delaware (or, if the Chancery Court of the State of Delaware declines to accept jurisdiction, any state or federal court within State of New York, New York County), for the purposes of any Proceeding, claim, demand, action or cause of action (a) arising under this Agreement or under any Ancillary Document or (b) in any way connected with or related or incidental to the dealings of the Parties in respect of this Agreement or any Ancillary Document or any of the transactions contemplated hereby or any of the transactions contemplated thereby, and irrevocably and unconditionally waives any objection to the laying of venue of any such Proceeding in any such court, and further irrevocably and unconditionally waives and agrees not to plead or claim in any such court that any such Proceeding has been brought in an inconvenient forum. Each Party hereby irrevocably and unconditionally waives, and agrees not to assert, by way of motion or as a defense, counterclaim or otherwise, in any Proceeding claim, demand, action or cause of action against such Party (i) arising under this Agreement or under any Ancillary Document or (ii) in any way connected with or related or incidental to the dealings of the Parties in respect of this Agreement or any Ancillary Document or any of the transactions contemplated hereby or any of the transactions contemplated thereby, (A) any claim that such Party is not personally subject to the jurisdiction of the courts as described in this Section 9.16 for any reason, (B) that such Party or such Party's property is exempt or immune from the jurisdiction of any such court or from any legal process commenced in such courts (whether through service of notice, attachment prior to judgment, attachment in aid of execution of judgment, execution of judgment or otherwise) and (C) that (x) the Proceeding, claim, demand, action or cause of action in any such court is brought against such Party in an inconvenient forum, (y) the venue of such Proceeding, claim, demand, action or cause of action against such Party is improper or (z) this Agreement, or the subject matter hereof, may not be enforced against such Party in or by such courts. Each Party agrees that service of any process, summons, notice or document by registered mail to such party's respective address set forth in Section 9.4 shall be effective service of process for any such Proceeding, claim, demand, action or cause of action.

Section 9.17 **Remedies**. Except as otherwise expressly provided herein, any and all remedies provided herein will be deemed cumulative with and not exclusive of any other remedy conferred hereby, or by Law or equity upon such Party, and the exercise by a Party of any one remedy will not preclude the exercise of any other remedy. The Parties agree that irreparable damage for which monetary damages, even if available, would not be an adequate remedy, would occur in the event that the Parties do not perform their respective obligations under the provisions of this Agreement (including failing to take such actions as are required of them hereunder to consummate the transactions contemplated by this Agreement) in accordance with their specific terms or otherwise breach such provisions. It is accordingly agreed that the Parties shall be entitled to seek an injunction or injunctions, specific performance and other equitable relief to prevent breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement, in each case, without posting a bond or undertaking and without proof of damages and this being in addition to any other remedy to which they are entitled at law or in equity. Each of the Parties agrees that it will not oppose the granting of an injunction, specific performance and other equitable relief when expressly available pursuant to the terms of this Agreement on the basis that the other parties have an adequate remedy at law or an award of specific performance is not an appropriate remedy for any reason at law or equity.

Section 9.18 **Trust Account Waiver**. Reference is made to the final prospectus of SOAC, filed with the SEC (File No. 333-237245) on May 6, 2020 (the "Prospectus"). The Company acknowledges and agrees and understands that SOAC has established a trust account (the "Trust Account") containing the proceeds of its initial public offering (the "IPO") and from certain private placements occurring simultaneously with the IPO (including interest accrued from time to time thereon) for the benefit of SOAC's public shareholders (including overallotment shares acquired by SOAC's underwriters, the "Public Shareholders"), and SOAC may disburse monies from the Trust Account only in the express circumstances described in the Prospectus. For and in consideration of SOAC entering into this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Company hereby agrees on behalf of itself and its Representatives that, notwithstanding the foregoing or anything to the contrary in this Agreement, none of the Company or any of its Representatives does now or shall at any time hereafter have any right, title, interest or claim of any kind in or to any monies in the Trust Account or distributions therefrom, or make any claim against the Trust Account (including any distributions therefrom), regardless of whether such claim arises as a result of, in connection with or relating in any way to, this Agreement or any proposed or actual business relationship between SOAC or any of its Representatives, on the one hand, and, the Company or any of its Representatives, on the other hand, or any other matter, and regardless of whether such claim arises based on contract, tort, equity or any other theory of legal liability (any and all such claims are collectively referred to hereafter as the "Trust Account Released Claims"). The Company, on its own behalf and on behalf of its Representatives, hereby irrevocably waives any Trust Account Released Claims that it or any of its Representatives may have against the Trust Account (including any distributions therefrom) now or in the future as a result of, or arising out of, any negotiations, or Contracts with SOAC or its Representatives and will not seek recourse against the Trust Account (including any distributions therefrom) for any reason whatsoever (including for an alleged breach of any agreement with SOAC or its Affiliates).

* * * * *

IN WITNESS WHEREOF, each of the Parties has caused this Business Combination Agreement to be duly executed on its behalf as of the day and year first above written.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

By: /s/ Scott Leonard
Name: Scott Leonard
Title: Chief Executive Officer

1291924 B.C. UNLIMITED LIABILITY COMPANY

By: /s/ Scott Leonard
Name: Scott Leonard
Title: Chief Executive Officer

DEEPGREEN METALS INC.

By: /s/ Gerard Barron
Name: Gerard Barron
Title: Chief Executive Officer

[Signature Page to Business Combination Agreement]

ANNEX B

BRITISH COLUMBIA | BC Registry Services

Foreign Corporation

CONTINUATION APPLICATION

BUSINESS CORPORATIONS ACT, section 302

Telephone: 1 877 526-1526
Email: bcregistries@gov.bc.ca

Mailing Address: PO Box 9431 Stn Prov Govt Victoria BC V8W 9V3

Courier Address: 200 – 940 Blanshard Street Victoria BC V8W 3E6

DO NOT MAIL THIS FORM to BC Registry Services unless you are instructed to do so by registry staff. The Regulation under the *Business Corporations Act* requires the electronic version of this form to be filed on the Internet at www.corporateonline.gov.bc.ca

Freedom of Information and Protection of Privacy Act (FOIPPA): Personal information provided on this form is collected, used and disclosed under the authority of the *FOIPPA* and the *Business Corporations Act* for the purposes of assessment. Questions regarding the collection, use and disclosure of personal information can be directed to the Executive Coordinator of the BC Registry Services at 1 877 526-1526, PO Box 9431 Stn Prov Govt, Victoria BC V8W 9V3.

If you are continuing a company into BC and want the BC incorporation number as its name, you will need to file this form on paper. Complete this form and mail to the Corporate Registry, along with a letter from the corporation's home jurisdiction authorizing the continuation in. For information on the content of the authorization letter, see the Corporate Online Help Centre at www.corporateonline.gov.bc.ca for "Continuation Application" and "Authorization for Continuation In."

A NAME OF COMPANY – *Choose **one** of the following:*

☑ The name TMC the metals company Inc. is the name reserved for the foreign corporation to be continued in. The name reservation number is: 0577829, *OR*

☐ The foreign corporation is to be continued in with a name created by adding "B.C. Ltd." after the incorporation number of the company.

B FOREIGN CORPORATION'S CURRENT JURISDICTION

1. Corporate number assigned by the foreign corporation's jurisdiction 358424
2. Corporation's name in the foreign corporation's jurisdiction Sustainable Opportunities Acquisition Corp.
3. Foreign corporation's date of incorporation or the most recent date of amalgamation or continuation 2019/12/18
4. Foreign corporation's jurisdiction of incorporation, amalgamation or continuation

C CONTINUATION EFFECTIVE DATE – *Choose **one** of the following:*

☐ The continuation is to take effect at the time that this notice is filed with the registrar.

☑ The continuation is to take effect at 12:01a.m. Pacific Time on [Closing Date] being a date that is not more than ten days after the date of the filing of this notice. [TBC]

☐ The continuation is to take effect at _____ ☐ a.m. or ☐ p.m. Pacific Time on being a date and time that is not more than ten days after the date of the filing of this notice.

D AUTHORIZATION FOR CONTINUATION

Authorization for the continuation from the foreign corporation's jurisdiction is:

☐ ATTACHED ☑ ALREADY FILED

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BC Registry Services

Foreign Corporation
CONTINUATION APPLICATION
BUSINESS CORPORATIONS ACT, section 302

Telephone: 1 877 526-1526
Email: bcregistries@gov.bc.ca
Mailing Address: PO Box 9431 Stn Prov Govt Victoria BC V8W 9V3
Courier Address: 200 – 940 Blanshard Street Victoria BC V8W 3E6

E **REGISTRATION AS AN EXTRAPROVINCIAL COMPANY**

Is the foreign corporation currently registered in BC as an extraprovincial company?

☐ YES ☑ NO

If YES, enter the BC registration number and name of the extraprovincial company below:

Extraprovincial Registration Number in BC _____

Extraprovincial Company Name in BC _____

(Including assumed name, if any, approved for use in BC) _____

F **CERTIFIED CORRECT** – I have read this form and found it to be correct.

NAME OF AUTHORIZED SIGNING AUTHORITY FOR THE FOREIGN CORPORATION	SIGNATURE OF AUTHORIZED SIGNING AUTHORITY FOR THE FOREIGN CORPORATION	DATE SIGNED YYYY / MM / DD
Scott Leonard	X	

NOTICE OF ARTICLES

A NAME OF COMPANY

Set out the name of the company as set out in Item A of the Continuation Application.

TMC the metals company Inc.

B TRANSLATION OF COMPANY NAME

Set out every translation of the company name that the company intends to use outside of Canada.

C DIRECTOR NAME(S) AND ADDRESS(ES)

Set out the full name, delivery address and mailing address (if different) of every director of the company. The director may select to provide either (a) the delivery address and, if different, the mailing address for the office at which the individual can usually be served with records between 9 a.m. and 4 p.m. on business days or (b) the delivery address and, if different, the mailing address of the individual's residence. The delivery address must not be a post office box. Attach an additional sheet if more space is required.

LAST NAME	FIRST NAME	MIDDLE NAME
See Schedule "A"		

	PROVINCE/STATE	COUNTRY	POSTAL CODE/ZIP CODE
DELIVERY ADDRESS			
MAILING ADDRESS			

LAST NAME	FIRST NAME	MIDDLE NAME

	PROVINCE/STATE	COUNTRY	POSTAL CODE/ZIP CODE
DELIVERY ADDRESS			
MAILING ADDRESS			

LAST NAME	FIRST NAME	MIDDLE NAME

	PROVINCE/STATE	COUNTRY	POSTAL CODE/ZIP CODE
DELIVERY ADDRESS			
MAILING ADDRESS			

LAST NAME	FIRST NAME	MIDDLE NAME

	PROVINCE/STATE	COUNTRY	POSTAL CODE/ZIP CODE
DELIVERY ADDRESS			
MAILING ADDRESS			

D REGISTERED OFFICE ADDRESSES

DELIVERY ADDRESS OF THE COMPANY'S REGISTERED OFFICE	PROVINCE	POSTAL CODE
666 Burrard St., Suite 1700, Vancouver	BC	V6C 2X8

MAILING ADDRESS OF THE COMPANY'S REGISTERED OFFICE	PROVINCE	POSTAL CODE
666 Burrard St., Suite 1700, Vancouver	BC	V6C 2X8

E RECORDS OFFICE ADDRESSES

DELIVERY ADDRESS OF THE COMPANY'S RECORDS OFFICE	PROVINCE	POSTAL CODE
666 Burrard St., Suite 1700, Vancouver	BC	V6C 2X8

MAILING ADDRESS OF THE COMPANY'S RECORDS OFFICE	PROVINCE	POSTAL CODE
666 Burrard St., Suite 1700, Vancouver	BC	V6C 2X8

F AUTHORIZED SHARE STRUCTURE

Identifying name of class or series of shares	Maximum number of shares of this class or series of shares that the company is authorized to issue, or indicate there is		Kind of shares of this class or series of shares.			Are there special rights or restrictions attached to the shares of this class or series of shares?	
	THERE IS NO MAXIMUM (☒)	MAXIMUM NUMBER OF SHARES AUTHORIZED	WITHOUT PAR VALUE (☒)	WITH A PAR VALUE OF ($)	Type of currency	YES	NO
See Schedule "B"						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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BRITISH COLUMBIA | BC Registry Services

BUSINESS NUMBER REQUEST

BUSINESS NUMBERS ACT, section 7

Telephone: 1 877 526-1526
www.bcreg.ca

Mailing Address: PO Box 9431 Stn Prov Govt
Victoria BC V8W 9V3

Courier Address: 200 – 940 Blanshard Street
Victoria BC V8W 3E6

INSTRUCTIONS:

Please type or print clearly in block letters.

The Province of British Columbia has entered into a partnership with the Canada Revenue Agency (CRA) to use the national Business Number (BN) as a convenient way for corporations to identify themselves when communicating with federal and provincial governments.

The Corporate Registry, under the authority of the *Business Number Act*, is therefore collecting the BN from both corporations applying for registration in British Columbia and corporations currently registered in British Columbia. This will allow corporations to use their BN as an identifier the next time they communicate with the Corporate Registry.

You will already have a BN if you have been incorporated federally or if you are incorporated in another Canadian jurisdiction.

You may have also received a BN from CRA if you:

- collect GST/HST;
- have employees;
- import or export goods to or from Canada;
- operate a taxi or limo service;
- are registered with WorkSafeBC, and/or;
- are registered to do business in another Canadian jurisdiction

Freedom of Information and Protection of Privacy Act (FOIPPA): Personal information provided on this form is collected, used and disclosed under the authority of the *FOIPPA* and the *Business Number Act* for the purposes of assessment. Questions regarding the collection, use and disclosure of personal information can be directed to the Manager of Registries Operations at 1 877 526-1526, PO Box 9431 Stn Prov Govt, Victoria BC V8W 9V3.

COMPLETE ITEM A OR B

A BUSINESS NUMBER

Your **Business Number** (e.g., GST/HST account) would be displayed as a 15 character identifier, for example: **82123 5679 RT 0001**. The first nine numbers uniquely identify your business – it's those numbers we need.

Please enter the first 9 digits here:

B DIRECTOR NAME

If you do not have a Business Number please enter the name of a director of your corporation (as per CRA requirements) so that we can request one for you. The director's name is confidential information and is collected under the authority of the *Business Number Act*.

LAST NAME	FIRST NAME
Leonard	Scott

FORM 01 BNA (AUG 2017)

Schedule "A"

to Continuance Application

Of TMC the metals company Inc.

To become a Company Subject to the

***Business Corporations Act* (British Columbia)**

DIRECTOR NAMES AND ADDRESSES	
Name of Director	Delivery Addresss
To be determined.	

Schedule "B"

to Continuance Application

Of TMC the metals company Inc.

To become a Company Subject to the

***Business Corporations Act* (British Columbia)**

AUTHORIZED SHARE STRUCTURE							
Identifying name of class or series of shares	Maximum number of shares of this class or series of shares that the company is authorized to issue or indicate there is		Kind of shares of this class or series of shares.			Are there special rights or restrictions attached to the shares of this class or series of shares?	
	THERE IS NO MAXIMUM ([X])	MAXIMUM NUMBER OF SHARES AUTHORIZED	WITHOUT PAR VALUE (X)	WITH A PAR VALUE OF ($)	Type of Currency	YES	NO
Common Shares	([X])		(X)			([X])	☐
Class A Special Shares		5,000,000	(X)			([X])	☐
Class B Special Shares		10,000,000	(X)			([X])	☐
Class C Special Shares		10,000,000	(X)			([X])	☐
Class D Special Shares		20,000,000	(X)			([X])	☐
Class E Special Shares		20,000,000	(X)			([X])	☐
Class F Special Shares		20,000,000	(X)			([X])	☐
Class G Special Shares		25,000,000	(X)			([X])	☐
Class H Special Shares		25,000,000	(X)			([X])	☐
Class I Special Shares		500,000	(X)			([X])	☐
Class J Special Shares		741,000	(X)			([X])	☐
Preferred Shares	([X])		(X)			([X])	☐

ANNEX C

Incorporation Number [•]

Translation of Name (if any)

PROVINCE OF BRITISH COLUMBIA

BUSINESS CORPORATIONS ACT

ARTICLES

OF

TMC THE METALS COMPANY INC.

Fasken Martineau DuMoulin LLP
Barristers & Solicitors
Canada

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PROVINCE OF BRITISH COLUMBIA

BUSINESS CORPORATIONS ACT

ARTICLES
OF
TMC THE METALS COMPANY INC.

(the "Company")

Incorporation Number [•]

Translation of Name (if any) _____

PART 1
INTERPRETATION

1.1 Definitions. Without limiting Article 1.2, in these Articles, unless the context requires otherwise:

"**adjourned meeting**" means the meeting to which a meeting is adjourned under Article 11.8 or 11.12;

"**board**", "board of directors" and "directors" mean the directors or sole director of the Company for the time being and include a committee or other delegate, direct or indirect, of the directors or director;

"***Business Corporations Act***" means the *Business Corporations Act*, S.B.C. 2002, c.57 as amended, restated or replaced from time to time, and includes its regulations;

"***Interpretation Act***" means the *Interpretation Act*, R.S.B.C. 1996, c. 238;

"**legal personal representative**" means the personal or other legal representative of the shareholder; and

"**seal**" means the seal of the Company, if any.

1.2 *Business Corporations Act* Definitions Apply. The definitions in the *Business Corporations Act* apply to these Articles.

1.3 *Interpretation Act* Applies. The *Interpretation Act* applies to the interpretation of these articles as if these Articles were an enactment.

1.4 Conflict in Definitions. If there is a conflict between a definition in the *Business Corporations Act* and a definition or rule in the *Interpretation Act* relating to a term used in these Articles, the definition in the *Business Corporations Act* will prevail in relation to the use of the term in these Articles.

1.5 Conflict Between Articles and Legislation. If there is a conflict between these Articles and the *Business Corporations Act*, the *Business Corporations Act* will prevail.

PART 2
SHARES AND SHARE CERTIFICATES

2.1 Authorized Share Structure. The authorized share structure of the Company consists of shares of the class or classes and series, if any, described in the Notice of Articles of the Company.

2.2 Form of Share Certificate. Each share certificate issued by the Company must comply with, and be signed as required by, the *Business Corporations Act*.

2.3 Right to Share Certificate or Acknowledgement. Each shareholder is entitled, without charge, to:

(a) one certificate representing the share or shares of each class or series of shares registered in the shareholder's name; or

(b) a non-transferable written acknowledgment of the shareholder's right to obtain such a share certificate,

provided that in respect of a share held jointly by several persons, the Company is not bound to issue more than one share certificate or acknowledgement and delivery of a share certificate or acknowledgment for a share to one of several joint shareholders or to one of the shareholder's duly authorized agents will be sufficient delivery to all. The Company may refuse to register more than three persons as joint holders of a share.

2.4 Sending of Share Certificate. Any share certificate or non-transferable written acknowledgment of the shareholder's right to obtain such a share certificate to which a shareholder is entitled may be sent to the shareholder by mail at the shareholder's registered address, and neither the Company nor any agent is liable for any loss to the shareholder because the share certificate or acknowledgment sent is lost in the mail or stolen.

2.5 Replacement of Worn Out or Defaced Certificate. If the board of directors, or any officer or agent designated by the directors, is satisfied that a share certificate is worn out or defaced, they must, on production to them of the certificate and on such other terms, if any, as they think fit:

(a) order the certificate to be cancelled; and

(b) issue a replacement share certificate.

2.6 Replacement of Lost, Stolen or Destroyed Certificate. If a share certificate is lost, stolen or destroyed, a replacement share certificate must be issued to the person entitled to that certificate if the board of directors, or any officer or agent designated by the directors, receives:

(a) proof satisfactory to them that the certificate is lost, stolen or destroyed; and

(b) any indemnity the board of directors, or any officer or agent designated by the directors, considers adequate.

2.7 Splitting Share Certificates. If a shareholder surrenders a share certificate to the Company with a written request that the Company issue in the shareholder's name two or more certificates, each representing a specified number of shares and in the aggregate representing the same number of shares as the certificate so surrendered, the Company must cancel the surrendered certificate and issue replacement share certificates in accordance with that request. The Company may refuse to issue a certificate with respect to a fraction of a share.

2.8 Certificate Fee. There must be paid to the Company, in relation to the issue of any share certificate under Articles 2.5, 2.6 or 2.7, the amount, if any and which must not exceed the amount prescribed under the *Business Corporations Act*, determined by the directors.

2.9 Recognition of Trusts. Except as required by law or statute or these Articles, no person will be recognized by the Company as holding any share upon any trust, and the Company is not bound by or compelled in any way to recognize (even when having notice thereof) any equitable, contingent, future or partial interest in any share or fraction of a share or (except as by law or statute or these Articles provided or as ordered by a court of competent jurisdiction) any other rights in respect of any share except an absolute right to the entirety thereof in the shareholder.

PART 3
ISSUE OF SHARES

3.1 Directors Authorized to Issue Shares. Subject to the *Business Corporations Act* and the rights of the holders of issued shares of the Company, the directors may issue, allot, sell or otherwise dispose of the unissued shares, and previously issued shares that are subject to reissuance or held by the Company, whether with par value or without par value, at the times, to the persons, including directors, in the manner, on the terms and conditions and for the issue prices (including any premium at which shares may be issued) that the directors, in their absolute discretion, may determine. The issue price for a share with par value must be equal to or greater than the par value of the share.

3.2 Commissions and Discounts. The directors may, at any time, authorize the Company to pay a reasonable commission or allow a reasonable discount to any person in consideration of that person purchasing or agreeing to purchase shares of the Company from the Company or any other person or procuring or agreeing to procure purchasers for shares of the Company.

3.3 Brokerage. The directors may authorize the Company to pay such brokerage fee or other consideration as may be lawful for or in connection with the sale or placement of its securities.

3.4 Conditions of Issue. Except as provided for by the *Business Corporations Act*, no share may be issued until it is fully paid. A share is fully paid when:

(a) consideration is provided to the Company for the issue of the share by one or more of the following:

(i) past services performed for the Company;

(ii) property; or

(iii) money; and

(b) the value of the consideration received by the Company equals or exceeds the issue price set for the share under Article 3.1.

3.5 Warrants, Options and Rights. Subject to the *Business Corporations Act*, the Company may issue warrants, options and rights upon such terms and conditions as the directors determine, which warrants, options and rights may be issued alone or in conjunction with debentures, debenture stock, bonds, shares or any other securities issued or created by the Company from time to time.

3.6 Fractional Shares. A person holding a fractional share does not have, in relation to the fractional share, the rights of a shareholder in proportion to the fraction of the share held.

PART 4
SHARE REGISTERS

4.1 Central Securities Register. As required by and subject to the *Business Corporations Act*, the Company must maintain in British Columbia a central securities register.

4.2 Branch Registers. In addition to the central securities register, the Company may maintain branch securities registers.

4.3 Appointment of Agents. The directors may, subject to the *Business Corporations Act*, appoint an agent to maintain the central securities register and any branch securities registers. The directors may also appoint one or more agents, including the agent which keeps the central securities register, as transfer agent for its shares or any class or series of its shares, as the case may be, and the same or another agent as registrar for its shares or such class or series of its shares, as the case may be. The directors may terminate such appointment of any agent at any time and may appoint another agent in its place.

4.4 Closing Register. The Company must not at any time close its central securities register.

PART 5
SHARE TRANSFERS

5.1 Recording or Registering Transfer. Except to the extent that the *Business Corporations Act* otherwise provides, a transfer of a share of the Company must not be recorded or registered unless:

(a) a duly signed instrument of transfer in respect of the share has been received by the Company;

(b) if a share certificate has been issued by the Company in respect of the share to be transferred, that share certificate has been surrendered to the Company; and

(c) if a non-transferable written acknowledgment of the shareholder's right to obtain a share certificate has been issued by the Company in respect of the share to be transferred, that acknowledgment has been surrendered to the Company.

5.2 Form of Instrument of Transfer. The instrument of transfer in respect of any share of the Company must be either in the form, if any, on the back of the Company's share certificates or in any other form that may be approved by the directors from time to time.

5.3 Transferor Remains Shareholder. Except to the extent that the *Business Corporations Act* otherwise provides, the transferor of shares is deemed to remain the holder of the shares until the name of the transferee is entered in a securities register of the Company in respect of the transfer.

5.4 Signing of Instrument of Transfer. If a shareholder, or his or her duly authorized attorney, signs an instrument of transfer in respect of shares registered in the name of the shareholder, the signed instrument of transfer constitutes a complete and sufficient authority to the Company and its directors, officers and agents to register the number of shares specified in the instrument of transfer, or, if no number is specified, all the shares represented by share certificates deposited with the instrument of transfer:

(a) in the name of the person named as transferee in that instrument of transfer; or

(b) if no person is named as transferee in that instrument of transfer, in the name of the person on whose behalf the share certificate is deposited for the purpose of having the transfer registered.

5.5 Enquiry as to Title Not Required. Neither the Company nor any director, officer or agent of the Company is bound to inquire into the title of the person named in the instrument of transfer as transferee or, if no person is named as transferee in the instrument of transfer, of the person on whose behalf the instrument is deposited for the purpose of having the transfer registered or is liable for any claim related to registering the transfer by the shareholder or by any intermediate owner or holder of the shares, of any interest in the shares, of any share certificate representing such shares or of any written acknowledgment of a right to obtain a share certificate for such shares.

5.6 Transfer Fee. Subject to the applicable rules of any stock exchange on which the shares of the Company may be listed, there must be paid to the Company, in relation to the registration of any transfer, the amount determined by the directors.

PART 6
TRANSMISSION OF SHARES

6.1 Legal Personal Representative Recognized on Death. In the case of the death of a shareholder, the legal personal representative, or if the shareholder was a joint holder, the surviving joint holder, will be the only person recognized by the Company as having any title to the shareholder's interest in the shares. Before recognizing a person as a legal personal representative, the directors may require proof of appointment by a court of competent jurisdiction, a grant of letters probate, letters of administration or such other evidence or documents as the directors consider appropriate.

6.2 Rights of Legal Personal Representative. The legal personal representative has the same rights, privileges and obligations that attach to the shares held by the shareholder, including the right to transfer the shares in accordance with these Articles, provided the documents required by the *Business Corporations Act* and the directors have been deposited with the Company.

PART 7
PURCHASE OF SHARES

7.1 Company Authorized to Purchase Shares. Subject to the special rights and restrictions attached to any class or series of shares and the *Business Corporations Act*, the Company may, if authorized by the directors, purchase or otherwise acquire any of its shares at the price and on the terms specified in such resolution.

7.2 Purchase When Insolvent. The Company must not make a payment or provide any other consideration to purchase or otherwise acquire any of its shares if there are reasonable grounds for believing that:

(a) the Company is insolvent; or

(b) making the payment or providing the consideration would render the Company insolvent.

7.3 Sale and Voting of Purchased Shares. If the Company retains a share redeemed, purchased or otherwise acquired by it, the Company may sell, gift or otherwise dispose of the share, but, while such share is held by the Company, it:

(a) is not entitled to vote the share at a meeting of its shareholders;

(b) must not pay a dividend in respect of the share; and

(c) must not make any other distribution in respect of the share.

PART 8
BORROWING POWERS

8.1 Powers of Directors. The Company, if authorized by the directors, may from time to time:

(a) borrow money in the manner and amount, on the security, from the sources and on the terms and conditions that the directors consider appropriate;

(b) issue bonds, debentures and other debt obligations either outright or as security for any liability or obligation of the Company or any other person;

(c) guarantee the repayment of money by any other person or the performance of any obligation of any other person; and

(d) mortgage or charge, whether by way of specific or floating charge, or give other security on the whole or any part of the present and future undertaking of the Company.

8.2 Terms of Debt Instruments. Any bonds, debentures or other debt obligations of the Company may be issued at a discount, premium or otherwise, and with any special privileges on the redemption, surrender, drawing, allotment of or conversion into or exchange for shares or other securities, attending and voting at general meetings of the Company, appointment of directors or otherwise, and may by their terms be assignable free from any equities between the Company and the person to whom they were issued or any subsequent holder, all as the directors may determine.

8.3 Delegation by Directors. For greater certainty, the powers of the directors under this Part 8 may be exercised by a committee or other delegate, direct or indirect, of the board authorized to exercise such powers.

PART 9
ALTERATIONS

9.1 Alteration of Authorized Share Structure. Subject to Article 9.2 and the *Business Corporations Act*, the Company may:

(a) by ordinary resolution:

(i) create one or more classes or series of shares or, if none of the shares of a class or series of shares is allotted or issued, eliminate that class or series of shares;

(ii) increase, reduce or eliminate the maximum number of shares that the Company is authorized to issue out of any class or series of shares or establish a maximum number of shares that the Company is authorized to issue out of any class or series of shares for which no maximum is established;

(iii) subdivide or consolidate all or any of its unissued, or fully paid issued, shares;

(iv) if the Company is authorized to issue shares of a class of shares with par value:

(A) decrease the par value of those shares; or

(B) if none of the shares of that class of shares is allotted or issued, increase the par value of those shares;

(v) change all or any of its unissued, or fully paid issued, shares with par value into shares without par value or any of its unissued shares without par value into shares with par value;

(vi) alter the identifying name of any of its shares; or

(vii) otherwise alter its shares or authorized share structure when required or permitted to do so by the *Business Corporations Act*.; or

(b) by directors' resolution, subdivide or consolidate all or any of its unissued, or fully paid issued, shares.

9.2 Special Rights and Restrictions. Subject to the *Business Corporations Act*, the Company may by ordinary resolution:

(a) create special rights or restrictions for, and attach those special rights or restrictions to, the shares of any class or series of shares, whether or not any or all of those shares have been issued; or

(b) vary or delete any special rights or restrictions attached to the shares of any class or series of shares, whether or not any or all of those shares have been issued.

9.3 Change of Name. The Company may by directors' resolution or ordinary resolution authorize an alteration of its Notice of Articles in order to change its name.

9.4 Company Alterations. If the *Business Corporations Act* does not specify the type of resolution and these Articles do not specify a type of resolution, the Company may by ordinary resolution authorize any act of the Company, including without limitation, an alteration of these Articles or its Notice of Articles.

PART 10
MEETINGS OF SHAREHOLDERS

10.1 Annual General Meetings. Unless an annual general meeting is deferred or waived in accordance with the *Business Corporations Act*, the Company must hold an annual general meeting, for the first time, not more than 18 months after the date on which it was recognized, and after its first annual reference date, at least once in each calendar year and not more than 15 months after the annual reference date for the preceding calendar year at such date, time and location as may be determined by the directors.

10.2 Resolution Instead of Annual General Meeting. If all of the shareholders who are entitled to vote at an annual general meeting consent by a unanimous resolution under the *Business Corporations Act* to all of the business that is required to be transacted at that annual general meeting, the annual general meeting is deemed to have been held on the date of the unanimous resolution. The shareholders must, in any unanimous resolution passed under this Article 10.2, select as the Company's annual reference date a date that would be appropriate for the holding of the applicable annual general meeting.

10.3 Calling of Shareholder Meetings. The directors may, whenever they think fit, call a meeting of shareholders.

10.4 Location of Shareholder Meetings. The directors may by directors' resolution, approve a location outside of British Columbia for the holding of a meeting of shareholders.

10.5 Notice for Meetings of Shareholders. The Company must send notice of the date, time and location of any meeting of shareholders, in the manner provided in these Articles, or in such other manner, if any, as may

be prescribed by ordinary resolution (whether previous notice of the resolution has been given or not), to each shareholder entitled to attend the meeting, to each director and to the auditor of the Company, unless these Articles otherwise provide, at least the following number of days before the meeting:

(a) if and for so long as the Company is a public company, 21 days; and

(b) otherwise, 10 days.

10.6 Record Date for Notice. The directors may set a date as the record date for the purpose of determining shareholders entitled to notice of any meeting of shareholders. The record date must not precede the date on which the meeting is to be held by more than two months or, in the case of a general meeting requisitioned by shareholders under the *Business Corporations Act*, by more than four months. The record date must not precede the date on which the meeting is held by fewer than:

(a) if and for so long as the Company is a public company, 21 days; and

(b) otherwise, 10 days.

If no record date is set, the record date is 5 p.m. on the day immediately preceding the first date on which the notice is sent or, if no notice is sent, the beginning of the meeting.

10.7 Record Date for Voting. The directors may set a date as the record date for the purpose of determining shareholders entitled to vote at any meeting of shareholders. The record date must not precede the date on which the meeting is to be held by more than two months or, in the case of a general meeting requisitioned by shareholders under the *Business Corporations Act*, by more than four months. If no record date is set, the record date is 5 p.m. on the day immediately preceding the first date on which the notice is sent or, if no notice is sent, the beginning of the meeting.

10.8 Failure to Give Notice and Waiver of Notice. The accidental omission to send notice of any meeting to, or the non-receipt of any notice by, any of the persons entitled to receive notice does not invalidate any proceedings at that meeting. Any person entitled to receive notice of a meeting of shareholders may, in writing or otherwise, waive or reduce the period of notice of such meeting.

10.9 Notice of Special Business at Meetings of Shareholders. If a meeting of shareholders is to consider special business within the meaning of Article 11.1, the notice of meeting must:

(a) state the general nature of the special business; and

(b) if the special business includes considering, approving, ratifying, adopting or authorizing any document or the signing of or giving of effect to any document, have attached to it a copy of the document or state that a copy of the document will be available for inspection by the shareholders:

(i) at the Company's records office, or at such other reasonably accessible location in British Columbia as is specified in the notice; and

(ii) during statutory business hours on any one or more specified days before the day set for the holding of the meeting.

10.10 Class Meetings and Series Meetings of Shareholders. Unless otherwise specified in these Articles, the provisions of these Articles relating to a meeting of shareholders will apply with the necessary changes and so far as they are applicable, to a class meeting or series meeting of shareholders holding a particular class or series of shares.

10.11 Notice of Dissent Rights. The Company must send to each of its shareholders, whether or not their shares carry the right to vote, a notice of any meeting of shareholders at which a resolution entitling shareholders to dissent is to be considered specifying the date of the meeting and containing a statement advising of the right to send a notice of dissent together with a copy of the proposed resolution at least the following number of days before the meeting:

(a) if and for so long as the Company is a public company, 21 days;

(b) otherwise, 10 days.

PART 11
PROCEEDINGS AT MEETINGS OF SHAREHOLDERS

11.1 Special Business. At a meeting of shareholders, the following business is special business:

(a) at a meeting of shareholders that is not an annual general meeting, all business is special business except business relating to the conduct of or voting at the meeting;

(b) at an annual general meeting, all business is special business except for the following:

(i) business relating to the conduct of, or voting at, the meeting;

(ii) consideration of any financial statements of the Company presented to the meeting;

(iii) consideration of any reports of the directors or auditor;

(iv) the setting or changing of the number of directors;

(v) the election or appointment of directors;

(vi) the appointment of an auditor;

(vii) business arising out of a report of the directors not requiring the passing of a special resolution or an exceptional resolution; and

(viii) any other business which, under these Articles or the *Business Corporations Act*, may be transacted at a meeting of shareholders without prior notice of the business being given to the shareholders.

11.2 Special Majority. The majority of votes required for the Company to pass a special resolution at a meeting of shareholders is two-thirds of the votes cast on the resolution.

11.3 Quorum. Subject to the special rights and restrictions attached to the shares of any class or series of shares, the quorum for the transaction of business at a meeting of shareholders is two persons who are, or who represent by proxy, shareholders who, in the aggregate, hold at least 5% of the issued shares entitled to be voted at the meeting.

11.4 One Shareholder May Constitute Quorum. If there is only one shareholder entitled to vote at a meeting of shareholders:

(a) the quorum is one person who is, or who represents by proxy, that shareholder; and

(b) that shareholder, present in person or by proxy, may constitute the meeting.

11.5 Meetings by Telephone or Other Communications Medium. A shareholder or proxy holder who is entitled to participate in, including vote at, a meeting of shareholders may participate in person or by telephone or other communications medium if all shareholders and proxy holders participating in the meeting, whether in person or by telephone or other communications medium, are able to communicate with each other. A shareholder who participates in a meeting in a manner contemplated by this Article 11.5 is deemed for all purposes of the *Business Corporations Act* and these Articles to be present at the meeting and to have agreed to participate in that manner. Nothing in this Article 11.5 obligates the Company to take any action or provide any facility to permit or facilitate the use of any communications mediums at a meeting of shareholders.

11.6 Other Persons May Attend. The directors, the president (if any), the secretary (if any), the assistant secretary (if any), any lawyer for the Company, the auditor of the Company and any other persons invited by the directors are entitled to attend any meeting of shareholders, but if any of those persons does attend a meeting of shareholders, that person is not to be counted in the quorum, and is not entitled to vote at the meeting, unless that person is a shareholder or proxy holder entitled to vote at the meeting.

11.7 Requirement of Quorum. No business, other than the election of a chair of the meeting and the adjournment of the meeting, may be transacted at any meeting of shareholders unless a quorum of shareholders entitled to vote is present at the commencement of the meeting.

11.8 Lack of Quorum. If, within one-half hour from the time set for the holding of a meeting of shareholders, a quorum is not present:

(a) in the case of a general meeting convened by requisition of shareholders, the meeting is dissolved; and

(b) in the case of any other meeting of shareholders, the meeting stands adjourned to the same day in the next week at the same time and place, or at such other date, time or location as the chair specifies on the adjournment.

11.9 Lack of Quorum at Succeeding Meeting. If, at the meeting to which the first meeting referred to in Article 11.8(b) was adjourned, a quorum is not present within one-half hour from the time set for the holding of the meeting the person or persons present and being, or representing by proxy, one or more shareholders entitled to attend and vote at the meeting constitute a quorum.

11.10 Chair. The following individual is entitled to preside as chair at a meeting of shareholders:

(a) the chair of the board, if any; and

(b) if the chair of the board is absent or unwilling to act as chair of the meeting, the president, if any.

11.11 Selection of Alternate Chair. If, at any meeting of shareholders, there is no chair of the board or president present within 15 minutes after the time set for holding the meeting, or if the chair of the board and the president are unwilling to act as chair of the meeting, or if the chair of the board and the president have advised the secretary, if any, or any director present at the meeting, that they will not be present at the meeting, the directors present must choose one of their number to be chair of the meeting or if all of the directors present decline to take the chair or fail to so choose or if no director is present, the shareholders entitled to vote at the meeting who are present in person or by proxy may choose any person present at the meeting to chair the meeting.

11.12 Adjournments. The chair of a meeting of shareholders may, and if so directed by the meeting must, adjourn the meeting from time to time and from place to place, but no business may be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.

11.13 Notice of Adjourned Meeting. It is not necessary to give any notice of an adjourned meeting or of the business to be transacted at an adjourned meeting of shareholders except that, when a meeting is adjourned for 30 days or more, notice of the adjourned meeting must be given as in the case of the original meeting.

11.14 Decisions by Show of Hands or Poll. Subject to the *Business Corporations Act*, every motion put to a vote at a meeting of shareholders will be decided on a show of hands or the functional equivalent of a show of hands by means of telephonic, electronic or other communications facilities, unless a poll, before or on the declaration of the result of the vote by show of hands (or its functional equivalent), is directed by the chair or demanded by at least one shareholder entitled to vote who is present in person or by proxy.

11.15 Declaration of Result. The chair of a meeting of shareholders must declare to the meeting the decision on every question in accordance with the result of the show of hands (or its functional equivalent) or the poll, as the case may be, and that decision must be entered in the minutes of the meeting. A declaration of the chair that a resolution is carried by the necessary majority or is defeated is, unless a poll is directed by the chair or demanded under Article 11.14, conclusive evidence without proof of the number or proportion of the votes recorded in favour of or against the resolution.

11.16 Motion Need Not Be Seconded. No motion proposed at a meeting of shareholders need be seconded unless the chair of the meeting rules otherwise, and the chair of any meeting of shareholders is entitled to propose or second a motion.

11.17 Casting Vote. In case of an equality of votes, the chair of a meeting of shareholders does not, either on a show of hands or on a poll, have a second or casting vote in addition to the vote or votes to which the chair may be entitled as a shareholder.

11.18 Manner of Taking a Poll. Subject to Article 11.19, if a poll is duly demanded at a meeting of shareholders:

(a) the poll must be taken:

(i) at the meeting, or within seven days after the date of the meeting, as the chair of the meeting directs; and

(ii) in the manner, at the time and at the place that the chair of the meeting directs;

(b) the result of the poll is deemed to be a resolution of and passed at the meeting at which the poll is demanded; and

(c) the demand for the poll may be withdrawn by the person who demanded it.

11.19 Demand for a Poll on Adjournment. A poll demanded at a meeting of shareholders on a question of adjournment must be taken immediately at the meeting.

11.20 Chair Must Resolve Dispute. In the case of any dispute as to the admission or rejection of a vote given on a poll, the chair of the meeting must determine the dispute, and his or her determination made in good faith is final and conclusive.

11.21 Casting of Votes. On a poll, a shareholder entitled to more than one vote need not cast all the votes in the same way.

11.22 Demand for Poll. No poll may be demanded in respect of the vote by which a chair of a meeting of shareholders is elected.

11.23 Demand for a Poll Not to Prevent Continuation of Meeting. The demand for a poll at a meeting of shareholders does not, unless the chair of the meeting so rules, prevent the continuation of a meeting for the transaction of any business other than the question on which a poll has been demanded.

11.24 Retention of Ballots and Proxies. The Company must, for at least three months after a meeting of shareholders, keep each ballot cast on a poll and each proxy voted at the meeting, and, during that period, make them available for inspection during statutory business hours by any shareholder or proxy holder entitled to vote at the meeting. At the end of such three month period, the Company may destroy such ballots and proxies.

11.25 Electronic Voting. Any vote at a meeting of shareholders may be held entirely or partially by means of telephonic, electronic or other communications facilities if the directors determine to make them available whether or not persons entitled to attend participate in the meeting by means of telephonic, electronic or other communications facilities.

PART 12
VOTES OF SHAREHOLDERS

12.1 Number of Votes by Shareholder or by Shares. Subject to any special rights or restrictions attached to any shares and to the restrictions imposed on joint registered holders of shares under Article 12.3:

(a) on a vote by show of hands (or its functional equivalent), every person present who is a shareholder or proxy holder and entitled to vote at the meeting has one vote, and

(b) on a poll, every shareholder entitled to vote at the meeting has one vote in respect of each share held by that shareholder and may exercise that vote either in person or by proxy.

12.2 Votes of Persons in Representative Capacity. A person who is not a shareholder may vote at a meeting of shareholders, whether on a show of hands or on a poll, and may appoint a proxy holder to act at the meeting, if, before doing so, the person satisfies the chair of the meeting, or the directors, that the person is the legal personal representative or a trustee in bankruptcy for a shareholder who is entitled to vote at the meeting.

12.3 Votes by Joint Shareholders. If there are joint shareholders registered in respect of any share:

(a) any one of the joint shareholders may vote at any meeting, either personally or by proxy, in respect of the share as if that joint shareholder were solely entitled to it; or

(b) if more than one of the joint shareholders is present at any meeting, personally or by proxy, and more than one of them votes in respect of that share, then only the vote of the joint shareholder present whose name stands first on the central securities register in respect of the share will be counted.

12.4 Legal Personal Representatives as Joint Shareholders. Two or more legal personal representatives of a shareholder in whose sole name any share is registered are, for the purposes of Article 12.3, deemed to be joint shareholders.

12.5 Representative of a Corporate Shareholder. If a corporation that is not a subsidiary of the Company is a shareholder, that corporation may appoint a person to act as its representative at any meeting of shareholders of the Company, and:

(a) for that purpose, the instrument appointing a representative must:

(i) be received at the registered office of the Company or at any other place specified, in the notice calling the meeting, for the receipt of proxies, at least the number of business days specified in the notice for the receipt of proxies or, if no number is specified, two days before the day set for the holding of the meeting; or

(ii) be provided, at the meeting, to the chair of the meeting or to a person designated by the chair of the meeting; and

(b) if a representative is appointed under this Article 12.5:

(i) the representative is entitled to exercise in respect of and at that meeting the same rights on behalf of the corporation that the representative represents as that corporation could exercise if it were a shareholder who is an individual, including, without limitation, the right to appoint a proxy holder; and

(ii) the representative, if present at the meeting, is to be counted for the purpose of forming a quorum and is deemed to be a shareholder present in person at the meeting.

Evidence of the appointment of any such representative may be sent to the Company by written instrument, fax or any other method of transmitting legibly recorded messages.

12.6 Proxy Provisions Do Not Apply to All Companies. If and for so long as it is a public company, Articles 12.7 to 12.15 apply only insofar as they are not inconsistent with any Canadian securities legislation applicable to the Company, any U.S. securities legislation applicable to the Company or any rules of an exchange on which securities of the Company are listed.

12.7 Appointment of Proxy Holder. Every shareholder of the Company, including a corporation that is a shareholder but not a subsidiary of the Company, entitled to vote at a meeting of shareholders of the Company may, by proxy, appoint one or more (but not more than five) proxy holders to attend and act at the meeting in the manner, to the extent and with the powers conferred by the proxy.

12.8 Alternate Proxy Holders. A shareholder may appoint one or more alternate proxy holders to act in the place of an absent proxy holder.

12.9 When Proxy Holder Need Not Be Shareholder. A person must not be appointed as a proxy holder unless the person is a shareholder, although a person who is not a shareholder may be appointed as a proxy holder if:

(a) the person appointing the proxy holder is a corporation or a representative of a corporation appointed under Article 12.5;

(b) the Company has at the time of the meeting for which the proxy holder is to be appointed only one shareholder entitled to vote at the meeting;

(c) the shareholders present in person or by proxy at and entitled to vote at the meeting for which the proxy holder is to be appointed, by a resolution on which the proxy holder is not entitled to vote but in respect of which the proxy holder is to be counted in the quorum, permit the proxy holder to attend and vote at the meeting; or

(d) the Company is a public company.

12.10 Deposit of Proxy. A proxy for a meeting of shareholders must:

(a) be received at the registered office of the Company or at any other place specified, in the notice calling the meeting, for the receipt of proxies, at least the number of business days specified in the notice, or if no number of days is specified, two business days before the day set for the holding of the meeting; or

(b) unless the notice provides otherwise, be provided, at the meeting, to the chair of the meeting or to a person designated by the chair of the meeting.

A proxy may be sent to the Company by written instrument, fax or any other method of transmitting legibly recorded messages.

12.11 Validity of Proxy Vote. A vote given in accordance with the terms of a proxy is valid notwithstanding the death or incapacity of the shareholder giving the proxy and despite the revocation of the proxy or the revocation of the authority under which the proxy is given, unless notice in writing of that death, incapacity or revocation is received:

(a) at the registered office of the Company, at any time up to and including the last business day before the day set for the holding of the meeting at which the proxy is to be used; or

(b) by the chair of the meeting, before the vote is taken.

12.12 Form of Proxy. A proxy, whether for a specified meeting or otherwise, must be either in the following form or in any other form approved by the directors or the chair of the meeting:

[Name of Company]
(the "Company")

The undersigned, being a shareholder of the Company, hereby appoints [name] or, failing that person, [name], as proxy holder for the undersigned to attend, act and vote for and on behalf of the undersigned at the meeting of shareholders to be held on [month, day, year] and at any adjournment of that meeting.

Number of shares in respect of which this proxy is given (if no number is specified, then this proxy is given in respect of all shares registered in the name of the shareholder): _____

Signed this _____ day of _____, _____.

_____
Signature of shareholder

_____
Name of shareholder—printed

12.13 Revocation of Proxy. Subject to Article 12.14, every proxy may be revoked by an instrument in writing that is:

(a) received at the registered office of the Company at any time up to and including the last business day before the day set for the holding of the meeting at which the proxy is to be used; or

(b) provided, at the meeting, to the chair of the meeting.

12.14 Revocation of Proxy Must Be Signed. An instrument referred to in Article 12.13 must be signed as follows:

(a) if the shareholder for whom the proxy holder is appointed is an individual, the instrument must be signed by the shareholder or his or her legal personal representative or trustee in bankruptcy; or

(b) if the shareholder for whom the proxy holder is appointed is a corporation, the instrument must be signed by the corporation or by a representative appointed for the corporation under Article 12.5.

12.15 Production of Evidence of Authority to Vote. The chair of any meeting of shareholders may, but need not, inquire into the authority of any person to vote at the meeting and may, but need not, demand from that person production of evidence as to the existence of the authority to vote.

PART 13
DIRECTORS

13.1 Number of Directors. The number of directors, excluding additional directors appointed under Article 14.8, is set at:

(a) if the Company is a public company, the greater of three and the most recently set of:

(i) the number of directors set by ordinary resolution (whether or not previous notice of the resolution was given); and

(ii) the number of directors set under Article 14.4;

(b) if the Company is not a public company, the most recently set of:

(i) the number of directors set by ordinary resolution (whether or not previous notice of the resolution was given); and

(ii) the number of directors set under Article 14.4.

13.2 Change in Number of Directors. If the number of directors is set under Articles 13.1(a)(i) or 13.1(b)(i):

(a) the shareholders may elect or appoint the directors needed to fill any vacancies in the board of directors up to that number;

(b) if the shareholders do not elect or appoint the directors needed to fill any vacancies in the board of directors up to that number contemporaneously with the setting of that number, then the directors may appoint, or the shareholders may elect or appoint, directors to fill those vacancies.

13.3 Directors' Acts Valid Despite Vacancy. An act or proceeding of the directors is not invalid merely because fewer than the number of directors set or otherwise required under these Articles is in office.

13.4 Qualifications of Directors. A director is not required to hold a share in the capital of the Company as qualification for his or her office but must be qualified as required by the *Business Corporations Act* to become, act or continue to act as a director.

13.5 Remuneration of Directors. The directors are entitled to the remuneration for acting as directors, if any, as the directors may from time to time determine. If the directors so decide, the remuneration of the directors, if any, will be determined by the shareholders. That remuneration may be in addition to any salary or other remuneration paid to any officer or employee of the Company as such, who is also a director.

13.6 Reimbursement of Expenses of Directors. The Company must reimburse each director for the reasonable expenses that he or she may incur in his or her capacity as director in and about the business of the Company.

13.7 Special Remuneration for Directors. If any director performs any professional or other services for the Company that in the opinion of the directors are outside the ordinary duties of a director, or if any director is otherwise specially occupied in or about the Company's business, he or she may be paid remuneration fixed by the directors, or, at the option of that director, fixed by ordinary resolution, and such remuneration may be either in addition to, or in substitution for, any other remuneration that he or she may be entitled to receive.

13.8 Gratuity, Pension or Allowance on Retirement of Director. Unless otherwise determined by ordinary resolution, the directors may authorize the Company to pay a gratuity or pension or allowance on retirement to any director who has held any salaried office or place of profit with the Company or to his or her spouse or dependants and may make contributions to any fund and pay premiums for the purchase or provision of any such gratuity, pension or allowance.

PART 14
ELECTION AND REMOVAL OF DIRECTORS

14.1 Election at Annual General Meeting. At every annual general meeting and in every unanimous resolution contemplated by Article 10.2:

(a) the shareholders entitled to vote at the annual general meeting for the election of directors must elect, or in the unanimous resolution appoint, a board of directors consisting of the number of directors for the time being set under these Articles; and

(b) all the directors cease to hold office immediately before the election or appointment of directors under paragraph (a), but are eligible for re-election or re-appointment.

14.2 Consent to be a Director. No election, appointment or designation of an individual as a director is valid unless:

(a) that individual consents to be a director in the manner provided for in the *Business Corporations Act*; or

(b) that individual is elected or appointed at a meeting at which the individual is present and the individual does not refuse, at the meeting, to be a director.

14.3 Failure to Elect or Appoint Directors. If:

(a) the Company fails to hold an annual general meeting, and all the shareholders who are entitled to vote at an annual general meeting fail to pass the unanimous resolution contemplated by Article 10.2, on or before the date by which the annual general meeting is required to be held under the *Business Corporations Act*; or

(b) the shareholders fail, at the annual general meeting or in the unanimous resolution contemplated by Article 10.2, to elect or appoint any directors;

then each director then in office continues to hold office until the earlier of:

(c) the date on which his or her successor is elected or appointed; and

(d) the date on which he or she otherwise ceases to hold office under the *Business Corporations Act* or these Articles.

14.4 Places of Retiring Directors Not Filled. If, at any meeting of shareholders at which there should be an election of directors, the places of any of the retiring directors are not filled by that election, those retiring directors who are not re-elected and who are asked by the newly elected directors to continue in office will, if willing to do so, continue in office to complete the number of directors for the time being set pursuant to these Articles until further new directors are elected at a meeting of shareholders convened for that purpose. If any such election or continuance of directors does not result in the election or continuance of the number of directors for the time being set pursuant to these Articles, the number of directors of the Company is deemed to be set at the number of directors actually elected or continued in office.

14.5 Directors May Fill Casual Vacancies. Any casual vacancy occurring in the board of directors may be filled by the directors.

14.6 Remaining Directors Power to Act. The directors may act notwithstanding any vacancy in the board of directors, but if the Company has fewer directors in office than the number set pursuant to these Articles as the

quorum of directors, the directors may only act for the purpose of appointing directors up to that number or of summoning a meeting of shareholders for the purpose of filling any vacancies on the board of directors or, subject to the *Business Corporations Act*, for any other purpose.

14.7 Shareholders May Fill Vacancies. If the Company has no directors or fewer directors in office than the number set pursuant to these Articles as the quorum of directors, the shareholders may elect or appoint directors to fill any vacancies on the board of directors.

14.8 Additional Directors. Notwithstanding Articles 13.1 and 13.2, between annual general meetings or unanimous resolutions contemplated by Article 10.2, the directors may appoint one or more additional directors, but the number of additional directors appointed under this Article 14.8 must not at any time exceed:

(a) one-third of the number of first directors, if, at the time of the appointments, one or more of the first directors have not yet completed their first term of office; or

(b) in any other case, one-third of the number of the current directors who were elected or appointed as directors other than under this Article 14.8.

Any director so appointed ceases to hold office immediately before the next election or appointment of directors under Article 14.1(a), but is eligible for re-election or re-appointment.

14.9 Ceasing to be a Director. A director ceases to be a director when:

(a) the term of office of the director expires;

(b) the director dies;

(c) the director resigns as a director by notice in writing provided to the Company or a lawyer for the Company; or

(d) the director is removed from office pursuant to Articles 14.10 or 14.11.

14.10 Removal of Director by Shareholders. The Company may remove any director before the expiration of his or her term of office by ordinary resolution. In that event, the shareholders may elect, or appoint by ordinary resolution, a director to fill the resulting vacancy. If the shareholders do not elect or appoint a director to fill the resulting vacancy contemporaneously with the removal, then the directors may appoint or the shareholders may elect, or appoint by ordinary resolution, a director to fill that vacancy.

14.11 Removal of Director by Directors. The board may remove any director before the expiration of his or her term of office if the director is convicted of an indictable offence, or if the director ceases to be qualified to act as a director of a company in accordance with the *Business Corporations Act* and does not promptly resign, and the board may appoint a director to fill the resulting vacancy.

PART 15
ADVANCE NOTICE REQUIREMENTS

15.1 Definitions. In this Part 15, unless the context otherwise requires:

(a) "**Applicable Securities Laws**" means the applicable securities statutes of each relevant state, province and territory of the United States and Canada, as applicable, as amended from time to time, the rules, regulations and forms made or promulgated under any such statute and the published national instruments, multilateral instruments, policies, bulletins and notices of the securities commission and similar regulatory authority of each relevant state, province and territory of the United States and Canada;

(b) "**Person**" includes an individual, firm, association, trustee, executor, administrator, legal or personal representative, body corporate, company, corporation, trust, partnership, limited partnership, joint venture, syndicate or other form of unincorporated association, a government and its agencies or instrumentalities, any entity or group (whether or not having legal personality), any successor (by merger, statutory amalgamation or otherwise) and any of the foregoing acting in any derivative, representative or fiduciary capacity;

(c) **"Public Announcement"** shall mean disclosure in a press release reported by a national news service in the United States, or in a document publicly filed by the Company with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Securities Exchange Act of 1934, as amended.

15.2 Nomination of Directors. Only Persons who are eligible under the *Business Corporations Act* and who are nominated in accordance with the provisions herein shall be eligible for election as directors of the Company. At any annual general meeting of shareholders, or any special meeting of shareholders if one of the purposes for which the special meeting was called is the election of directors, nominations of Persons for election to the Board may be made only:

(a) by or at the direction of the Board, including pursuant to a notice of meeting;

(b) by or at the direction or request of one or more shareholders pursuant to a "proposal" made in accordance with Part 5, Division 7 of the *Business Corporations Act*, or pursuant to a requisition of the shareholders made in accordance with Section 167 of the *Business Corporations Act*; or

(c) by any Person (a "Nominating Shareholder"): (i) who, at the close of business on the date that the Nominating Shareholder's Notice (as defined below) is given and at the close of business on the record date for notice of such meeting, is entered in the securities register of the Company as a holder of one or more shares carrying the right to vote at such meeting or who beneficially owns shares that are entitled to be voted at such meeting and provides evidence of such ownership that is satisfactory to the Company, acting reasonably; and (ii) who complies with all notice procedures set forth herein.

15.3 Timely Notice. In addition to any other requirements under applicable laws, for a nomination to be made by a Nominating Shareholder, the Nominating Shareholder must have given notice thereof that is both timely (in accordance with Article 15.4 below) and in proper written form (in accordance with Article 15.8 below) to the Corporate Secretary of the Company at the registered office of the Company (as set out in Article 15.8 of this Part 15).

15.4 Manner of Timely Notice. To be timely, the Nominating Shareholder's Notice to the Corporate Secretary of the Company must be made:

(a) in the case of an annual general meeting of shareholders, not less than thirty (30) days prior to the date of the annual general meeting of shareholders; provided, however, that in the event that the annual general meeting of shareholders is to be held on a date that is less than fifty (50) days after the date (the "Notice Date") on which the first Public Announcement of the date of the annual general meeting was made, the Nominating Shareholder's Notice may be made not later than the close of business on the tenth (10^{th}) day following the Notice Date; and

(b) in the case of a special meeting (which is not also an annual general meeting) of shareholders called for the purpose of electing directors (whether or not called for other purposes), not later than the close of business on the fifteenth (15^{th}) day following the day on which the first Public Announcement of the date of the special meeting of shareholders was made,

15.5 Proper Form of Timely Notice. To be in proper written form, a Nominating Shareholder's notice to the Corporate Secretary of the Company must set forth:

(a) as to each Person whom the Nominating Shareholder proposes to nominate for election as a director: (i) the name, age, business address and residential address of the Person; (ii) the present principal occupation or employment of the Person and the principal occupation or employment within the five years preceding the notice; (iii) the country of residence of the Person; (iv) the class or series and number of shares in the capital of the Company which are directly or indirectly controlled or directed or which are owned beneficially or of record by the Person as of the record date for the annual general meeting of shareholders, or the special meeting of shareholders if one of the purposes for which the special meeting was called is the election of directors, (if such date shall then have been made publicly available and shall have occurred) and as of the date of such notice; (iv) full particulars regarding any agreements between the Person and/or the Nominating

Shareholder and/or any other person or company relating to the Person's nomination for election as a director of the Company; and (v) any other information relating to the Person that would be required to be disclosed in a dissident's proxy circular in connection with solicitations of proxies for election of directors pursuant to the *Business Corporations Act* and Applicable Securities Laws; and

(b) as to the Nominating Shareholder giving the notice, full particulars regarding any proxy, contract, agreement, arrangement, understanding or relationship pursuant to which such Nominating Shareholder has a right to vote any shares of the Company and any other information relating to such Nominating Shareholder that would be required to be made in a dissident's proxy circular in connection with solicitations of proxies for election of directors pursuant to the Act and Applicable Securities Laws; (collectively with Article 15.5(a), the "Nominating Shareholder's Notice").

The Company may require any proposed nominee to furnish such other information as may be required to be contained in a dissident's proxy circular or by Applicable Securities Laws to determine the independence of the Proposed Nominee or the eligibility of such proposed nominee to serve as a director of the Company.

15.6 Notice to be Updated. To be considered timely and in proper written form, the Nominating Shareholder's Notice will be promptly updated and supplemented, if necessary, so that the information provided or required to be provided in such Nominating Shareholder's Notice will be true and correct as of the record date for the annual general meeting of shareholders, or the special meeting of shareholders if one of the purposes for which the special meeting was called is the election of directors.

15.7 Eligibility for Nomination as a Director. No Person shall be eligible for election as a director of the Company (except pursuant to Article 15.2(a) unless nominated in accordance with the provisions of this Part 15; provided, however, that nothing in this Part 15 shall be deemed to preclude discussion by a shareholder (as distinct from the nomination of directors) at any annual general meeting of shareholders, or any special meeting of shareholders if one of the purposes for which the special meeting was called is the election of directors, of any matter in respect of which it would have been entitled to submit a proposal pursuant to the provisions of the *Business Corporations Act* or at the discretion of the Chair of the Board. The Chair of the Board of the meeting shall have the power and duty to determine whether a nomination was made in accordance with the procedures set forth in this Part 15, and, if any proposed nomination is not in compliance with such provisions, to declare that such defective nomination shall be deemed voided and subsequently disregarded.

15.8 Delivery of Notice. Notwithstanding any other provision in this Part 15, notice given to the Corporate Secretary of the Company pursuant to this Part 15 may only be given by personal delivery, facsimile transmission or email (provided that the Corporate Secretary has stipulated an e-mail address for purposes of this Part 15), and shall be deemed to have been given and received only at the time it is served by personal delivery or sent by facsimile transaction (provided that receipt of confirmation of such transmission has been received) or by e-mail (at the address as aforesaid) to the Corporate Secretary at the registered office of the Company as follows:

[•]

Fax: [•]

provided that if such delivery or electronic transmission is made on a day which is not a business day or later than 5:00 p.m. (Vancouver time) on a day which is a business day, then such delivery or electronic transmission shall be deemed to have been made on the subsequent day that is a business day.

15.9 Board's Discretion. Notwithstanding the foregoing, the Board may, in its sole discretion, waive any and all requirements in this Part 15.

PART 16
FORUM FOR ADJUDICATION OF CERTAIN DISPUTES

16.1 Forum Selection. Unless the Company consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada and the appellate Courts therefrom (collectively, the "**Courts**"), shall, to the fullest extent permitted by law, be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company; (ii) any action or proceeding asserting a claim of breach of a fiduciary duty owed by any director, officer, or other employee of the Company to the Company; (iii) any action or proceeding asserting a claim arising pursuant to any provision of the *Business Corporations Act* or these

Articles or the Notice of Articles (as may be amended from time to time); or (iv) any action or proceeding asserting a claim otherwise related to the relationships among the Company, its affiliates and the shareholders, directors and officers of such corporations (but does not include the business carried on by such corporations). If any action or proceeding the subject matter of which is within the scope of the preceding sentence is filed in a Court other than a Court located within the Province of British Columbia (a "**Foreign Action**") in the name of any registered or beneficial securityholder of the Company, such securityholder shall be deemed to have consented to (i) the personal jurisdiction of the Courts in connection with any action or proceeding brought in any such Court to enforce foregoing exclusive forum provision (an "**Enforcement Action**") and (ii) having service of process made upon such securityholder in any such Enforcement Action by service upon such securityholder's counsel in the Foreign Action as agent for such securityholder. For the avoidance of doubt, this Part 16 shall not apply to any action brought to enforce a duty or liability created by the U.S. Securities Act of 1933, as amended, or the U.S. Securities Exchange Act of 1934, as amended. Unless the Company consents in writing to the selection of an alternative forum, the federal district courts of the United States of America shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the U.S. Securities Act of 1933, as amended. Any person or entity purchasing or otherwise acquiring any interest in any security of the Company shall be deemed to have notice of and consented to the provisions of this Part 16.

PART 17
POWERS AND DUTIES OF DIRECTORS

17.1 Powers of Management. The directors must, subject to the *Business Corporations Act* and these Articles, manage or supervise the management of the business and affairs of the Company and have the authority to exercise all such powers of the Company as are not, by the *Business Corporations Act* or by these Articles, required to be exercised by the shareholders of the Company.

17.2 Appointment of Attorney of Company. The directors exclusively may from time to time, by power of attorney or other instrument, under seal if so required by law, appoint any person to be the attorney of the Company for such purposes, and with such powers, authorities and discretions (not exceeding those vested in or exercisable by the directors under these Articles and excepting the power to fill vacancies in the board of directors, to remove a director, to change the membership of, or fill vacancies in, any committee of the directors, to appoint or remove officers appointed by the directors and to declare dividends) and for such period, and with such remuneration and subject to such conditions as the directors may think fit. Any such power of attorney may contain such provisions for the protection or convenience of persons dealing with such attorney as the directors think fit. Any such attorney may be authorized by the directors to sub-delegate all or any of the powers, authorities and discretions for the time being vested in him or her.

PART 18
DISCLOSURE OF INTEREST OF DIRECTORS

18.1 Obligation to Account for Profits. A director or senior officer who holds a disclosable interest (as that term is used in the *Business Corporations Act*) in a contract or transaction into which the Company has entered or proposes to enter is liable to account to the Company for any profit that accrues to the director or senior officer under or as a result of the contract or transaction only if and to the extent provided in the *Business Corporations Act*.

18.2 Restrictions on Voting by Reason of Interest. A director who holds a disclosable interest in a contract or transaction into which the Company has entered or proposes to enter is not entitled to vote on any directors' resolution to approve that contract or transaction, unless all the directors have a disclosable interest in that contract or transaction, in which case any or all of those directors may vote on such resolution.

18.3 Interested Director Counted in Quorum. A director who holds a disclosable interest in a contract or transaction into which the Company has entered or proposes to enter and who is present at the meeting of directors at which the contract or transaction is considered for approval may be counted in the quorum at the meeting whether or not the director votes on any or all of the resolutions considered at the meeting.

18.4 Disclosure of Conflict of Interest or Property. A director or senior officer who holds any office or possesses any property, right or interest that could result, directly or indirectly, in the creation of a duty or interest that materially conflicts with that individual's duty or interest as a director or senior officer, must disclose the nature and extent of the conflict as required by the *Business Corporations Act*.

18.5 Director Holding Other Office in the Company. A director may hold any office or place of profit with the Company, other than the office of auditor of the Company, in addition to his or her office of director for the period and on the terms (as to remuneration or otherwise) that the directors may determine.

18.6 No Disqualification. No director or intended director is disqualified by his or her office from contracting with the Company either with regard to the holding of any office or place of profit the director holds with the Company or as vendor, purchaser or otherwise, and no contract or transaction entered into by or on behalf of the Company in which a director is in any way interested is liable to be voided for that reason.

18.7 Professional Services by Director or Officer. Subject to the *Business Corporations Act*, a director or officer, or any person in which a director or officer has an interest, may act in a professional capacity for the Company, except as auditor of the Company, and the director or officer or such person is entitled to remuneration for professional services as if that director or officer were not a director or officer.

18.8 Director or Officer in Other Corporations. A director or officer may be or become a director, officer or employee of, or otherwise interested in, any person in which the Company may be interested as a shareholder or otherwise, and, subject to the *Business Corporations Act*, the director or officer is not accountable to the Company for any remuneration or other benefits received by him or her as director, officer or employee of, or from his or her interest in, such other person.

PART 19
PROCEEDINGS OF DIRECTORS

19.1 Meetings of Directors. The directors may meet together for the conduct of business, adjourn and otherwise regulate their meetings as they think fit, and meetings of the board held at regular intervals may be held at the place, at the time and on the notice, if any, that the board may by resolution from time to time determine.

19.2 Voting at Meetings. Questions arising at any meeting of directors are to be decided by a majority of votes and, in the case of an equality of votes, the chair of the meeting does not have a second or casting vote.

19.3 Chair of Meetings. Meetings of directors are to be chaired by:

(a) the chair of the board, if any;

(b) in the absence of the chair of the board, the president, if any, if the president is a director; or

(c) any other director chosen by the directors if:

(i) neither the chair of the board nor the president, if a director, is present at the meeting within 15 minutes after the time set for holding the meeting;

(ii) neither the chair of the board nor the president, if a director, is willing to chair the meeting; or

(iii) the chair of the board and the president, if a director, have advised the secretary, if any, or any other director, that they will not be present at the meeting.

19.4 Meetings by Telephone or Other Communications Medium. A director may participate in a meeting of the directors or of any committee of the directors in person or by telephone or other communications medium if all directors participating in the meeting, whether in person or by telephone or other communications medium, are able to communicate with each other. A director who participates in a meeting in a manner contemplated by this Article 19.4 is deemed for all purposes of the *Business Corporations Act* and these Articles to be present at the meeting and to have agreed to participate in that manner.

19.5 Calling of Meetings. A director may, and the secretary or an assistant secretary, if any, on the request of a director must, call a meeting of the directors at any time.

19.6 Notice of Meetings. Other than for meetings held at regular intervals as determined by the directors pursuant to Article 19.1, reasonable notice of each meeting of the directors, specifying the place, day and time of that meeting must be given to each of the directors by any method set out in Article 25.1 or orally or by telephone.

19.7 When Notice Not Required. It is not necessary to give notice of a meeting of the directors to a director if:

(a) the meeting is to be held immediately following a meeting of shareholders at which that director was elected or appointed or is the meeting of the directors at which that director is appointed; or

(b) the director has waived notice of the meeting.

19.8 Meeting Valid Despite Failure to Give Notice. The accidental omission to give notice of any meeting of directors to any director, or the non-receipt of any notice by any director, does not invalidate any proceedings at that meeting.

19.9 Waiver of Notice of Meetings. Any director may file with the Company a document signed by the director waiving notice of any past, present or future meeting of the directors and may at any time withdraw that waiver with respect to meetings of the directors held after that withdrawal. After sending a waiver with respect to all future meetings of the directors, and until that waiver is withdrawn, no notice of any meeting of the directors need be given to that director and all meetings of the directors so held are deemed not to be improperly called or constituted by reason of notice not having been given to such director.

19.10 Quorum. The quorum necessary for the transaction of the business of the directors may be set by the directors and, if not so set, is deemed to be set at a majority of the directors.

19.11 Validity of Acts Where Appointment Defective. Subject to the *Business Corporations Act*, an act of a director or officer is not invalid merely because of an irregularity in the election or appointment or a defect in the qualification of that director or officer.

19.12 Consent Resolutions in Writing. A resolution of the directors or of any committee of the directors consented to in writing by all of the directors entitled to vote on it, whether by signed document, fax, email or any other method of transmitting legibly recorded messages, is as valid and effective as if it had been passed at a meeting of the directors or of the committee of the directors duly called and held. Such resolution may be in two or more counterparts which together are deemed to constitute one resolution in writing. A resolution passed in that manner is effective on the date stated in the resolution or, if no date is stated in the resolution, on the latest date stated on any counterpart. A resolution of the directors or of any committee of the directors passed in accordance with this Article 19.12 is deemed to be a proceeding at a meeting of directors or of the committee of the directors and to be as valid and effective as if it had been passed at a meeting of the directors or of the committee of the directors that satisfies all the requirements of the *Business Corporations Act* and all the requirements of these Articles relating to meetings of the directors or of a committee of the directors.

PART 20
EXECUTIVE AND OTHER COMMITTEES

20.1 Appointment and Powers of Executive Committee. The directors may, by resolution, appoint an executive committee consisting of the director or directors that they consider appropriate, and this committee has, during the intervals between meetings of the board of directors, all of the directors' powers, except:

(a) the power to fill vacancies in the board of directors;

(b) the power to remove a director;

(c) the power to change the membership of, or fill vacancies in, any committee of the directors; and

(d) such other powers, if any, as may be set out in the resolution or any subsequent directors' resolution.

20.2 Appointment and Powers of Other Committees. The directors may, by resolution,

(a) appoint one or more committees (other than the executive committee) consisting of the director or directors that they consider appropriate;

(b) delegate to a committee appointed under paragraph (a) any of the directors' powers, except:

(i) the power to fill vacancies in the board of directors;

(ii) the power to remove a director;

(iii) the power to change the membership of, or fill vacancies in, any committee of the board, and

(iv) the power to appoint or remove officers appointed by the board; and

(c) make any delegation referred to in paragraph (b) subject to the conditions set out in the resolution.

20.3 Obligations of Committee. Any committee appointed under Articles 20.1 or 20.2, in the exercise of the powers delegated to it, must

(a) conform to any rules that may from time to time be imposed on it by the directors; and

(b) report every act or thing done in exercise of those powers as the directors may require.

20.4 Powers of Board. The directors may, at any time, with respect to a committee appointed under Articles 20.1 or 20.2:

(a) revoke or alter the authority given to a committee, or override a decision made by a committee, except as to acts done before such revocation, alteration or overriding;

(b) terminate the appointment of, or change the membership of, a committee; and

(c) fill vacancies on a committee.

20.5 Committee Meetings. Subject to Article 20.3(a) and unless the directors otherwise provide in the resolution appointing the committee or in any subsequent resolution, with respect to a committee appointed under Articles 20.1 or 20.2:

(a) the committee may meet and adjourn as it thinks proper;

(b) the committee may elect a chair of its meetings but, if no chair of the meeting is elected, or if at any meeting the chair of the meeting is not present within 15 minutes after the time set for holding the meeting, the directors present who are members of the committee may choose one of their number to chair the meeting;

(c) a majority of the members of a directors' committee constitutes a quorum of the committee; and

(d) questions arising at any meeting of the committee are determined by a majority of votes of the members present, and in case of an equality of votes, the chair of the meeting has no second or casting vote.

PART 21
OFFICERS

21.1 Appointment of Officers. The directors may, from time to time, appoint such officers, if any, as the directors determine, and the directors may, at any time, terminate any such appointment.

21.2 Functions, Duties and Powers of Officers. The directors may, for each officer:

(a) determine the functions and duties of the officer;

(b) entrust to and confer on the officer any of the powers exercisable by the directors on such terms and conditions and with such restrictions as the directors think fit; and

(c) revoke, withdraw, alter or vary all or any of the functions, duties and powers of the officer.

21.3 Qualifications. No officer may be appointed unless that officer is qualified in accordance with the *Business Corporations Act*. One person may hold more than one position as an officer of the Company. Any officer need not be a director.

21.4 Remuneration. All appointments of officers are to be made on the terms and conditions and at the remuneration (whether by way of salary, fee, commission, participation in profits or otherwise) that the directors think fit and are subject to termination at the pleasure of the directors, and an officer may in addition to such remuneration be entitled to receive, after he or she ceases to hold such office or leaves the employment of the Company, a pension or gratuity.

PART 22
INDEMNIFICATION

22.1 Definitions. In this Part 22:

(a) "**eligible penalty**" means a judgment, penalty or fine awarded or imposed in, or an amount paid in settlement of, an eligible proceeding;

(b) "**eligible proceeding**" means a legal proceeding or investigative action, whether current, threatened, pending or completed, in which a director, former director of the Company or an affiliate of the Company (an "eligible party") or any of the heirs and legal personal representatives of the eligible party, by reason of the eligible party being or having been a director of the Company or an affiliate of the Company:

(i) is or may be joined as a party; or

(ii) is or may be liable for or in respect of a judgment, penalty or fine in, or expenses related to, the proceeding;

(c) "**expenses**" has the meaning set out in the *Business Corporations Act*.

22.2 Mandatory Indemnification of Directors and Former Directors. Subject to the *Business Corporations Act*, the Company must indemnify and advance expenses of a director or former director of the Company and his or her heirs and legal personal representatives against all eligible penalties to which such person is or may be liable, and the Company must, after the final disposition of an eligible proceeding, pay the expenses actually and reasonably incurred by such person in respect of that proceeding. Each director is deemed to have contracted with the Company on the terms of the indemnity contained in this Article 22.2.

22.3 Indemnification of Other Persons. Subject to any restrictions in the *Business Corporations Act*, the Company may indemnify any person.

22.4 Non-Compliance with *Business Corporations Act*. The failure of a director or former director of the Company to comply with the *Business Corporations Act* or these Articles does not invalidate any indemnity to which he or she is entitled under this Part.

22.5 Company May Purchase Insurance. The Company may purchase and maintain insurance for the benefit of any person (or his or her heirs or legal personal representatives) who:

(a) is or was a director, officer, employee or agent of the Company;

(b) is or was a director, officer, employee or agent of a corporation at a time when the corporation is or was an affiliate of the Company;

(c) at the request of the Company, is or was a director, officer, employee or agent of a corporation or of a partnership, trust, joint venture or other unincorporated entity;

(d) at the request of the Company, holds or held a position equivalent to that of a director or officer of a partnership, trust, joint venture or other unincorporated entity;

against any liability incurred by him or her as such director, officer, employee or agent or person who holds or held such equivalent position.

PART 23
DIVIDENDS

23.1 Payment of Dividends Subject to Special Rights. The provisions of this Part 23 are subject to the rights, if any, of shareholders holding shares with special rights as to dividends.

23.2 Declaration of Dividends. Subject to the *Business Corporations Act*, the directors may from time to time declare and authorize payment of such dividends as they may deem advisable.

23.3 No Notice Required. The directors need not give notice to any shareholder of any declaration under Article 23.2.

23.4 Record Date. The directors may set a date as the record date for the purpose of determining shareholders entitled to receive payment of a dividend. The record date must not precede the date on which the dividend is to be paid by more than two months. If no record date is set, the record date is 5 p.m. on the date on which the directors pass the resolution declaring the dividend.

23.5 Manner of Paying Dividend. A resolution declaring a dividend may direct payment of the dividend wholly or partly by the distribution of specific assets or of paid up shares or of bonds, debentures or other securities of the Company, or in any one or more of those ways.

23.6 Settlement of Difficulties. If any difficulty arises in regard to a distribution under Article 23.5, the directors may settle the difficulty as they deem advisable, and, in particular, may:

(a) set the value for distribution of specific assets;

(b) determine that cash payments in substitution for all or any part of the specific assets to which any shareholders are entitled may be made to any shareholders on the basis of the value so fixed in order to adjust the rights of all parties; and

(c) vest any such specific assets in trustees for the persons entitled to the dividend.

23.7 When Dividend Payable. Any dividend may be made payable on such date as is fixed by the directors.

23.8 Dividends to be Paid in Accordance with Number of Shares. All dividends on shares of any class or series of shares must be declared and paid according to the number of such shares held.

23.9 Receipt by Joint Shareholders. If several persons are joint shareholders of any share, any one of them may give an effective receipt for any dividend, bonus or other money payable in respect of the share.

23.10 Dividend Bears No Interest. No dividend bears interest against the Company.

23.11 Fractional Dividends. If a dividend to which a shareholder is entitled includes a fraction of the smallest monetary unit of the currency of the dividend, that fraction may be disregarded in making payment of the dividend and that payment represents full payment of the dividend.

23.12 Payment of Dividends. Any dividend or other distribution payable in respect of shares will be paid by cheque or by electronic means or by such other method as the directors may determine. The payment will be made to or to the order of each registered holder of shares in respect of which the payment is to be made. Cheques will be sent to the registered address of the shareholder unless the shareholder otherwise directs. In the case of joint holders, the payment will be made to the order of all such joint holders and, if applicable, sent to them at the registered address of the joint shareholder who is first named on the central securities register, unless such joint holders otherwise direct. The sending of the cheque or the sending of the payment by electronic means or the sending of the payment by a method determined by the directors in an amount equal to the dividend or other distribution to be paid less any tax that the Company is required to withhold will satisfy and discharge the liability for the payment, unless payment is not made upon presentation, if applicable, or the amount of tax so deducted is not paid to the appropriate taxing authority.

23.13 Capitalization of Surplus. Notwithstanding anything contained in these Articles, the directors may from time to time capitalize any surplus of the Company and may from time to time issue, as fully paid, shares or any bonds, debentures or other securities of the Company as a dividend representing the surplus or any part of the surplus.

23.14 Unclaimed Dividends. Any dividend unclaimed after a period of six years from the date on which the same has been declared to be payable shall be forfeited and shall revert to the Company. The Company shall not be liable to any person in respect of any dividend which is forfeited to the Company or delivered to any public official pursuant to any applicable abandoned property, escheat or similar law

PART 24
DOCUMENTS, RECORDS AND REPORTS

24.1 Recording of Financial Affairs. The directors must cause adequate accounting records to be kept to record properly the financial affairs and condition of the Company and to comply with the provisions of the *Business Corporations Act*.

24.2 Inspection of Accounting Records. Unless the directors determine otherwise, or unless otherwise determined by ordinary resolution, no shareholder of the Company is entitled to inspect or obtain a copy of any accounting records of the Company.

24.3 Remuneration of Auditors. The remuneration of the auditors, if any, shall be set by the directors regardless of whether the auditor is appointed by the shareholders, by the directors or otherwise. For greater certainty, the directors may delegate to the audit committee or other committee the power to set the remuneration of the auditors.

PART 25
NOTICES

25.1 Method of Giving Notice. Unless the *Business Corporations Act* or these Articles provides otherwise, a notice, statement, report or other record required or permitted by the *Business Corporations Act* or these Articles to be sent by or to a person may be sent by any one of the following methods:

(a) mail addressed to the person at the applicable address for that person as follows:

(i) for a record mailed to a shareholder, the shareholder's registered address;

(ii) for a record mailed to a director or officer, the prescribed address for mailing shown for the director or officer in the records kept by the Company or the mailing address provided by the recipient for the sending of that record or records of that class;

(iii) in any other case, the mailing address of the intended recipient;

(b) delivery at the applicable address for that person as follows, addressed to the person:

(i) for a record delivered to a shareholder, the shareholder's registered address;

(ii) for a record delivered to a director or officer, the prescribed address for delivery shown for the director or officer in the records kept by the Company or the delivery address provided by the recipient for the sending of that record or records of that class;

(iii) in any other case, the delivery address of the intended recipient;

(c) sending the record by fax to the fax number provided by the intended recipient for the sending of that record or records of that class;

(d) sending the record, or a reference providing the intended recipient with immediate access to the record, by electronic communication to an address provided by the intended recipient for the sending of that record or records of that class;

(e) sending the record by any method of transmitting legibly recorded messages, including without limitation by digital medium, magnetic medium, optical medium, mechanical reproduction or graphic imaging, to an address provided by the intended recipient for the sending of that record or records of that class; or

(f) physical delivery to the intended recipient.

25.2 Deemed Receipt. A record that is mailed to a person by ordinary mail to the applicable address for that person referred to in Article 25.1 is deemed to be received by the person to whom it was mailed on the day, Saturdays, Sundays and holidays excepted, following the date of mailing. Any demand, notice or other communication given by personal delivery will be conclusively deemed to have been given on the day of actual delivery thereof and, if given by electronic communication, on the day of transmittal thereof if given during statutory business hours on the day which statutory business hours next occur if not given during such hours on any day.

25.3 Certificate of Sending. A certificate signed by the secretary, if any, or other officer of the Company or of any other corporation acting in that behalf for the Company stating that a notice, statement, report or other record was addressed as required by Article 25.1, prepaid and mailed or otherwise sent as permitted by Article 25.1 is conclusive evidence of that fact.

25.4 Notice to Joint Shareholders. A notice, statement, report or other record may be provided by the Company to the joint shareholders of a share by providing the notice to the joint shareholder first named in the central securities register in respect of the share.

25.5 Notice to Trustees. A notice, statement, report or other record may be provided by the Company to the persons entitled to a share in consequence of the death, bankruptcy or incapacity of a shareholder by:

(a) mailing the record, addressed to them:

(i) by name, by the title of the legal personal representative of the deceased or incapacitated shareholder, by the title of trustee of the bankrupt shareholder or by any similar description; and

(ii) at the address, if any, supplied to the Company for that purpose by the persons claiming to be so entitled; or

(b) if an address referred to in paragraph (a)(ii) has not been supplied to the Company, by giving the notice in a manner in which it might have been given if the death, bankruptcy or incapacity had not occurred.

PART 26
SEAL

26.1 Who May Attest Seal. Except as provided in Articles 26.2 and 26.3, the Company's seal, if any, must not be impressed on any record except when that impression is attested by the signature or signatures of:

(a) any two directors;

(b) any officer, together with any director;

(c) if the Company only has one director, that director; or

(d) any one or more directors or officers or persons as may be determined by resolution of the directors.

26.2 Sealing Copies. For the purpose of certifying under seal a certificate of incumbency of the directors or officers of the Company or a true copy of any resolution or other document, despite Article 26.1, the impression of the seal may be attested by the signature of any director or officer.

26.3 Mechanical Reproduction of Seal. The directors may authorize the seal to be impressed by third parties on share certificates or bonds, debentures or other securities of the Company as they may determine appropriate from time to time. To enable the seal to be impressed on any share certificates or bonds, debentures or other securities of the Company, whether in definitive or interim form, on which facsimiles of any of the signatures of the directors or officers of the Company are, in accordance with the *Business Corporations Act* or these Articles, printed or otherwise mechanically reproduced, there may be delivered to the person employed to engrave, lithograph or print such definitive or interim share certificates or bonds, debentures or other securities one or more unmounted dies reproducing the seal and the chair of the board or any senior officer together with the secretary, treasurer, secretary-treasurer, an assistant secretary, an assistant treasurer or an assistant secretary-treasurer may in writing authorize such person to cause the seal to be impressed on such definitive or interim share certificates or bonds, debentures or other securities by the use of such dies. Share certificates or bonds, debentures or other securities to which the seal has been so impressed are for all purposes deemed to be under and to bear the seal impressed on them.

PART 27
PROHIBITIONS

27.1 Definitions. In this Part 27:

(a) "**designated security**" means:

(i) a voting security of the Company;

(ii) a security of the Company that is not a debt security and that carries a residual right to participate in the earnings of the Company or, on the liquidation or winding up of the Company, in its assets; or

(iii) a security of the Company convertible, directly or indirectly, into a security described in paragraph (a) or (b);

(b) "**security**" has the meaning assigned in the ***Securities Act*** (British Columbia);

(c) "**voting security**" means a security of the Company that:

(i) is not a debt security, and

(ii) carries a voting right either under all circumstances or under some circumstances that have occurred and are continuing.

27.2 Application. Except as otherwise contemplated in Article 30.5, Article 27.3 does not apply to the Company if and for so long as it is a public company.

27.3 Consent Required for Transfer of Shares or Designated Securities. No share or designated security may be sold, transferred or otherwise disposed of without the consent of the directors and the directors are not required to give any reason for refusing to consent to any such sale, transfer or other disposition.

PART 28
DEFINITIONS

28.1 Definitions In Part 28, Part 29, Part 30, Part 31, and Part 32 of these Articles:

(a) "**Affiliate**" means, with respect to any Person, any other Person who directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such Person. The term "control" means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of a Person, whether through the ownership of voting securities, by contract or otherwise, and the terms "controlled" and "controlling" have meanings correlative thereto.

(b) "**Automatic Conversion**" means the automatic conversion into Common Shares of the Class A Special Shares, Class B Special Shares, Class C Special Shares, Class D Special Shares, Class E Special Shares, Class F Special Shares, Class G Special Shares, Class H Special Shares, Class I Special Shares or Class J Special Shares, as applicable, each in accordance with the terms and conditions set forth in Part 31 of these Articles.

(c) "**Automatic Conversion Date**" has the meaning set forth in Article 31.11.

(d) "**Change of Control**" means any transaction or series of related transactions (x) under which any Person or one or more Persons that are Affiliates or that are acting as a "group" (as defined in Section 13(d)(3) of the Exchange Act), directly or indirectly, acquires or otherwise purchases (i) the Company or (ii) all or a material portion of assets, businesses or Equity Securities of the Company or (y) that results, directly or indirectly, in the shareholders of the Company as of immediately prior to such transaction holding, in the aggregate, less than fifty percent (50%) of the voting Equity Securities of the Company immediately after the consummation thereof (excluding, for the avoidance of doubt, any Special Shares and the Common Shares issuable upon conversion

thereof pursuant to Part 31) (in the case of each of clause (x) and (y), whether by amalgamation, merger, consolidation, arrangement, tender offer, recapitalization, purchase or issuance of Equity Securities or otherwise).

(e) "**Class A Special Shares**" means the Class A Special Shares in the capital of the Company.

(f) "**Class B Special Shares**" means the Class B Special Shares in the capital of the Company.

(g) "**Class C Special Shares**" means the Class C Special Shares in the capital of the Company.

(h) "**Class D Special Shares**" means the Class D Special Shares in the capital of the Company.

(i) "**Class E Special Shares**" means the Class E Special Shares in the capital of the Company.

(j) "**Class F Special Shares**" means the Class F Special Shares in the capital of the Company.

(k) "**Class G Special Shares**" means the Class G Special Shares in the capital of the Company.

(l) "**Class H Special Shares"** means the Class H Special Shares in the capital of the Company.

(m) "**Class I Special Shares"** means the Class I Special Shares in the capital of the Company.

(n) "**Class J Special Shares"** means the Class J Special Shares in the capital of the Company.

(o) "**Common Shares**" means the common shares in the capital of the Company.

(p) "**Conversion Rate**" has the meaning set forth in Article 30.6.

(q) "**Equity Securities**" means the Common Shares, the Preferred Shares, the Special Shares or any other class of shares or series thereof in the capital of the Company or similar interest in the Company (including any stock appreciation, phantom stock, profit participation or similar rights), and any option, warrant, right or security (including debt securities) convertible, exchangeable or exercisable therefor.

(r) "**Exchange Act**" means the United States Securities Exchange Act of 1934.

(s) "**holder**" of any share referred to herein means the holder of such share as registered on the central securities register of the Company and, in respect of shares held by joint holders, means all such joint holders.

(t) "**Letter of Transmittal**" means the letter of transmittal executed and delivered by holders of securities of DeepGreen Metals Inc. as a condition to obtaining Equity Securities arising from or in connection with the Business Combination Agreement (the "**BCA**") between DeepGreen Metals Inc., 1291924 B.C. Unlimited Liability Company and the Company dated as of March 4, 2021 (including, for greater certainty, Equity Securities issued pursuant to the exercise of Rollover Options (as defined therein) after the completion of the transactions contemplated therein).

(u) "**Liquidation Distribution**" means a distribution of assets of the Company among its shareholders arising on the liquidation, dissolution or winding up of the Company, whether voluntary or involuntary, or any other distribution of the assets of the Company among its shareholders for the purpose of winding up its affairs.

(v) "**Original Issue Date**" means the date, on or about [•], 2021, on which the first Special Share is issued.

(w) "**Permitted Transfer**" means, in respect of a proposed Transfer by a holder of Special Shares:

(i) in the case of an individual, by gift to a member of one of the individual's immediate family, to a trust, the beneficiaries of which are members of the individual's immediate family or an Affiliate of such individual, in each case for estate planning purposes;

(ii) in the case of an individual, by virtue of laws of descent and distribution upon death of the individual;

(iii) in the case of an individual, pursuant to a qualified domestic relations order;

(iv) by virtue of the holder's organizational documents upon liquidation or dissolution of the holder; or

(v) subject to the provisions of Article 30.5, a Transfer to the officers or directors of such holder, the members or partners of such holder, any Affiliates of such holder or any employee of such Affiliate.

(x) "**Permitted Transferee**" means any transferee arising from a Permitted Transfer.

(y) "**Preferred Shares**" means the preferred shares in the capital of the Company, issuable in series.

(z) "**Redemption Price**" with respect to each Class A Special Share, Class B Special Share, Class C Special Share, Class D Special Share, Class E Special Share, Class F Special Share, Class G Special Share, Class H Special Share, Class I Special Share and Class J Special Share, shall be equal to US$0.00000000001 per share.

(aa) "**Redemption Time**" has the meaning set forth in Article 30.4.

(bb) "Person" means an individual, partnership, corporation, limited liability company, joint stock company, unincorporated organization or association, trust, joint venture or other similar entity, whether or not a legal entity.

(cc) "**Special Shares**" means, collectively, the Class A Special Shares, Class B Special Shares, Class C Special Shares, Class D Special Shares, Class E Special Shares, Class F Special Shares, Class G Special Shares, Class H Special Shares, Class I Special Shares and Class J Special Shares.

(dd) "**Trading Day**" means any day on which Common Shares are actually traded on the principal securities exchange or securities market on which Common Shares are then traded.

(ee) "**Transfer**" means any, direct or indirect, sale, transfer, assignment, pledge, mortgage, exchange, hypothecation, grant of a security interest or encumbrance in or disposition of an interest (whether with or without consideration, whether voluntarily or involuntarily or by operation of law or otherwise, provided that a Permitted Transfer as contemplated in Article 28.1(w)(i) and Article 28.1(w)(v) shall be without consideration or for nominal consideration).

PART 29
COMMON SHARES

29.1 Voting The holders of the Common Shares shall be entitled to one vote for each Common Share held at all meetings of shareholders of the Company, other than meetings at which only the holders of another class or series of shares are entitled to vote separately as a class or series.

29.2 Dividends Subject to the prior rights of the Preferred Shares and any other class ranking senior to the Common Shares, the holders of the Common Shares shall be entitled to receive and the Company shall pay thereon, as and when declared by the directors of the Company out of moneys of the Company properly applicable to the payment of dividends, such non-cumulative dividends as the directors may from time to time declare.

29.3 Liquidation Distribution In the event of any Liquidation Distribution, subject to the prior rights of the holders of Special Shares, the holders of the Preferred Shares of all series and the holders of the shares of any other class ranking senior to the Common Shares, the holders of the Common Shares shall be entitled to receive all remaining property and assets of the Company.

PART 30
SPECIAL SHARES

30.1 Non-Voting The holders of the Special Shares shall not be entitled to any voting rights except as otherwise required under the Business Corporations Act.

30.2 Dividends The holders of the Special Shares shall not be entitled to any dividends or other distributions other than a Liquidation Distribution.

30.3 Liquidation Distribution In the event of any Liquidation Distribution, the holders of Special Shares shall be entitled to receive, before any repayment of capital or any distribution of any part of the assets of the Company to the holders of the Common Shares, and any shares ranking junior to the Special Shares, an amount per Special Share equal to the Redemption Price. After payment to the holders of the Special Shares of the amount so payable to them as above provided, the holders of the Special Shares shall not be entitled to share in any further distribution of the property or assets of the Company.

30.4 Redemption Subject to Section 79 of the Business Corporations Act, the Company shall:

(a) at any time after the 15th year anniversary of the Original Issue Date; or

(b) at any time after a Change of Control;

without notice, redeem at any time the whole of the then outstanding Special Shares on payment, in respect of each Special Share to be redeemed, of the Redemption Price thereon (provided that the ability to redeem Special Shares shall not apply in respect of any Special Shares which are automatically converted into Common Shares in accordance with the provisions of Part 31).

Subject to Section 79 of the *Business Corporations Act*, in the event that any holder of Special Shares breaches any covenant of such holder, in respect of its ownership of the Special Shares, contained in the Letter of Transmittal, such holder's Special Shares shall be deemed to be immediately redeemed, without notice or formality, whereupon such holder shall cease to hold any rights in respect of such Special Shares and shall only be entitled to receive an amount equal to the aggregate of the Redemption Price in respect of such holder's Special Shares. Any such redemption of Special Shares shall be immediate upon the occurrence of such breach (the "**Redemption Time**"), and such holder's only rights in respect thereof shall be to receive the Redemption Price in respect of such Special Shares. For greater certainty, after the Redemption Time, the rights in respect of Special Shares of such holder shall no longer be exercisable by such holder in respect thereof. The Company shall thereafter deliver to such holder of Special Shares the Redemption Price thereon.

30.5 Limits on Transferability None of the Special Shares may be Transferred without the prior approval of the board of directors, which shall only be given if:

(a) the board of directors is satisfied that the Transfer is a Permitted Transfer; and

(b) the transferring holder and the Permitted Transferee enter into a written agreement in form and substance reasonably satisfactory to the Company providing such assurances as the Company may require relating to, among other things:

(i) the eligibility of the Transfer as a Permitted Transfer;

(ii) the Permitted Transferee's acknowledgement of the transfer restrictions in respect of the Special Shares being transferred; and

(iii) the Permitted Transferee's agreement to be bound by all of the covenants, agreements and obligations of the transferring holder to the Company in respect of (x) matters relating to the Special Shares and (y) the transferring holder's ownership of the Special Shares.

The Company shall not register, and no holder shall have any right to request, any Transfer of the registered ownership of any Special Shares without such approval. For greater certainty, no holder shall be entitled to pledge, mortgage, exchange, hypothecate or grant a security interest or encumbrance in any Special Shares.

Notwithstanding the foregoing, any holder or proposed holder of Special Shares may, at such Person's option, at any time (whether before or after the issuance of any Special Shares to such Person) provide an irrevocable direction and agreement (the "**Direction**") in favour of the Company (which Direction may be contained in the Letter of Transmittal or in a separate document delivered to the Company), that a proposed Transfer contemplated in Article 28.1(w)(v) shall be deemed not be a Permitted Transfer in respect of any Special Shares held or proposed to be held by such Person (and, for greater certainty, such Direction may (but need not) also provide that any other proposed Transfer contemplated in Article 28.1(w)(v) shall be conditional upon the proposed transferee executing an identical Direction), whereupon the Company shall thereafter disregard any request by such Person for a Transfer to be made pursuant to Article 28.1(w)(v) unless such request complies with such Direction.

30.6 Conversion Provisions Unless and until adjusted as provided for in this Article 30.6, for all conversions of Special Shares, each Special Share shall be converted into Common Shares on a 1:1 basis (the "Conversion Rate").

(a) No fractional Common Shares shall be issued upon conversion of the Special Shares. All Common Shares (including fractions thereof) issuable upon conversion of more than one Special Share by a holder thereof shall be aggregated for the purpose of determining whether the conversion would result in the issuance of any fractional share. If, after the aforementioned aggregation, the conversion would result in the issuance of any fractional Common Share, the holder shall be entitled to the number of Common Shares determined by rounding the entitlement down to the nearest whole number.

(b) If the Company shall at any time or from time to time after the Original Issue Date effect a subdivision of the outstanding Common Shares, the Special Shares shall be similarly subdivided at the same time (failing which the Conversion Rate shall be adjusted accordingly). If the Company shall at any time or from time to time after the Original Issue Date effect a consolidation of the outstanding Common Shares, the Special Shares shall be similarly consolidated at the same time (failing which the Conversion Rate shall be adjusted accordingly). In each case, the dollar values set forth in Part 31 shall be appropriately adjusted to provide the holders of the Special Shares the same economic effect as contemplated by these Articles prior to such event.

(c) If the Common Shares of the Company shall be changed into the same or a different number of shares of any class, whether by capital reorganization, reclassification, or otherwise (other than a subdivision or combination of shares, or a reorganization, merger, amalgamation, arrangement, consolidation, business combination or sale of assets provided for below), then in the event that any Special Shares are thereafter converted into Common Shares, the holders of the Special Shares shall be entitled to receive the kind and amount of shares or other securities or property receivable, upon such reorganization, reclassification or other change, that would have otherwise been receivable by the holders of the number of Common Shares into which such Special Shares would have been converted immediately prior to such reorganization, reclassification or change, all subject to further adjustment as provided herein.

(d) In case of any merger, amalgamation, consolidation, arrangement, reorganization or other business combination involving the Company and any other corporation or other entity or Person (in each case, other than a Change of Control), then in the event that any Special Shares are thereafter converted into Common Shares, such Special Shares shall thereafter be convertible (or shall be converted into a security which shall be convertible) into the kind and amount of shares or other securities or property to which a holder of the number of Common Shares of the Company that would have otherwise been deliverable upon conversion of such Special Shares would have been entitled upon such event; and, in such case, appropriate adjustment (as determined in good faith by the board of directors of the Company) shall be made in the application of the provisions in this Article 30.6(d) set forth with respect to the rights and interest thereafter of the holders of the Special Shares, to the end that the provisions set forth in this Article 30.6(d) (including provisions with respect to changes in and other adjustments of the Conversion Rate) shall thereafter be applicable, as nearly as reasonably may be, in relation to any shares or other securities or property thereafter deliverable upon the conversion of the Special Shares.

(e) Upon any Special Shares being converted as herein provided, all rights with respect to such shares, including the rights, if any, to receive notices and to vote, shall immediately cease and terminate on the Automatic Conversion Date, other than the right of the holders thereof to receive Common Shares in exchange therefor.

PART 31
AUTOMATIC CONVERSIONS OF SPECIAL SHARES

31.1 Class A Special Shares Class A Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$15.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$15.00 per Common Share.

31.2 Class B Special Shares Class B Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$25.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$25.00 per Common Share.

31.3 Class C Special Shares Class C Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$35.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$35.00 per Common Share.

31.4 Class D Special Shares Class D Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$50.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$50.00 per Common Share.

31.5 Class E Special Shares Class E Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$75.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$75.00 per Common Share.

31.6 Class F Special Shares Class F Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$100.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$100.00 per Common Share.

31.7 Class G Special Shares Class G Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$150.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$150.00 per Common Share.

31.8 Class H Special Shares Class H Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$200.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$200.00 per Common Share.

31.9 Class I Special Shares Class I Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if:

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$50.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$50.00 per Common Share.

31.10 Class J Special Shares Class J Special Shares shall be converted automatically into Common Shares in accordance with the provisions set forth in this Part 31 if**:**

(a) on any twenty (20) Trading Days within any thirty (30) Trading Day period, the Common Shares trade on the principal securities exchange or securities market on which Common Shares are then traded for a price that is greater than or equal to US$12.00; or

(b) there occurs any transaction resulting in a Change of Control with a valuation of the Common Shares that is greater than or equal to US$12.00 per Common Share.

31.11 Automatic Conversion. Upon the occurrence of an Automatic Conversion under the foregoing Articles, all the then issued and outstanding Special Shares of the applicable class shall be converted automatically without any further action by the holders thereof and whether or not the certificates (if any) representing such shares are surrendered to the Company or its transfer agent; provided, however, that in each case all holders of Special Shares being converted shall be **given written notice of the** occurrence of an Automatic Conversion, including the date such event occurred (the "Automatic Conversion Date"), and the Company shall not be obligated to issue certificates evidencing the Common Shares issuable upon such conversion unless certificates evidencing such Special Shares being converted, if any, are either delivered to the Company, or its transfer agent, or the holder notifies the Company, or its transfer agent, that such certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Company to indemnify the Company (and its transfer agent, if applicable) from any loss incurred by it in connection therewith**.**

31.12 Effect of Automatic Conversion On the Automatic Conversion Date, all rights with respect to the Special Shares so converted shall terminate, except for any of the rights of the holder thereof, upon surrender of the holder's certificate or certificates therefor, to receive certificates for the number of Common Shares into which such Special Shares have been converted. Upon the automatic conversion of the applicable Special Shares, the holders of such Special Shares shall surrender the certificates representing such shares at the registered office of the Company or of its transfer agent. Upon surrender of such certificates, the Company shall promptly issue and deliver to such holder, in such holder's name as shown on such surrendered certificate or certificates, a certificate or certificates for the number of Common Shares into which the Special Shares surrendered were converted on the Automatic Conversion Date. Such conversion shall be deemed to have been made upon the occurrence of the Automatic Conversion and the Person or Persons entitled to receive the Common Shares issuable upon conversion shall be treated for all purposes as the record holder or holders of such Common Shares at such time**.**

PART 32
PREFERRED SHARES

32.1 Issuable in Series

(a) The Preferred Shares may include one or more series.

(b) Subject to Article 32.1(c) of these Articles and the *Business Corporations Act*, from time to time, the directors by resolution or the shareholders by ordinary resolution may, if none of the Preferred Shares of any particular series are issued, alter these Articles and authorize the alteration of the Notice of Articles of the Company, as the case may be, to do one or more of the following:

(i) determine the maximum number of shares of any of those series of Preferred Shares that the Company is authorized to issue, determine that there is no such maximum number, or alter any determination made under this Article 32.1(b)(i) or otherwise in relation to a maximum number of those shares;

(ii) create an identifying create an identifying name by which the shares of any of those series of Preferred Shares may be identified, or alter any identifying name created for those shares; and

(iii) attach or alter special rights or restrictions to the shares of any of those series of Preferred Shares, including, but without limiting or restricting the generality of the foregoing, special rights or restrictions with respect to:

(A) the rate, amount, method of calculation and payment of any dividends, whether cumulative, partly cumulative or non-cumulative, and whether such rate, amount, method of calculation or payment is subject to change or adjustment in the future;

(B) any rights upon a dissolution, liquidation or winding-up of the Company or upon any other return of capital or distribution of the assets of the Company among its shareholders for the purpose of winding up its affairs;

(C) any rights of redemption, retraction or purchase for cancellation and the prices and terms and conditions of any such rights;

(D) any rights of conversion, exchange or reclassification and the terms and conditions of any such rights;

(E) any rights to vote; and

(F) any other special rights or restrictions, not inconsistent with these share provisions, attaching to such series of Preferred Shares.

(c) No special rights or restrictions attached to any series of Preferred Shares shall confer upon the shares of such series a priority over the shares of any other series of Preferred Shares in respect of dividends or a return of capital in the event of the dissolution of the Company or on the occurrence of any other event that entitles the shareholders holding the shares of all series of the Preferred

Shares to a return of capital. The Preferred Shares of each series shall, with respect to the payment of dividends and the distribution of assets or return of capital in the event of dissolution or on the occurrence of any other event that entitles the shareholders holding the shares of all series of the Preferred Shares to a return of capital, rank on a parity with the shares of every other series.

Unless the special rights or restrictions attached to any series of Preferred Shares otherwise state, each series of Preferred Shares shall, with respect to the payment of dividends and the distribution of assets or return of capital in the event of dissolution or on the occurrence of any other event that entitles the shareholders holding the shares of all series of the Preferred Shares to a return of capital, rank in priority to the rights of holders of Common Shares and Special Shares and any other class of shares stated to be ranking junior to the Preferred Shares. For greater certainty, the amount of the priority in respect of the return of capital in the case of the distribution of assets or return of capital in the event of dissolution or on the occurrence of any other event that entitles the shareholders holding the shares of all series of the Preferred Shares to a return of capital shall be the amount stated or calculated in accordance with the special rights or restrictions of the particular series of Preferred Shares.

Dated _____, 2021.

FULL NAME AND SIGNATURE OF A DIRECTOR OF THE COMPANY

ANNEX D

TMC THE METALS COMPANY INC.

2021 INCENTIVE EQUITY PLAN

1. DEFINITIONS.

Unless otherwise specified or unless the context otherwise requires, the following terms, as used in this TMC the metals company Inc. 2021 Incentive Equity Plan, have the following meanings:

Active Employment means the period in which a Participant who is an Employee performs work for the Company or an Affiliate. For certainty, "Active Employment" shall be deemed to include only the period of minimum notice of termination as may be required to be provided to a Participant pursuant to applicable employment standards legislation but shall exclude any other period that follows the later of the end of the minimum statutory notice period or the Participant's last day of performing work for the Company or an Affiliate, including at common law.

Active Engagement means any period in which a Participant who is not an Employee provides services to the Company or an Affiliate. For certainty, "Active Engagement" shall exclude any period that follows, or ought to have followed, a Participant's last day of providing services to the Company or an Affiliate, including at common law.

Administrator means the Board of Directors, unless it has delegated power to act on its behalf to the Committee, in which case the term "Administrator" means the Committee.

Affiliate means a corporation or other entity, which, for purposes of Section 424 of the Code, is a parent or subsidiary of the Company, direct or indirect.

Agreement means a written or electronic document setting forth the terms of a Stock Right delivered pursuant to the Plan, in such form as the Administrator shall approve.

Board of Directors means the Board of Directors of the Company.

Cause means, with respect to a Participant: (a) "Cause" as defined in such Participant's written employment or service agreement with the Company or an Affiliate; or (b) if there is no such defined term, then: (i) dishonesty with respect to the Company or any Affiliate, (ii) gross negligence, serious misconduct or a material failure to discharge the duties relating to the employment or service with the Company or Affiliate, including insubordination, (iii) material breach by a Participant of any provision of any written employment, consulting, advisory, nondisclosure, non-competition or similar agreement between the Participant and the Company or any Affiliate or any material written policy of the Company or any Affiliate, or (iv) any act or omission which would constitute Cause at common law.

Closing means the date on which the transactions contemplated by the Business Combination Agreement among the Company, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, and DeepGreen Metals Inc., a company existing under the laws of British Columbia, dated March 4, 2021, are consummated.

Code means the United States Internal Revenue Code of 1986, as amended including any successor statute, regulation and guidance thereto.

Committee means the committee of the Board of Directors, if any, to which the Board of Directors has delegated power to act under or pursuant to the provisions of the Plan.

Common Shares means the Common Shares of the Company.

Company means TMC the metals company Inc. a company existing under the laws of British Columbia, Canada.

Consultant means any natural person who is an advisor or consultant who provides bona fide services to the Company or its Affiliates, provided that such services are not in connection with the offer or sale of securities in a capital raising transaction, and do not directly or indirectly promote or maintain a market for the Company's or its Affiliates' securities.

Corporate Transaction means a merger, consolidation, or sale of all or substantially all of the Company's assets or the acquisition of all of the outstanding voting stock of the Company (or similar transaction) in a single transaction or a series of related transactions by a single entity, other than a transaction to merely change the state of incorporation or in which the Company is the surviving corporation. Where a Corporate Transaction involves a tender offer that is reasonably expected to be followed by a merger (as determined by the Administrator), the Corporate Transaction will be deemed to have occurred upon consummation of the tender offer.

Date of Disability means: (a) the date on which a Participant's service is deemed terminated due to a Disability in accordance with a Participant's written employment or service agreement with the Company or an Affiliate or, (b) if there is no such defined term, on the last day of the relevant period as set out in the definition of Disability herein, subject to applicable human rights legislation.

Disability or Disabled has the meaning attributed thereto in a Participant's written employment or service agreement with the Company or an Affiliate or, if there is no such defined term, means the Participant's inability to substantially fulfil his or her duties on behalf of the Company or Affiliate as a result of illness or injury for a continuous period of nine (9) months or more or for an aggregate period of twelve (12) months or more during any consecutive twenty-four (24) month period.

Employee means any employee of the Company or of an Affiliate (including, without limitation, an employee who is also serving as an officer or director of the Company or of an Affiliate), designated by the Administrator to be eligible to be granted one or more Stock Rights under the Plan.

Exchange Act means the United States Securities Exchange Act of 1934, as amended.

Fair Market Value of a Common Share means:

(a) If the Common Shares are listed on a national securities exchange or traded in the over-the-counter market and sales prices are regularly reported for the Common Shares, the closing or, if not applicable, the last price of the Common Shares on the composite tape or other comparable reporting system for the trading day on the applicable date and if such applicable date is not a trading day, the last market trading day prior to such date;

(b) If the Common Shares are not traded on a national securities exchange but is traded on the over-the-counter market, if sales prices are not regularly reported for the Common Shares for the trading day referred to in clause (a), and if bid and asked prices for the Common Shares are regularly reported, the mean between the bid and the asked price for the Common Shares at the close of trading in the over-the-counter market for the most recent trading day on which Common Shares was traded on the applicable date and if such applicable date is not a trading day, the last market trading day prior to such date; and

(c) If the Common Shares are neither listed on a national securities exchange nor traded in the over-the-counter market, such value as the Administrator, in good faith, shall determine in compliance with applicable laws.

Option means an option to acquire Common Shares granted under the Plan.

Participant means an Employee, director or Consultant of the Company or an Affiliate to whom one or more Stock Rights are granted under the Plan. As used herein, "Participant" shall include "Participant's Survivors" where the context requires.

Performance-Based Award means a Stock Grant or Stock-Based Award which vests based on the attainment of written Performance Goals as set forth in Paragraph 9 hereof.

Performance Goals means performance goals determined by the Committee in its sole discretion and set forth in an Agreement. The satisfaction of Performance Goals shall be subject to certification by the Committee. The Committee has the authority to take appropriate action with respect to the Performance Goals (including, without limitation, making adjustments to the Performance Goals or determining the satisfaction of the Performance Goals in connection with a Corporate Transaction) provided that any such action does not otherwise violate the terms of the Plan.

Plan means this TMC the metals company Inc. 2021 Incentive Equity Plan.

SAR means a stock appreciation right.

Securities Act means the United States Securities Act of 1933, as amended.

Shares means Common Shares as to which Stock Rights have been or may be granted under the Plan or any shares of capital stock into which the Shares are changed or for which they are exchanged within the provisions of Paragraph 3 of the Plan. The Shares issued under the Plan may be authorized and unissued shares or shares held by the Company in its treasury, or both.

Stock-Based Award means a grant by the Company under the Plan of an equity award or an equity based award, which is not an Option, or a Stock Grant.

Stock Grant means a grant by the Company of Shares under the Plan.

Stock Right means an Option, a Stock Grant or a Stock-Based Award or a right to Shares or the value of Shares of the Company granted pursuant to the Plan.

Substitute Award means an award issued under the Plan in substitution for one or more equity awards of an acquired company that are converted, replaced or adjusted in connection with the acquisition.

Survivor means a deceased Participant's legal representatives and/or any person or persons who acquired the Participant's rights to a Stock Right by will or by the laws of descent and distribution.

Termination Date means, in respect of a Participant, such Participant's last day of Active Employment or Active Engagement (as applicable) with the Company or an Affiliate, whether such date is selected by the Participant, by mutual agreement between the Company or an Affiliate and the Participant, or unilaterally by the Company or an Affiliate.

2. PURPOSES OF THE PLAN.

The Plan is intended to encourage ownership of Shares by Employees and directors of and certain Consultants to the Company and its Affiliates in order to attract and retain such people, to induce them to work for the benefit of the Company or of an Affiliate and to provide additional incentive for them to promote the success of the Company or of an Affiliate. The Plan provides for the granting of Options, Stock Grants and Stock-Based Awards.

3. SHARES SUBJECT TO THE PLAN.

(a) The number of Shares that may be issued from time to time pursuant to this Plan shall be [__][1] Common Shares; provided that [__][2] of the outstanding Common Shares shall only be available for Stock Rights made to non-employee directors of the Company.

(b) Notwithstanding Subparagraph (a) above, on the first day of each fiscal year of the Company during the period beginning in fiscal year 2022 and ending on the tenth anniversary of the Closing, the number of Shares that may be issued from time to time pursuant to the Plan, shall be increased automatically by an amount equal to the lesser of (i) 4% of the number of outstanding Common Shares on such date and (ii) an amount determined by the Administrator (the "Annual Increase").

(c) If an Option ceases to be "outstanding", in whole or in part (other than by exercise), or if the Company shall reacquire (at not more than its original issuance price) any Shares issued pursuant to a Stock Grant or Stock-Based Award, or if any Stock Right expires or is forfeited, cancelled, or otherwise terminated or results in any Shares not being issued, the unissued or reacquired Shares which were subject to such Stock Right shall again be available for issuance from time to time pursuant to this Plan; provided, however, that the number of Shares underlying any awards under the Plan that are retained or repurchased on the exercise of an Option or the vesting or issuance of any Stock Right to cover the exercise price and/or tax withholding required by the Company in connection with vesting shall not be added back to the Shares available for issuance under the Plan. In addition, any Shares repurchased using exercise price proceeds will not be available for issuance under the Plan.

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[1] Note to Draft: To equal 11% of the number of outstanding shares of Common Stock at Closing, determined in accordance with the Business Combination Agreement immediately following the Closing.

[2] Note to Draft: To equal 1/11th of the initial share pool calculated pursuant to Footnote 1.

(e) The Administrator may grant Substitute Awards under the Plan. To the extent consistent with applicable legal requirements (including applicable stock exchange requirements), Shares issued in respect of Substitute Awards will be in addition to and will not reduce the shares available under the Plan. Notwithstanding the foregoing, if any Substitute Award is settled in cash or expires, becomes unexercisable, terminates or is forfeited to or repurchased by the Company without the issuance or retention of Shares, the Shares previously subject to such Award will not be available for future issuance under the Plan. The Administrator will determine the extent to which the terms and conditions of the Plan apply to Substitute Awards, if at all; provided, however, that Substitute Awards will not be subject to the limits described in Paragraph 4(c) below.

4. ADMINISTRATION OF THE PLAN.

The Administrator of the Plan will be the Board of Directors, except to the extent the Board of Directors delegates its authority to the Committee, in which case the Committee shall be the Administrator. Subject to the provisions of the Plan, the Administrator is authorized to:

(a) Interpret the provisions of the Plan and all Stock Rights and to make all rules and determinations which it deems necessary or advisable for the administration of the Plan;

(b) Determine which Employees, directors and Consultants shall be granted Stock Rights;

(c) Determine the number of Shares for which a Stock Right or Stock Rights shall be granted; provided, however, that in no event shall the aggregate grant date fair value (determined in accordance with ASC 718) of Stock Rights to be granted and any other cash compensation paid to any non-employee director in any calendar year, exceed US$500,000, increased US$750,000 in the year in which such non-employee director initially joins the Board of Directors.

(d) Specify the terms and conditions upon which a Stock Right or Stock Rights may be granted provided that no dividends or dividend equivalents shall be paid on any Stock Right prior to the vesting of the underlying Shares.

(e) Amend any term or condition of any outstanding Stock Right, provided that (i) such term or condition as amended is not prohibited by the Plan and (ii) any such amendment shall not impair the rights of a Participant under any Stock Right previously granted without such Participant’s consent or in the event of death of the Participant the Participant’s Survivors.

(f) Determine and make any adjustments in the Performance Goals included in any Performance-Based Awards; and

(g) Adopt any sub-plans applicable to residents of any specified jurisdiction as it deems necessary or appropriate in order to comply with or take advantage of any tax or other laws applicable to the Company, any Affiliate or to Participants or to otherwise facilitate the administration of the Plan, which sub-plans may include additional restrictions or conditions applicable to Stock Rights or Shares issuable pursuant to a Stock Right;

Subject to the foregoing, the interpretation and construction by the Administrator of any provisions of the Plan or of any Stock Right granted under it shall be final, unless otherwise determined by the Board of Directors, if the Administrator is the Committee. In addition, if the Administrator is the Committee, the Board of Directors may take any action under the Plan that would otherwise be the responsibility of the Committee.

To the extent permitted under applicable law, the Board of Directors or the Committee may allocate all or any portion of its responsibilities and powers to any one or more of its members and may delegate all or any portion of its responsibilities and powers to any other person selected by it. The Board of Directors or the Committee may revoke any such allocation or delegation at any time. Notwithstanding the foregoing, only the Board of Directors or the Committee shall be authorized to grant a Stock Right to any director of the Company or to any “officer” of the Company as defined by Rule 16a-1 under the Exchange Act.

5. ELIGIBILITY FOR PARTICIPATION.

The Administrator will, in its sole discretion, name the Participants in the Plan; provided, however, that each Participant must be an Employee, director or Consultant of the Company or of an Affiliate at the time a Stock Right is granted. Notwithstanding the foregoing, the Administrator may authorize the grant of a Stock Right to a person

in anticipation of such person becoming an Employee, director or Consultant of the Company or of an Affiliate, provided, that the actual grant of such Stock Right shall be conditioned upon such person becoming eligible to become a Participant at or prior to the time of the execution of the Agreement evidencing such Stock Right. Options, Stock Grants and Stock-Based Awards may be granted to any Employee, director or Consultant of the Company or an Affiliate. The granting of any Stock Right to any individual shall neither entitle that individual to, nor disqualify that individual from, participation in any other grant of Stock Rights or any grant under any other benefit plan established by the Company or any Affiliate for Employees, directors or Consultants.

6. TERMS AND CONDITIONS OF OPTIONS.

Each Option shall be set forth in an Option Agreement duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Administrator may provide that Options be granted subject to such terms and conditions, consistent with the terms and conditions specifically required under this Plan, as the Administrator may deem appropriate including, without limitation, subsequent approval by the shareholders of the Company of this Plan or any amendments thereto. In addition, the Option Agreements shall be subject to at least the following terms and conditions:

(a) Options: Each Option shall be subject to the terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company, subject to the following minimum standards for any such Option:

(i) Exercise Price: Each Option Agreement shall state the exercise price (per share) of the Shares covered by each Option which exercise price shall be determined by the Administrator and shall be at least equal to the Fair Market Value per Common Share on the date of grant of the Option, unless otherwise determined by the Administrator.

(ii) Number of Shares: Each Option Agreement shall state the number of Shares to which it pertains.

(iii) Vesting: Each Option Agreement shall state the date or dates on which it first is exercisable and the date after which it may no longer be exercised, and may provide that the Option rights accrue or become exercisable in installments over a period of months or years, or upon the occurrence of certain performance conditions or the attainment of stated goals or events.

(iv) Term of Option: Each Option shall terminate not more than ten years from the date of the grant or at such earlier time as the Option Agreement may provide.

(b) Except in connection with a corporate transaction involving the Company (which term includes, without limitation, any stock dividend, stock split, extraordinary cash dividend, recapitalization, reorganization, merger, consolidation, split-up, spin-off, combination or exchange of shares) or as otherwise contemplated by Paragraph 25 below, the Company may not, without obtaining stockholder approval, (i) amend the terms of outstanding Options to reduce the exercise price of such Options, (ii) cancel outstanding Options in exchange for Options that have an exercise price that is less than the exercise price value of the original Options, or (iii) cancel outstanding Options that have an exercise price greater than the Fair Market Value of a Share on the date of such cancellation in exchange for cash or other consideration.

7. TERMS AND CONDITIONS OF STOCK GRANTS.

Each Stock Grant to a Participant shall state the principal terms in an Agreement duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Agreement shall be in a form approved by the Administrator and shall contain terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company, subject to the following minimum standards:

(a) Each Agreement shall state the purchase price per Share, if any, of the Shares covered by each Stock Grant, which purchase price shall be determined by the Administrator on the date of the grant of the Stock Grant;

(b) Each Agreement shall state the number of Shares to which the Stock Grant pertains;

(c) Each Agreement shall include the terms of any right of the Company to restrict or reacquire the Shares subject to the Stock Grant, including the time period or attainment of Performance Goals or such other performance criteria upon which such rights shall accrue and the purchase price therefor, if any; and

(d) Dividends (other than stock dividends to be issued pursuant to Paragraph 25 of the Plan) may accrue but shall not be paid prior to the time, and may be paid only to the extent that, the restrictions or rights to reacquire the Shares subject to the Stock Grant lapse.

8. TERMS AND CONDITIONS OF OTHER STOCK-BASED AWARDS.

The Administrator shall have the right to grant other Stock-Based Awards based upon the Common Shares having such terms and conditions as the Administrator may determine, including, without limitation, the grant of Shares based upon certain conditions, the grant of securities convertible into Shares and the grant of SARs, phantom stock awards or stock units. The principal terms of each Stock-Based Award shall be set forth in an Agreement, duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Agreement shall be in a form approved by the Administrator and shall contain terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company. Each Agreement shall include the terms of any right of the Company including the right to terminate the Stock-Based Award without the issuance of Shares, the terms of any vesting conditions, Performance Goals or events upon which Shares shall be issued, provided that dividends (other than stock dividends to be issued pursuant to Paragraph 25 of the Plan) or dividend equivalents may accrue but shall not be paid prior to and may be paid only to the extent that the Shares subject to the Stock-Based Award vest. Under no circumstances may the Agreement covering SARs (a) have an exercise or base price (per share) that is less than the Fair Market Value per Common Share on the date of grant or (b) expire more than ten years following the date of grant.

9. PERFORMANCE-BASED AWARDS.

The Committee shall determine whether, with respect to a performance period, the applicable Performance Goals have been met with respect to a given Participant and, if they have, to so certify and ascertain the amount of the applicable Performance-Based Award. No Performance-Based Awards will be issued for such performance period until such certification is made by the Committee. The number of Shares issued in respect of a Performance-Based Award determined by the Committee for a performance period shall be paid to the Participant at such time as determined by the Committee in its sole discretion after the end of such performance period, and any dividends (other than stock dividends to be issued pursuant to Paragraph 25 of the Plan) or dividend equivalents that accrue shall only be paid in respect of the number of Shares earned in respect of such Performance-Based Award.

10. EXERCISE OF OPTIONS AND ISSUE OF SHARES.

An Option (or any part or installment thereof) shall be exercised by giving written notice to the Company or its designee (in a form acceptable to the Administrator, which may include electronic notice), together with provision for payment of the aggregate exercise price in accordance with this Paragraph for the Shares as to which the Option is being exercised, and upon compliance with any other condition(s) set forth in the Option Agreement. Such notice shall be signed by the person exercising the Option (which signature may be provided electronically in a form acceptable to the Administrator), shall state the number of Shares with respect to which the Option is being exercised and shall contain any representation required by the Plan or the Option Agreement. Payment of the exercise price for the Shares as to which such Option is being exercised shall be made (a) in United States dollars in cash or by check; or (b) at the discretion of the Administrator, through delivery of Common Shares held for at least six months (if required to avoid negative accounting treatment) having a Fair Market Value equal as of the date of the exercise to the aggregate cash exercise price for the number of Shares as to which the Option is being exercised; or (c) at the discretion of the Administrator, by having the Company retain from the Shares otherwise issuable upon exercise of the Option, a number of Shares having a Fair Market Value equal as of the date of exercise to the aggregate exercise price for the number of Shares as to which the Option is being exercised; (d) at the discretion of the Administrator, by permitting the Participant to surrender such number of Options in respect of Shares having a Fair Market Value that, when the aggregate exercise price of such Options is subtracted from such Fair Market Value, equals a difference as of the date of exercise to the aggregate exercise price for the number of Shares as to which the Option is being exercised; or (e) at the discretion of the Administrator, in accordance with a cashless exercise program established with a securities brokerage firm, and approved by the Administrator, providing for the sale of securities on the Participant’s behalf; or (f) at the discretion of the Administrator, by any combination of (a), (b), (c), (d) and (e) above or (g) at the discretion of the Administrator, by payment of such other lawful consideration as the Administrator may determine.

The Company shall then reasonably promptly deliver the Shares as to which such Option was exercised to the Participant (or to the Participant's Survivors, as the case may be). In determining what constitutes "reasonably promptly," it is expressly understood that the issuance and delivery of the Shares may be delayed by the Company if the Administrator determines it is necessary to comply with any law or regulation (including, without limitation, federal securities laws) that requires the Company to take any action with respect to the Shares prior to their issuance. The Shares shall, upon delivery, be fully paid, non-assessable Shares.

11. PAYMENT IN CONNECTION WITH THE ISSUANCE OF STOCK GRANTS AND STOCK-BASED AWARDS AND ISSUE OF SHARES.

Any Stock Grant or Stock-Based Award requiring payment of a purchase price for the Shares as to which such Stock Grant or Stock-Based Award is being granted shall be made (a) in United States dollars in cash or by check; or (b) at the discretion of the Administrator, through delivery of Common Shares held for at least six months (if required to avoid negative accounting treatment) and having a Fair Market Value equal as of the date of payment to the purchase price of the Stock Grant or Stock-Based Award; or (c) by delivery of a promissory note, if the Board of Directors has expressly authorized the loan of funds to the Participant for the purpose of enabling or assisting the Participant to effect such purchase; (d) at the discretion of the Administrator, by any combination of (a) through (c) above; or (e) at the discretion of the Administrator, by payment of such other lawful consideration as the Administrator may determine.

The Company shall when required by the applicable Agreement, reasonably promptly deliver the Shares as to which such Stock Grant or Stock-Based Award was made to the Participant (or to the Participant's Survivors, as the case may be), subject to any escrow provision set forth in the applicable Agreement. In determining what constitutes "reasonably promptly," it is expressly understood that the issuance and delivery of the Shares may be delayed by the Company if the Administrator determines it is necessary to comply with any law or regulation (including, without limitation, federal securities laws) which requires the Company to take any action with respect to the Shares prior to their issuance.

12. RIGHTS AS A SHAREHOLDER.

No Participant to whom a Stock Right has been granted shall have rights as a shareholder with respect to any Shares covered by such Stock Right except after due exercise of an Option or issuance of Shares as set forth in any Agreement, tender of the aggregate exercise or purchase price, if any, for the Shares being purchased and registration of the Shares in the Company's share register in the name of the Participant.

13. ASSIGNABILITY AND TRANSFERABILITY OF STOCK RIGHTS.

By its terms, a Stock Right granted to a Participant shall not be transferable by the Participant other than (i) by will or by the laws of descent and distribution, or (ii) as approved by the Administrator in its discretion and set forth in the applicable Agreement provided that no Stock Right may be transferred by a Participant for value. The designation of a beneficiary of a Stock Right by a Participant, with the prior approval of the Administrator and in such form as the Administrator shall prescribe, shall not be deemed a transfer prohibited by this Paragraph. Except as provided above during the Participant's lifetime a Stock Right shall only be exercisable by or issued to such Participant (or his or her legal representative) and shall not be assigned, pledged or hypothecated in any way (whether by operation of law or otherwise) and shall not be subject to execution, attachment or similar process. Any attempted transfer, assignment, pledge, hypothecation or other disposition of any Stock Right or of any rights granted thereunder contrary to the provisions of this Plan, or the levy of any attachment or similar process upon a Stock Right, shall be null and void.

14. EFFECT ON OPTIONS OF CESSATION OF SERVICE OTHER THAN FOR CAUSE OR DEATH OR DISABILITY.

Except as otherwise provided in a Participant's Option Agreement in the event of a cessation of service (whether as an Employee, director or Consultant) with the Company or an Affiliate before the Participant has exercised an Option, the following rules apply:

(a) A Participant who ceases to be an Employee, director or Consultant of the Company or of an Affiliate (for any reason other than for Cause, Disability, or death for which events there are special rules in Paragraphs 15, 16, and 17, respectively), may exercise any Option granted to such Participant to the extent that

the Option is exercisable on the Termination Date, but only within such term as the Administrator has designated in a Participant's Option Agreement. Except as otherwise determined by the Administrator, any Option, or portion thereof, that is not exercisable on the Termination Date will automatically terminate and become void on the Termination Date.

(b) The provisions of this Paragraph, and not the provisions of Paragraph 16 or 17, shall apply to a Participant who subsequently becomes Disabled or dies after their Termination Date; provided, however, in the case of a Participant's Disability or death within three months after the Termination Date, the Participant or the Participant's Survivors may exercise the Option within one year after the Termination Date, but in no event after the date of expiration of the term of the Option.

(c) Notwithstanding anything herein to the contrary, if subsequent to a Participant's Termination Date, but prior to the exercise of an Option, the Administrator determines that, prior to the Participant's Termination Date, the Participant engaged in conduct which would constitute Cause, then any Option which the Participant has not exercised at such time will automatically terminate and become void.

(d) A Participant to whom an Option has been granted under the Plan who is absent from the Company or an Affiliate because of temporary disability (any disability other than a Disability as defined in Paragraph 1 hereof), or who is on leave of absence for any purpose, shall not, during the period of any such absence, be deemed, by virtue of such absence alone, to have ceased to provide service (whether as an Employee, director or Consultant) to the Company or an Affiliate, except as the Administrator may otherwise expressly provide to the extent permitted by applicable legislation.

(e) Except as required by law or as set forth in a Participant's Option Agreement, Options granted under the Plan shall not be affected by any change of a Participant's status within or among the Company and any Affiliates, so long as the Participant continues to be an Employee, director or Consultant of the Company or any Affiliate.

15. EFFECT ON OPTIONS OF CESSATION OF SERVICE FOR CAUSE.

Except as otherwise provided in a Participant's Option Agreement, the following rules apply if the Participant's service (whether as an Employee, director or Consultant) with the Company or an Affiliate ceases for Cause prior to the time that all his or her outstanding Options have been exercised:

(a) All outstanding and unexercised Options as of the Termination Date will immediately terminate and become void.

(b) It is not necessary that the Administrator's finding of Cause occur prior to the Termination Date. If the Administrator determines, subsequent to a Participant's Termination Date but prior to the exercise of an Option, that prior to the Participant's Termination Date, the Participant engaged in conduct which would constitute Cause, then such Option will automatically terminate and become void.

16. EFFECT ON OPTIONS OF CESSATION OF SERVICE FOR DISABILITY.

Except as otherwise provided in a Participant's Option Agreement:

(a) A Participant who ceases to be an Employee, director or Consultant of the Company or of an Affiliate by reason of Disability may exercise any Option granted to such Participant to the extent that the Option has become exercisable but has not been exercised as of the Date of Disability; and in the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through to the Date of Disability of any additional vesting rights that would have accrued on the next vesting date had the Participant not become Disabled. The proration shall be based upon the number of days accrued in the current vesting period prior to Date of Disability.

(b) A Disabled Participant may exercise the Option only within the period ending one year after the Date of Disability, notwithstanding that the Participant might have been able to exercise the Option as to some or all of the Shares on a later date if the Participant had continued to be an Employee, director or Consultant or, if earlier, within the originally prescribed term of the Option.

17. EFFECT ON OPTIONS OF DEATH WHILE AN EMPLOYEE, DIRECTOR OR CONSULTANT.

Except as otherwise provided in a Participant's Option Agreement:

(a) In the event of the death of a Participant while the Participant is an Employee, director or Consultant of the Company or of an Affiliate, such Option may be exercised by the Participant's Survivors to the extent that the Option has become exercisable but has not been exercised on the date of death; and in the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of death of any additional vesting rights that would have accrued on the next vesting date had the Participant not died. The proration shall be based upon the number of days accrued in the current vesting period prior to the Participant's date of death.

(b) If the Participant's Survivors wish to exercise the Option, they must take all necessary steps to exercise the Option within one year after the date of death of such Participant, notwithstanding that the decedent might have been able to exercise the Option as to some or all of the Shares on a later date if he or she had not died and had continued to be an Employee, director or Consultant or, if earlier, within the originally prescribed term of the Option.

18. EFFECT OF CESSATION OF SERVICE ON UNACCEPTED STOCK GRANTS AND STOCK-BASED AWARDS.

In the event of a cessation of service (whether as an Employee, director or Consultant) with the Company or an Affiliate for any reason before the Participant has accepted a Stock Grant or a Stock-Based Award and paid the purchase price, if required, such grant will automatically terminate on the Termination Date, Date of Disability or date of death, as applicable.

For purposes of this Paragraph 18 and Paragraph 19 below, a Participant to whom a Stock Grant or a Stock-Based Award has been issued under the Plan who is absent from work with the Company or with an Affiliate because of temporary disability (any disability other than a Disability as defined in Paragraph 1 hereof), or who is on leave of absence for any purpose, shall not, during the period of any such absence, be deemed, by virtue of such absence alone, to have ceased to provide service (whether as an Employee, director or Consultant) to the Company or an Affiliate, except as the Administrator may otherwise expressly provide to the extent permitted by applicable legislation.

In addition, for purposes of this Paragraph 18 and Paragraph 19 below, any change of employment or other service within or among the Company and any Affiliates shall not be treated as a cessation of service (whether as an Employee, director or Consultant) so long as the Participant continues to be an Employee, director or Consultant of the Company or any Affiliate.

19. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF CESSATION OF SERVICE OTHER THAN FOR CAUSE, DEATH OR DISABILITY.

Except as otherwise provided in a Participant's Agreement, in the event of a cessation of service for any reason (whether as an Employee, director or Consultant), other than for Cause, death or Disability for which there are special rules in Paragraphs 20, 21, and 22 below, before all forfeiture provisions or Company rights of repurchase shall have lapsed, then as of the Termination Date the Company shall have the right to cancel or repurchase that number of Shares subject to a Stock Grant or Stock-Based Award as to which the Company's forfeiture or repurchase rights have not lapsed.

20. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF CESSATION OF SERVICE FOR CAUSE.

Except as otherwise provided in a Participant's Agreement, the following rules apply if the Participant's service (whether as an Employee, director or Consultant) with the Company or an Affiliate ceases for Cause:

(a) All Shares subject to any Stock Grant or Stock-Based Award that remain subject to forfeiture provisions or as to which the Company shall have a repurchase right shall be immediately forfeited to the Company as of the Termination Date.

(b) It is not necessary that the Administrator's finding of Cause occur prior to the Termination Date. If the Administrator determines, subsequent to a Participant's Termination Date, that prior to the Participant's Termination Date, the Participant engaged in conduct which would constitute Cause, then all Shares subject to any Stock Grant or Stock-Based Award that remained subject to forfeiture provisions or as to which the Company had a repurchase right on the Termination Date shall be immediately forfeited to the Company.

21. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF CESSATION OF SERVICE FOR DISABILITY.

Except as otherwise provided in a Participant's Agreement, the following rules apply if a Participant ceases to be an Employee, director or Consultant of the Company or of an Affiliate by reason of Disability: to the extent the forfeiture provisions or the Company's rights of repurchase have not lapsed on the Date of Disability, they shall be exercisable; provided, however, that in the event such forfeiture provisions or rights of repurchase lapse periodically, such provisions or rights shall lapse to the extent of a pro rata portion of the Shares subject to such Stock Grant or Stock-Based Award through to the Date of Disability as would have lapsed had the Participant not become Disabled. The proration shall be based upon the number of days accrued prior to the Date of Disability.

22. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF DEATH WHILE AN EMPLOYEE, DIRECTOR OR CONSULTANT.

Except as otherwise provided in a Participant's Agreement, the following rules apply in the event of the death of a Participant while the Participant is an Employee, director or Consultant of the Company or of an Affiliate: to the extent the forfeiture provisions or the Company's rights of repurchase have not lapsed on the date of death, they shall be exercisable; provided, however, that in the event such forfeiture provisions or rights of repurchase lapse periodically, such provisions or rights shall lapse to the extent of a pro rata portion of the Shares subject to such Stock Grant or Stock-Based Award through the date of death as would have lapsed had the Participant not died. The proration shall be based upon the number of days accrued prior to the Participant's date of death.

At the discretion of the Administrator, the Company shall have received an opinion of its counsel that the Shares may be issued in compliance with the Securities Act without registration thereunder.

23. NO RIGHTS TO STOCK RIGHTS OR DAMAGES

No Participant shall have any claim to be granted any Stock Right under the Plan, and there is no obligation for uniformity of treatment of Participants. The granting of any Stock Right hereunder shall not impose any obligation on the Company to grant any Stock Right to any Participant in the future nor shall it entitle any Participant to receive any further Stock Right. No Participant shall have any entitlement to damages or other compensation whatsoever arising from or related to not receiving any Stock Right under the Plan, including with respect to any Stock Right which may have vested or been granted after the Participant's Termination Date, including but not limited to damages in lieu of notice at common law.

24. DISSOLUTION OR LIQUIDATION OF THE COMPANY.

Upon the dissolution or liquidation of the Company, all Options granted under this Plan which as of such date shall not have been exercised and all Stock Grants and Stock-Based Awards which have not been accepted, to the extent required under the applicable Agreement, will terminate and become null and void; provided, however, that if the rights of a Participant or a Participant's Survivors have not otherwise terminated and expired, the Participant or the Participant's Survivors will have the right immediately prior to such dissolution or liquidation to exercise or accept any Stock Right to the extent that the Stock Right is exercisable or subject to acceptance as of the date immediately prior to such dissolution or liquidation. Upon the dissolution or liquidation of the Company, any outstanding Stock-Based Awards shall immediately terminate unless otherwise determined by the Administrator or specifically provided in the applicable Agreement.

25. ADJUSTMENTS.

Upon the occurrence of any of the following events, a Participant's rights with respect to any Stock Right granted to such Participant hereunder shall be adjusted as hereinafter provided, unless otherwise specifically provided in a Participant's Agreement.

(a) Changes with respect to Common Shares.

(i) If (1) the Common Shares shall be subdivided or combined into a greater or smaller number of shares or if the Company shall issue any Common Shares as a stock dividend on its outstanding Common Shares, or (2) additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such Common Shares, each Stock Right and the number of Common Shares deliverable thereunder shall be appropriately increased or decreased proportionately, and appropriate adjustments shall be made including, in the exercise, base or purchase price per share and in the Performance Goals applicable to outstanding Performance-Based Awards to reflect such events. The number of Shares subject to the limitations in Paragraphs 3(a), 3(b), 3(d) and 4(c) shall also be proportionately adjusted upon the occurrence of such events.

(ii) The Administrator may also make adjustments of the type described in Paragraph 25(a) above to take into account distributions to stockholders other than those provided for in Paragraphs 25(b) below, or any other event, if the Administrator determines that adjustments are appropriate to avoid distortion in the operation of the Plan or any Award.

(ii) References in the Plan to Shares will be construed to include any stock or securities resulting from an adjustment pursuant to this Paragraph 25(a).

(b) Corporate Transactions. If the Company is to be consolidated with or acquired by another entity in a Corporate Transaction, the Administrator or the board of directors of any entity assuming the obligations of the Company hereunder (the "Successor Board"), may, as to outstanding Options, take any of the following actions: (i) make appropriate provision for the continuation of such Options by substituting on an equitable basis for the Shares then subject to such Options either the consideration payable with respect to the outstanding Common Shares in connection with the Corporate Transaction or securities of any successor or acquiring entity; or (ii) upon written notice to the Participants, provide that such Options must be exercised (either (A) to the extent then exercisable or (B) at the discretion of the Administrator, any such Options being made partially or fully exercisable for purposes of this Subparagraph), within a specified number of days of the date of such notice, at the end of which period such Options which have not been exercised shall terminate; or (iii) terminate such Options in exchange for payment of an amount equal to the consideration payable upon consummation of such Corporate Transaction to a holder of the number of shares of Common Shares into which such Option would have been exercisable (either (A) to the extent then exercisable or, (B) at the discretion of the Administrator, any such Options being made partially or fully exercisable for purposes of this Subparagraph) less the aggregate exercise price thereof. For purposes of determining the payments to be made pursuant to Subclause (iii) above, in the case of a Corporate Transaction the consideration for which, in whole or in part, is other than cash, the consideration other than cash shall be valued at the fair value thereof as determined in good faith by the Board of Directors. For the avoidance of doubt, if the per share exercise price of an Option or portion thereof is equal to or greater than the Fair Market Value of one Share of Common Shares, such Option may be cancelled with no payment due hereunder or otherwise in respect thereof.

With respect to outstanding Stock Grants or Stock-Based Awards, the Administrator or the Successor Board, shall make appropriate provision for the continuation of such Stock Grants or Stock-Based Awards on the same terms and conditions by substituting on an equitable basis for the Shares then subject to such Stock Grants or Stock-Based Awards either the consideration payable with respect to the outstanding Shares of Common Shares in connection with the Corporate Transaction or securities of any successor or acquiring entity. In lieu of the foregoing, in connection with any Corporate Transaction, the Administrator may provide that each outstanding Stock Grant or Stock-Based Award shall be terminated in exchange for payment of an amount equal to the consideration payable upon consummation of such Corporate Transaction to a holder of the number of shares of Common Shares comprising such Stock Grant or Stock-Based Award (to the extent such Stock Grant or Stock-Based Award is no longer subject to any forfeiture or repurchase rights then in effect or, at the discretion of the Administrator, all forfeiture and repurchase rights being waived). For the avoidance of doubt, if the purchase or base price of a Stock Grant or Stock-Based Award or portion thereof is equal to or greater than the Fair Market Value of one Share, such Stock Grant or Stock-Based Award, as applicable, may be cancelled with no payment due hereunder or otherwise in respect thereof.

In taking any of the actions permitted under this Paragraph 25(b), the Administrator shall not be obligated by the Plan to treat all Stock Rights, all Stock Rights held by a Participant, or all Stock Rights of the same type, identically.

(c) Recapitalization or Reorganization. In the event of a recapitalization or reorganization of the Company other than a Corporate Transaction pursuant to which securities of the Company or of another corporation are issued with respect to the outstanding Common Shares, a Participant upon exercising an Option or accepting a Stock Grant after the recapitalization or reorganization shall be entitled to receive for the price paid upon such exercise or acceptance if any, the number of replacement securities which would have been received if such Option had been exercised or Stock Grant accepted prior to such recapitalization or reorganization.

(d) Adjustments to Stock-Based Awards. Upon the happening of any of the events described in Subparagraphs (a), (b) or (c) above, any outstanding Stock-Based Award shall be appropriately adjusted to reflect the events described in such Subparagraphs. The Administrator or the Successor Board shall determine the specific adjustments to be made under this Paragraph 25, including, but not limited to the effect of any, Corporate Transaction and, subject to Paragraph 4, its determination shall be conclusive.

(e) Termination of Awards upon Consummation of a Corporate Transaction. Except as the Administrator may otherwise determine, each Stock Right will automatically terminate (and in the case of outstanding Shares of restricted Common Shares, will automatically be forfeited) immediately upon the consummation of a Corporate Transaction, other than (i) any award that is assumed, continued or substituted pursuant to Paragraph 25(b) above, and (ii) any cash award that by its terms, or as a result of action taken by the Administrator, continues following the consummation of the Corporate Transaction.

26. ISSUANCES OF SECURITIES.

(a) Except as expressly provided herein, no issuance by the Company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect, and no adjustment by reason thereof shall be made with respect to, the number or price of shares subject to Stock Rights. Except as expressly provided herein, no adjustments shall be made for dividends paid in cash or in property (including without limitation, securities) of the Company prior to any issuance of Shares pursuant to a Stock Right.

(b) The Company will not be obligated to issue any Shares pursuant to the Plan or to remove any restriction from Shares previously issued under the Plan until: (i) the Company is satisfied that all legal matters in connection with the issuance of such Shares have been addressed and resolved; (ii) if the outstanding Shares is at the time of issuance listed on any stock exchange or national market system, the Shares to be issued have been listed or authorized to be listed on such exchange or system upon official notice of issuance; and (iii) all conditions of the award have been satisfied or waived. The Company may require, as a condition to the exercise of an award or the issuance of Shares under an award, such representations or agreements as counsel for the Company may consider appropriate to avoid violation of the Securities Act of 1933, as amended, or any applicable state or non-U.S. securities law. Any Shares issued under the Plan will be evidenced in such manner as the Administrator determines appropriate, including book-entry registration or delivery of stock certificates. In the event that the Administrator determines that stock certificates will be issued in connection with Shares issued under the Plan, the Administrator may require that such certificates bear an appropriate legend reflecting any restriction on transfer applicable to such Stock, and the Company may hold the certificates pending the lapse of the applicable restrictions.

27. FRACTIONAL SHARES.

No fractional shares shall be issued under the Plan. The person exercising a Stock Right shall receive from the Company cash in lieu of such fractional shares equal to the Fair Market Value thereof, provided that, notwithstanding the foregoing, in the case of any Stock Right subject to section 7 of the *Income Tax Act* (Canada), the fractional shares subject to such Stock Right shall be rounded down to the nearest whole number of Shares with no further consideration payable to the Participant.

28. WITHHOLDING.

In the event that any federal, state, provincial or local income taxes, employment taxes, Federal Insurance Contributions Act withholdings or other amounts are required by applicable law or governmental regulation to be withheld in connection with the issuance of a Stock Right or Shares under the Plan, the Company or an Affiliate may withhold the amount necessary to satisfy such obligations from any amount which would otherwise be delivered, provided or paid to the Participant by the Company or an Affiliate, whether under this Plan or otherwise, or may require that the Participant advance in cash to the Company, or to any Affiliate of the Company which employs or employed the Participant, the statutory minimum amount of such withholdings unless a different withholding

arrangement, including the use of shares of the Company's Common Shares or a promissory note, is authorized by the Administrator (and permitted by law). For purposes hereof, the fair market value of the shares withheld for purposes of payroll withholding shall be determined in the manner set forth under the definition of Fair Market Value provided in Paragraph 1 above, as of the most recent practicable date. If the Fair Market Value of the shares withheld is less than the amount of payroll withholdings required, the Participant may be required to advance the difference in cash to the Company or the Affiliate employer.

29. TERMINATION OF THE PLAN.

The Plan will terminate on the date which is ten years from the earlier of the date of its adoption by the Board of Directors and the date of its approval by the shareholders of the Company. The Plan may be terminated at an earlier date by vote of the shareholders or the Board of Directors of the Company; provided, however, that any such earlier termination shall not affect any Agreements executed prior to the effective date of such termination. Termination of the Plan shall not affect any Stock Rights theretofore granted.

30. AMENDMENT OF THE PLAN AND AGREEMENTS.

The Plan may be amended by the shareholders of the Company. The Plan may also be amended by the Administrator; provided that any amendment approved by the Administrator which the Administrator determines is of a scope that requires shareholder approval shall be subject to obtaining such shareholder approval including, without limitation, to the extent necessary to qualify any or all outstanding Stock Rights granted under the Plan or Stock Rights to be granted under the Plan for favorable federal income tax treatment as may be afforded ISOs under Section 422 and to the extent necessary to qualify the Shares issuable under the Plan for listing on any national securities exchange or quotation in any national automated quotation system of securities dealers. Any modification or amendment of the Plan shall not, without the consent of a Participant, adversely affect his or her rights under a Stock Right previously granted to such Participant, unless such amendment is required by applicable law or necessary to preserve the economic value of such Stock Right. With the consent of the Participant affected, the Administrator may amend outstanding Agreements in a manner which may be adverse to the Participant but which is not inconsistent with the Plan. In the discretion of the Administrator, outstanding Agreements may be amended by the Administrator in a manner which is not adverse to the Participant. Nothing in this Paragraph 30 shall limit the Administrator's authority to take any action permitted pursuant to Paragraph 25.

31. EMPLOYMENT OR OTHER RELATIONSHIP.

Nothing in this Plan or any Agreement shall be deemed to prevent the Company or an Affiliate from terminating the employment, consultancy or director status of a Participant, nor to prevent a Participant from terminating his or her own employment, consultancy or director status or to give any Participant a right to be retained in employment or other service by the Company or any Affiliate for any period of time.

32. INDEMNITY.

Neither the Board of Directors nor the Administrator, nor any members of either, nor any employees of the Company or any parent, subsidiary, or other Affiliate, shall be liable for any act, omission, interpretation, construction or determination made in good faith in connection with their responsibilities with respect to this Plan, and the Company hereby agrees to indemnify the members of the Board or Directors, the members of the Committee, and the employees of the Company and its parent or subsidiaries in respect of any claim, loss, damage, or expense (including reasonable counsel fees) arising from any such act, omission, interpretation, construction or determination to the full extent permitted by law.

33. CLAWBACK.

Notwithstanding anything to the contrary contained in this Plan, the Company may recover from a Participant any compensation received from any Stock Right (whether or not settled) or cause a Participant to forfeit any Stock Right (whether or not vested) in the event that the Company's Clawback Policy as then in effect is triggered.

34. WAIVER OF JURY TRIAL.

By accepting or being deemed to have accepted an award under the Plan, each Participant waives (or will be deemed to have waived), to the maximum extent permitted under applicable law, any right to a trial by jury in any action, proceeding or counterclaim concerning any rights under the Plan or any award, or under any amendment,

waiver, consent, instrument, document or other agreement delivered or which in the future may be delivered in connection therewith, and agrees (or will be deemed to have agreed) that any such action, proceedings or counterclaim will be tried before a court and not before a jury. By accepting or being deemed to have accepted an award under the Plan, each Participant certifies that no officer, representative, or attorney of the Company has represented, expressly or otherwise, that the Company would not, in the event of any action, proceeding or counterclaim, seek to enforce the foregoing waivers. Notwithstanding anything to the contrary in the Plan, nothing herein is to be construed as limiting the ability of the Company and a Participant to agree to submit any dispute arising under the terms of the Plan or any ward to binding arbitration or as limiting the ability of the Company to require any individual to agree to submit such disputes to binding arbitration as a condition of receiving an award hereunder.

35. UNFUNDED OBLIGATIONS.

The Company's obligations under the Plan are unfunded, and no Participant will have any right to specific assets of the Company in respect of any award under the Plan. Participants will be general unsecured creditors of the Company with respect to any amounts due or payable under the Plan.

36. GOVERNING LAW.

This Plan shall be construed and enforced in accordance with the laws of the Province of British Columbia and the laws of Canada applicable therein.

Addendum
Terms of Grant of Options to United States Employees

U.S. SUB-PLAN TO THE
TMC THE METALS COMPANY INC.

2021 INCENTIVE EQUITY PLAN

The Board of Directors of TMC the metals company Inc. (the "Company") established the TMC the metals company Inc. 2021 Incentive Equity Plan (the "Plan"). Through the Plan, the Company established a framework to aid the Company in attracting and retaining the best available individuals for positions of substantial responsibility, and to promote the success of the Company's and its Affiliates' business by aligning the financial interests of individuals providing services to the Company and the Affiliates with long-term shareholder value.

The Board determined that it was necessary and desirable to establish a sub-plan of the Plan for the purpose of granting Options to Employees who are residents of the United States or who are or may become subject to U.S. tax (i.e., income tax, social security and/or withholding tax ("U.S. Participant")), with such Options qualifying as either Non-Qualified Stock Options or Incentive Stock Options (within the meaning of Section 422 of the Code), to cause all Options under the Plan to be exempt from or comply with Section 409A of the Code, and to cause Options to comply with certain other provisions and exemptions under U.S. law. The terms of the Plan, as amended from time to time, shall, subject to the provisions hereof, constitute this U.S. Sub-Plan of the Plan (this "U.S. Sub-Plan"). This U.S. Sub-Plan supplements, and shall be read in conjunction with the Plan, and is subject to the terms and conditions of the Plan; provided, that to the extent that the terms and conditions of the Plan differ from or conflict with the terms or conditions of this U.S. Sub-Plan, the terms and conditions of this U.S. Sub-Plan shall prevail.

1. DEFINITIONS

For the purposes of this U.S. Sub-Plan, the definitions set out in the Plan shall apply to this U.S. Sub-Plan as such definitions apply to the Plan and in addition the following terms shall have the following meanings (unless the context requires otherwise):

Disability or Disabled means a permanent and total disability as defined in Section 22(e)(3) of the Code.

ISO means an Option intended to qualify as an "incentive stock option" under Section 422.

Non-Qualified Option means an Option which is not intended to qualify as an ISO.

Section 409A means Section 409A of the Code.

Section 422 means Section 422 of the Code.

SHARES SUBJECT TO THE PLAN

All of the Shares available for grant as set forth in Paragraph 3 under the Plan may be issues as ISOs. The limits set forth in Paragraph 3 of the Plan will be construed to comply with the applicable requirements of Section 422. For purposes of determining the number of Shares available for grant under the Plan as ISOs under Paragraph 3(c) of the Plan, such provisions shall be subject to any limitations under the Code. In addition, Shares issued in respect of Substitute Awards that are ISOs shall be consistent with Section 422.

ELIGIBILITY

ISOs may be granted only to Employees.

TERMS AND CONDITIONS OF OPTIONS TO U.S. PARTICIPANTS

Each Option intended to be a Non-Qualified Option shall meet the minimum standards required of Options, as described in Paragraph 6(a) of the Plan, except that the exercise price per share of the Shares covered by each ISO shall not be less than 100% of the Fair Market Value per share of the Common Shares on the date of grant of the Option so as to be exempt from the requirements of Section 409A. If the Administrator determines to grant an Option at less than 100% of the Fair Market Value per Common Share, the Option must comply with the requirements of Section 409A or be exempt from the requirements of Section 409A pursuant Treas. Reg. Section 1.409-1(b)(4).

Each Option intended to be an ISO shall be issued only to an Employee who is deemed to be a resident of the United States for tax purposes, and shall be subject to the following terms and conditions, with such additional restrictions or changes as the Administrator determines are appropriate but not in conflict with Section 422 and relevant regulations and rulings of the Internal Revenue Service:

(i) Minimum Standards: The ISO shall meet the minimum standards required of Options, as described in Paragraph 6(a) of the Plan, except clause (i) and (iv) thereunder.

(ii) Exercise Price: Immediately before the ISO is granted, if the U.S. Participant owns, directly or by reason of the applicable attribution rules in Section 424(d) of the Code:

A. 10% or less of the total combined voting power of all classes of stock of the Company or an Affiliate, the exercise price per share of the Shares covered by each ISO shall not be less than 100% of the Fair Market Value per share of the Common Shares on the date of grant of the Option; or

B. More than 10% of the total combined voting power of all classes of stock of the Company or an Affiliate, the exercise price per share of the Shares covered by each ISO shall not be less than 110% of the Fair Market Value per share of the Common Shares on the date of grant of the Option.

(iii) Term of Option: For U.S. Participants who own:

A. 10% or less of the total combined voting power of all classes of stock of the Company or an Affiliate, each ISO shall terminate not more than ten years from the date of the grant or at such earlier time as the Option Agreement may provide; or

B. More than 10% of the total combined voting power of all classes of stock of the Company or an Affiliate, each ISO shall terminate not more than five years from the date of the grant or at such earlier time as the Option Agreement may provide.

(iv) Limitation on Yearly Exercise: To the extent that aggregate Fair Market Value (determined on the date each ISO is granted) of the Shares with respect to which ISOs are exercisable for the first time by the U.S. Participant in any calendar year exceeds US$100,000, such Options shall be treated as Non-Qualified Options even if denominated ISOs at grant.

DIVIDENDS

With respect to Stock Grants, any entitlement to dividend equivalents or similar entitlements will be established and administered either consistent with an exemption from, or in compliance with the applicable requirements of Section 409A.

EXERCISE OF OPTIONS - PAYMENT

The Administrator shall accept only such payment on exercise of an ISO as is permitted by Section 422.

TRANSFER

An ISO transferred except in compliance with clause (i) of Paragraph 13 shall no longer qualify as an ISO.

TERMINATION OF SERVICE; LEAVE OF ABSENCE

Except as provided in Subparagraph (b) of Paragraph 14 of the Plan, or Paragraph 16 or 17 of the Plan, in no event may an ISO be exercised later than three months after the U.S. Participant’s termination of employment. If the U.S. Participant does not exercise the ISO within three months after termination, to the extent is not yet terminated, it shall automatically convert to a Non-Qualified Option.

With respect to ISOs, any leave of absence granted by the Administrator of greater than three months, unless pursuant to a contract or statute that guarantees the right to reemployment, shall cause such ISO to become a Non-Qualified Option on the date that is six months following the commencement of such leave of absence.

ADJUSTMENTS

Any adjustments under Paragraph 25 of the Plan shall have due regard for the qualification of ISOs under Section 422, the requirements of Section 409A, to the extent applicable

SECTION 409A AND SECTION 422

The Company intends that the Plan and any Awards granted to U.S Participants be exempt from or comply with Section 409A, to the extent applicable. The Company intends that ISOs comply with Section 422, to the extent applicable. Any ambiguities in the Plan or any Award shall be construed to effect the intent as described herein.

If a U.S Participant is a “specified employee” as defined in Section 409A (and as applied according to procedures of the Company and its Affiliates) as of his or her separation from service, to the extent any payment under this Plan or pursuant to an Award constitutes non-exempt deferred compensation under Section 409A that is being paid by reason of separation from service, no payments due under this Plan or pursuant to an Award may be made until the earlier of: (i) the first day of the seventh month following the U.S. Participant’s separation from service, or (ii) the U.S. Participant’s date of death; provided, however, that any payments delayed during this six-month period shall be paid in the aggregate in a lump sum, without interest, on the first day of the seventh month following the U.S. Participant’s separation from service.

The Administrator shall administer the Plan with respect to Stock Awards to U.S. Participants with a view toward ensuring that Awards under the Plan that are subject to Section 409A or Section 422, as applicable, comply with the requirements thereof and that Options under the Plan be exempt from the requirements of Section 409A or compliant with Section 422, as applicable, but neither the Administrator nor any member of the Board of Directors, nor the Company nor any of its Affiliates, nor any other person acting hereunder on behalf of the Company, the Administrator or the Board of Directors shall be liable to a U.S. Participant or any Survivor by reason of the acceleration of any income, or the imposition of any additional tax or penalty, with respect to any Award, whether by reason of a failure to satisfy the requirements of Section 409A or Section 422 or otherwise.

GOVERNING LAW

This U.S. Sub Plan shall be construed and enforced in accordance with the laws of the State of Delaware.

ANNEX E-1

FORM OF SUBSCRIPTION AGREEMENT

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Ladies and Gentlemen:

This Subscription Agreement (this "Subscription Agreement") is being entered into as of the date set forth on the signature page hereto, by and between Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company, which shall migrate and be continued from the Cayman Islands to British Columbia, Canada and continued as a company in British Columbia prior to the closing of the Transaction (as defined herein) ("SOAC"), and the undersigned subscriber (the "Investor"), in connection with the Business Combination Agreement, dated as of the date hereof (as may be amended, supplemented or otherwise modified from time to time, the "Transaction Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada, and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada (the "Company"), and the other parties thereto, pursuant to which, among other things, SOAC will acquire all of the issued and outstanding shares in the capital of the Company in exchange for common shares of SOAC, and the Company will become a wholly-owned subsidiary of SOAC, upon and subject to the plan of arrangement and other terms and conditions set forth in the Transaction Agreement (the "Transaction").

In connection with the Transaction, SOAC is seeking commitments from interested investors to purchase, contingent upon, and substantially concurrently with the closing of the Transaction, SOAC's common shares (the "Shares"), in a private placement for a purchase price of $10.00 per Share (the "Per Share Purchase Price"). On or about the date of this Subscription Agreement, SOAC is entering into subscription agreements (the "Other Subscription Agreements," and together with this Subscription Agreement, the "Subscription Agreements") with certain other investors (the "Other Investors," and together with the Investor, severally and not jointly, the "Investors"), pursuant to which the Investors have agreed to purchase on the closing date of the Transaction, inclusive of the Shares subscribed for by the Investor under this Subscription Agreement, an aggregate amount of up to 33,030,000 Shares, at the Per Share Purchase Price.

The aggregate purchase price to be paid by the Investor for the subscribed Shares (as set forth on the signature page hereto) is referred to herein as the "Subscription Amount."

In connection therewith, and in consideration of the foregoing and the mutual representations, warranties and covenants, and subject to the conditions, set forth herein, and intending to be legally bound hereby, each of the Investor and SOAC acknowledges and agrees as follows:

1. Subscription. The Investor hereby irrevocably subscribes for and agrees to purchase from SOAC, and SOAC agrees to issue and sell to the Investor, the number of Shares set forth on the signature page of this Subscription Agreement on the terms and subject to the conditions provided for herein. The Investor acknowledges and agrees that SOAC reserves the right to accept or reject the Investor's subscription for the Shares for any reason or for no reason, in whole or in part, at any time prior to its acceptance, and the same shall be deemed to be accepted by SOAC only when this Subscription Agreement is signed by a duly authorized person by or on behalf of SOAC; SOAC may do so in counterpart form.

2. Closing. The closing of the sale of the Shares contemplated hereby (the "Closing") is contingent upon the substantially concurrent consummation of the Transaction. The Closing shall occur on the date of, and substantially concurrently with and conditioned upon the effectiveness of, the Transaction. Upon (a) satisfaction or waiver of the conditions set forth in Section 4 below and (b) delivery of written notice from (or on behalf of) SOAC to the Investor (the "Closing Notice") that SOAC reasonably expects all conditions to the closing of the Transaction to be satisfied or waived on a date that is not less than five (5) business days from the date on which the Closing Notice is delivered to the Investor, the Investor shall deliver to SOAC, one (1) business day prior to the closing date specified in the Closing Notice (the "Closing Date"), (i) the Subscription Amount by wire transfer of United States dollars in immediately available funds to the account(s) specified by SOAC in the Closing Notice and (ii) any other information that is reasonably requested in the Closing Notice in order for SOAC to issue the Investor's Shares, including, without limitation, the legal name of the person in whose name such Shares are to be issued and a duly

executed Internal Revenue Service Form W-9 or W-8, as applicable. On the Closing Date, SOAC shall issue a number of Shares to the Investor set forth on the signature page to this Subscription Agreement and subsequently cause such Shares to be registered in book entry form, free and clear of any liens or other restrictions whatsoever (other than those arising under state, provincial or federal securities laws or under the organizational documents of SOAC) in the name of the Investor (or its nominee in accordance with the Investor's instructions) or to a custodian designated by the Investor, as applicable, on SOAC's share register; provided, however, that SOAC's obligation to issue the Shares to the Investor is contingent upon SOAC having received the Subscription Amount in full accordance with this Section 2. If the Closing does not occur within five (5) business days following the Closing Date specified in the Closing Notice, SOAC shall promptly (but not later than one (1) business day thereafter) return the Subscription Amount in full to the Investor; provided, that unless this Subscription Agreement has been terminated pursuant to Section 9 hereof, such return of funds shall not terminate this Subscription Agreement or relieve the Investor of its obligations to purchase the Shares at the Closing in the event SOAC delivers a subsequent Closing Notice in connection with this Section 2. For purposes of this Subscription Agreement, "business day" shall mean a day other than a Saturday, Sunday or other day on which the principal offices of the Securities Exchange Commission in Washington, D.C. and of the British Columbia Securities Commission do not accept filings, or, in the case of determining a date when any payment is due, any day on which the commercial banks in New York, New York or Vancouver, British Columbia are authorized or required by law to close.

3. Legends. Each book entry for the Investor's Shares shall contain a notation, and each certificate (if any) evidencing the Investor's Shares shall be stamped or otherwise imprinted with a legend, in substantially the following form, and in the event that no physical certificates are issued, the below constitutes written notice of the legend restriction under applicable Canadian Securities Laws (as defined below):

> THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED, OR THE SECURITIES LAWS OF ANY STATE OR OTHER JURISDICTION, AND NEITHER THE SECURITIES NOR ANY INTEREST THEREIN MAY BE OFFERED, SOLD, TRANSFERRED, PLEDGED OR OTHERWISE DISPOSED OF EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER SUCH ACT OR SUCH LAWS OR AN EXEMPTION FROM REGISTRATION UNDER SUCH ACT AND SUCH LAWS WHICH, IN THE OPINION OF COUNSEL, IS AVAILABLE.
>
> UNLESS PERMITTED UNDER CANADIAN SECURITIES LEGISLATION, THE HOLDER OF THIS SECURITY MUST NOT TRADE THE SECURITY BEFORE THE DATE THAT IS 4 MONTHS AND A DAY AFTER THE LATER OF: (i) THE DISTRIBUTION DATE, AND (ii) THE DATE THE ISSUER BECAME A REPORTING ISSUER IN ANY PROVINCE OR TERRITORY OF CANADA.

4. Closing Conditions.

a. The obligation of the parties hereto to consummate the purchase and sale of the Shares pursuant to this Subscription Agreement is subject to the following conditions:

> (i) no applicable governmental authority shall have enacted, issued, promulgated, enforced or entered any judgment, order, law, rule or regulation (whether temporary, preliminary or permanent) which is then in effect and has the effect of making the consummation of the transactions contemplated hereby illegal or otherwise restraining or prohibiting consummation of the transactions contemplated hereby, and no governmental authority shall have instituted a proceeding seeking to impose any such prevention or prohibition; and
>
> (ii) all conditions precedent to the closing of the Transaction under the Transaction Agreement shall have been satisfied or waived (as determined by the parties to the Transaction Agreement and other than those conditions under the Transaction Agreement which, by their nature, are to be fulfilled at the closing of the Transaction, including to the extent that any such condition is dependent upon the consummation of the purchase and sale of the Shares pursuant to this Subscription Agreement) and the closing of the Transaction shall be scheduled to occur concurrently with or on the same date as the Closing Date.

b. The obligation of SOAC to consummate the issuance and sale of the Shares pursuant to this Subscription Agreement shall be subject to the conditions that (i) all representations and warranties of the Investor contained in this Subscription Agreement are true and correct in all material respects at and as of the Closing Date (unless they specifically speak as of an earlier date in which case they shall be true and correct in all material respects as of such date), and the Investor hereby acknowledges that the consummation of the Closing shall constitute a reaffirmation by the Investor of each of the representations and warranties of the Investor contained in this Subscription Agreement as of the Closing Date and (ii) all obligations, covenants and agreements of the Investor required to be performed by it at or prior to the Closing Date shall have been performed in all material respects.

c. The obligation of the Investor to consummate the purchase of the Shares pursuant to this Subscription Agreement shall be subject to the following conditions: (i) all representations and warranties of SOAC contained in this Subscription Agreement shall be true and correct in all material respects (other than representations and warranties that are qualified as to materiality or Material Adverse Effect (as defined herein), which representations and warranties shall be true in all respects) at and as of the Closing Date (unless they specifically speak as of an earlier date in which case they shall be true and correct in all material respects as of such date), and SOAC hereby acknowledges that the consummation of the Closing shall constitute a reaffirmation by SOAC of each of the representations and warranties of SOAC contained in this Subscription Agreement as of the Closing Date and (ii) all obligations, covenants and agreements of SOAC required by the Subscription Agreement to be performed by it at or prior to the Closing Date shall have been performed in all material respects.

5. Further Assurances. At or prior to the Closing Date, each of SOAC, the Company and the Investor shall execute and deliver such additional documents and take such additional actions as the parties reasonably may deem to be practical and necessary in order to consummate the subscription as contemplated by this Subscription Agreement. Prior to or at the Closing, the Investor shall deliver to SOAC a duly completed and executed Internal Revenue Service Form W-9 or appropriate Form W-8, as applicable.

6. SOAC Representations and Warranties. For purposes of this Section 5, the term "SOAC" shall refer to SOAC as of the date hereof and, for purposes of only the representations contained in paragraphs (h), (i), and (j) of this Section 6 and to the extent such representations and warranties are made as of the date of the closing of the Transaction, the combined company after giving effect to the Transaction. SOAC represents and warrants to the Investor that:

a. SOAC is an exempted company duly incorporated, validly existing and in good standing under the laws of the Cayman Islands. SOAC has all power (corporate or otherwise) and authority to own, lease and operate its properties and conduct its business as presently conducted and to enter into, deliver and perform its obligations under this Subscription Agreement. As of the Closing Date, SOAC will be duly incorporated, validly existing as a corporation and in good standing under the laws of British Columbia, Canada.

b. As of the Closing Date, the Shares will be duly authorized and, when issued and delivered to the Investor against full payment therefor in accordance with the terms of this Subscription Agreement, the Shares will be validly issued, fully paid and non-assessable and will not have been issued in violation of or subject to any preemptive or similar rights created under SOAC's certificate of incorporation (as adopted on the Closing Date) or under the *Business Corporations Act* (British Columbia).

c. This Subscription Agreement has been duly authorized, executed and delivered by SOAC and, assuming that this Subscription Agreement constitutes the valid and binding agreement of the Investor, this Subscription Agreement is enforceable against SOAC in accordance with its terms, except as may be limited or otherwise affected by (i) bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium or other laws relating to or affecting the rights of creditors generally, or (ii) principles of equity, whether considered at law or equity.

d. The execution, delivery and performance of the transaction contemplated by this Agreement, including issuance and sale of the Shares, and the compliance by SOAC with all of the provisions of this Subscription Agreement and the consummation of the transactions contemplated by this Subscription Agreement will (x) be substantially done in accordance with the rules of The New York Stock Exchange (the "NYSE") and (y) will not conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under, or result in the creation or imposition of any lien, charge or encumbrance upon any of the property or assets of SOAC or any of its subsidiaries pursuant to the terms of (i) any indenture, mortgage, deed of trust, loan agreement, lease,

license or other agreement or instrument to which SOAC or any of its subsidiaries is a party or by which SOAC or any of its subsidiaries is bound or to which any of the property or assets of SOAC is subject that would reasonably be expected to have a material adverse effect on the business, properties, assets, prospects, liabilities, financial condition or results of operations of SOAC and its subsidiaries, taken as a whole (a "Material Adverse Effect") or materially affect the validity of the Shares or the legal authority of SOAC to timely comply in all material respects with the terms of this Subscription Agreement; (ii) result in any violation of the provisions of the organizational documents of SOAC; or (iii) result in any violation of any statute or any judgment, order, rule or regulation of any court or governmental agency or body, domestic or foreign, having jurisdiction over SOAC or any of its properties that would reasonably be expected to have a Material Adverse Effect or materially affect the validity of the Shares or the legal authority of SOAC to comply in all material respects with this Subscription Agreement.

e. As of their respective filing dates, all reports (the "SEC Reports") required to be filed by SOAC with the U.S. Securities and Exchange Commission (the "SEC") complied in all material respects with the applicable requirements of the Securities Act of 1933, as amended (the "Securities Act") and the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the rules and regulations of the SEC promulgated thereunder, and none of the SEC Reports, when filed, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The financial statements of SOAC included in the SEC Reports comply in all material respects with applicable accounting requirements and the rules and regulations of the SEC with respect thereto as in effect at the time of filing and fairly present in all material respects the financial position of SOAC as of and for the dates thereof and the results of operations and cash flows for the periods then ended, subject, in the case of unaudited statements, to normal, year-end audit adjustments. A copy of each SEC Report is available to the Investor via the SEC's EDGAR system. There are no outstanding or unresolved comments in comment letters received by SOAC from the staff of the Division of Corporation Finance of the SEC with respect to any of the SEC Reports.

f. Assuming the accuracy of the Investor's representations and warranties set forth in Section 7, no registration under the Securities Act or filing of a prospectus under applicable Canadian Securities Laws is required for the offer and sale of the Shares by SOAC to the Investor hereunder. The Shares (i) were not offered by any form of general solicitation or general advertising and (ii) are not being offered in a manner involving a public offering under, or in a distribution in violation of, the Securities Act, or any state securities laws or under any Canadian Securities Laws.

g. Except for placement fees payable to Citigroup Global Markets Inc., Nomura Securities International, Inc. and Fearnley Securities, Inc., in their capacity as placement agents for the offer and sale of the Shares (in such capacity, collectively, the "Placement Agents"), which fees are payable by SOAC, SOAC has not paid, and is not obligated to pay, any brokerage, finder's or other commission or similar fee in connection with its issuance and sale of the Shares, including, for the avoidance of doubt, any fee or commission payable to any stockholder or affiliate of SOAC.

h. SOAC is in compliance with all applicable law, except where such non-compliance would not have a Material Adverse Effect. SOAC has not received any written communication from a governmental entity that alleges that SOAC is not in compliance with or is in default or violation of any applicable law, except where such non-compliance, default or violation would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect.

i. Except for such matters as have not had and would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect, there is no (i) action, suit, claim or other proceeding, in each case by or before any governmental authority pending, or, to the knowledge of SOAC, threatened against SOAC or (ii) judgment, decree, injunction, ruling or order of any governmental entity or arbitrator outstanding against SOAC.

j. SOAC is not, and immediately after receipt of payment for the Shares will not be, an "investment company" within the meaning of the Investment Company Act of 1940, as amended.

k. SOAC is not in default or violation (and no event has occurred which, with notice or the lapse of time or both, would constitute a default or violation) of any term, condition or provision of (i) SOAC's charter documents, (ii) any loan or credit agreement, note, bond, mortgage, indenture, lease or other agreement, permit, franchise or license to which SOAC is now a party or by which SOAC's properties or assets are bound or (iii) any statute or

any judgment, order, rule or regulation of any court or governmental agency or body, domestic or foreign, having jurisdiction over SOAC or any of its properties, except, in the case of clauses (ii) and (iii), for defaults or violations that have not had and would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect.

l. Other than the Other Subscription Agreements, the Transaction Agreement and any other agreement contemplated by the Transaction Agreement, SOAC has not entered into any side letter or similar agreement with any Other Investor or any other investor in connection with such Other Investor's or investor's direct or indirect investment in SOAC (other than any side letter or similar agreement relating to the transfer to any investor of (i) securities of SOAC by existing securityholders of SOAC, which may be effectuated as a forfeiture to SOAC and reissuance, or (ii) securities to be issued to the direct or indirect securityholders of the Company pursuant to the Transaction Agreement). No Other Subscription Agreement includes terms and conditions that are materially more advantageous to any such Other Investor than the Investor hereunder, and such Other Subscription Agreements have not been amended or modified in any material respect following the date of this Subscription Agreement.

m. SOAC is not required to obtain any consent, waiver, authorization or order of, give any notice to, or make any filing or registration with, any court or other federal, state, local or other governmental authority, self-regulatory organization or other person in connection with the execution, delivery and performance by SOAC of this Subscription Agreement (including, without limitation, the issuance of the Shares), other than (i) filings with the SEC, (ii) filings required by applicable state securities laws, (iii) filings required by NYSE, or such other applicable stock exchange on which SOAC's common equity is then listed, and (iv) filings, the failure of which to obtain would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect.

n. As of the date of this Subscription Agreement, the authorized capital stock of SOAC consists of 300,000,000 Class A ordinary shares, par value $0.0001 per share (the "Class A Shares"), 30,000,000 Class B ordinary shares, par value $0.0001 per share (the "Class B Shares"), and 1,000,000 preference shares, par value $0.0001 per share. As of the date of this Subscription Agreement, (i) 30,000,000 Class A Shares are issued and outstanding, (ii) 7,500,00 Class B Shares are issued and outstanding, (iii) 9,500,000 private placement warrants, and (iv) 15,000,000 public warrants are outstanding. All (i) issued and outstanding Class A Shares and Class B Shares have been duly authorized and validly issued, are fully paid and are non-assessable and are not subject to preemptive rights and (ii) outstanding warrants have been duly authorized and validly issued, are fully paid and are not subject to preemptive rights. Except as set forth above and pursuant to the Transaction Agreement and the other agreements and arrangements referred to therein or in the SEC Reports, as of the date hereof, there are no outstanding options, warrants or other rights to subscribe for, purchase or acquire from SOAC any Class A Shares, Class B Shares or other equity interests in SOAC, or securities convertible into or exchangeable or exercisable for such equity interests.

7. Investor Representations and Warranties. The Investor represents and warrants to, and covenants with, SOAC and the Placement Agents that:

a. If the Investor is, or is subscribing for the account or benefit of, a person in the United States or a U.S. Person (as defined in Rule 902(k) of Regulation S), the Investor or each of the funds managed by or affiliated with the Investor for which the Investor is acting as nominee, as applicable (i) is a "qualified institutional buyer" (as defined in Rule 144A under the Securities Act), or an institutional "accredited investor" (within the meaning of Rule 501(a) (1), (2), (3), (7), (8) or (9) under the Securities Act), in each case, satisfying the applicable requirements set forth on Schedule A, (ii) is acquiring the Shares only for his, her or its own account and not for the account of others, or if the Investor is subscribing for the Shares as a fiduciary or agent for one or more investor accounts, the Investor has full investment discretion with respect to each such account, and the full power and authority to make the acknowledgements, representations and agreements herein on behalf of each owner of each such account, and (iii) is not acquiring the Shares with a view to, or for offer or sale in connection with, any distribution thereof in violation of the Securities Act (and shall provide the requested information set forth on Schedule A). The Investor is not an entity formed for the specific purpose of acquiring the Shares and (i) is an "institutional account" as defined by FINRA Rule 4512(c) or (ii) the investment manager, fiduciary, or agent that has been delegated investment decision making authority for the Investor is an "institutional account" as defined by FINRA Rule 4512(c).

b. The Investor acknowledges and agrees that SOAC may complete additional financings in the future to develop its business and fund its ongoing development, and such future financings may have a dilutive effect on current securityholders of SOAC, including the Investor, but there is no assurance that such financing will be available, on reasonable terms or at all, and if not available, SOAC may be unable to fund its ongoing development.

c. The Investor acknowledges and agrees that the Shares are being offered in a transaction not involving any public offering within the meaning of the Securities Act and that the Shares have not been registered under the Securities Act. The Investor acknowledges and agrees that the Shares may not be offered, resold, transferred, pledged or otherwise disposed of by the Investor absent an effective registration statement under the Securities Act except (i) to SOAC or a subsidiary thereof, (ii) to non-U.S. persons pursuant to offers and sales that occur outside the United States within the meaning of Regulation S under the Securities Act or (iii) pursuant to another applicable exemption from the registration requirements of the Securities Act, and in each of clauses (i) and (iii) in accordance with any applicable securities laws of the states and other jurisdictions of the United States, and that any certificates representing the Shares shall contain the restrictive legend to such effect outlined in Section 3 hereof. The Investor acknowledges and agrees that the Shares will be subject to transfer restrictions and, as a result of these transfer restrictions, the Investor may not be able to readily offer, resell, transfer, pledge or otherwise dispose of the Shares and may be required to bear the financial risk of an investment in the Shares for an indefinite period of time. The Investor acknowledges and agrees that the Shares will not be eligible for offer, resale, transfer, pledge or disposition pursuant to Rule 144 promulgated under the Securities Act ("Rule 144") until at least one year from the Closing Date. The Investor acknowledges and agrees that it has been advised to consult legal counsel and tax and accounting advisors prior to making any offer, resale, transfer, pledge or disposition of any of the Shares.

d. The Investor acknowledges and agrees that the Investor is purchasing the Shares directly from SOAC. The Investor further acknowledges that there have been no representations, warranties, covenants and agreements made to the Investor by or on behalf of SOAC, the Company, any of their respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing or any other person or entity, expressly or by implication, other than those representations, warranties, covenants and agreements of SOAC expressly set forth in Section 6 of this Subscription Agreement.

e. The Investor acknowledges that no person has made any written or oral representations (i) that any person will resell or repurchase the Shares; (ii) that any person will refund the purchase price of the Shares; or (iii) as to the future price or value of the Shares.

f. The Investor's acquisition and holding of the Shares will not constitute or result in a non-exempt prohibited transaction under Section 406 of the Employee Retirement Income Security Act of 1974, as amended, Section 4975 of the Internal Revenue Code of 1986, as amended, or any applicable similar law.

g. The Investor is not, and is not acting on behalf of, (i) an "employee benefit plan" subject to Title I of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"), (ii) an individual retirement account or annuity or other "plan" that is subject to Section 4975 of the Internal Revenue Code of 1986, as amended (the "Code"), (iii) any entity or account that is deemed under the Department of Labor regulation codified at 29 C.F.R. § 2510.3-101, as modified by Section 3(42) of ERISA, to include "plan assets" of any "employee benefit plan" subject to ERISA or "plan" subject to Code §4975, or (iv) any other plan subject to non-U.S., state, local or other federal laws or regulations that are substantially similar to the foregoing provisions of ERISA or the Code.

h. The Investor acknowledges and agrees that the Investor has received such information as the Investor deems necessary in order to make an investment decision with respect to the Shares, including, with respect to SOAC, the Transaction and the business of the Company and its subsidiaries. Without limiting the generality of the foregoing, the Investor acknowledges that Investor has had the opportunity to review SOAC's filings with the SEC. The Investor acknowledges and agrees that the Investor and the Investor's professional advisor(s), if any, have had the full opportunity to ask such questions, receive such answers and obtain such information as the Investor and such Investor's professional advisor(s), if any, have deemed necessary to make an investment decision with respect to the Shares.

i. The Investor became aware of this offering of the Shares solely by means of direct contact between the Investor and SOAC, the Company or a representative of SOAC or the Company, and the Shares were offered to the Investor solely by direct contact between the Investor and SOAC, the Company or a representative of SOAC or the Company. The Investor did not become aware of this offering of the Shares, nor were the Shares offered to the Investor, by any other means. The Investor acknowledges that the Shares (i) were not offered by any form of general solicitation or general advertising and (ii) are not being offered in a manner involving a public offering under, or in a distribution in violation of, the Securities Act, or any state securities laws. The Investor acknowledges that it is not relying upon, and has not relied upon, any statement, representation or warranty made by any person, firm or corporation (including, without limitation, SOAC, the Company, the Placement Agents, any of their respective

affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing), other than the representations and warranties of SOAC contained in Section 6 of this Subscription Agreement, in making its investment or decision to invest in SOAC.

j. The Investor acknowledges that it is aware that there are substantial risks incident to the purchase and ownership of the Shares, including those set forth in SOAC's filings with the SEC. The Investor is a sophisticated investor, has such knowledge and experience in financial and business matters as to be capable of evaluating the merits and risks of an investment in the Shares, and the Investor has sought such accounting, legal and tax advice as the Investor has considered necessary to make an informed investment decision. The Investor (or the investment manager, fiduciary, or agent that has been delegated decision-making authority on behalf of Investor) has made its own assessment and has satisfied itself concerning relevant tax and other economic considerations relative to its purchase of the Shares and acknowledges that the Investor shall be responsible for any of the Investor's tax liabilities that may arise as a result of the transactions contemplated by this Subscription Agreement, and that SOAC has not provided any tax advice or any other representation or guarantee regarding the tax consequences of the transactions contemplated by this Subscription Agreement. The Investor will not look to the Placement Agents for all or part of any such loss or losses the Investor may suffer, is able to sustain a complete loss on its investment in the Shares, has no need for liquidity with respect to its investment in the Shares and has no reason to anticipate any change in circumstances, financial or otherwise, which may cause or require any sale or distribution of all or any part of the Shares.

k. Alone, or together with any professional advisor(s), the Investor has adequately analyzed and fully considered the risks of an investment in the Shares and determined that the Shares are a suitable investment for the Investor and that the Investor is able at this time and in the foreseeable future to bear the economic risk of a total loss of the Investor's investment in SOAC. The Investor acknowledges specifically that a possibility of total loss exists.

l. In making its decision to purchase the Shares, the Investor has relied solely upon independent investigation made by the Investor. Without limiting the generality of the foregoing, the Investor has not relied on any statements or other information provided by or on behalf of the Placement Agents or any of their respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing concerning SOAC, the Company, the Transaction, the Transaction Agreement, this Subscription Agreement or the transactions contemplated hereby or thereby, the Shares or the offer and sale of the Shares. The Placement Agents shall not have any liability or obligation (including without limitation, for or with respect to any losses, claims, damages, obligations, penalties, judgments, awards, liabilities, costs, expenses or disbursements incurred by the Investor), whether in contract, tort or otherwise, to the Investor, in respect of the Transaction.

m. The Investor acknowledges that the Placement Agents: (i) have not provided the Investor with any information or advice with respect to the Shares, (ii) have not made or make any representation, express or implied as to SOAC, the Company, the Company's credit quality, the Shares or the Investor's purchase of the Shares, (iii) have not acted as the Investor's financial advisor or fiduciary in connection with the issue and purchase of Shares, (iv) may have acquired, or during the term of the Shares may acquire, non-public information with respect to the Company, which, subject to the requirements of applicable law, the Investor agrees need not be provided to it, (v) may have existing or future business relationships with SOAC and the Company (including, but not limited to, lending, depository, risk management, advisory and banking relationships) and will pursue actions and take steps that it deems or they deem necessary or appropriate to protect its or their interests arising therefrom without regard to the consequences for a holder of Shares, and that certain of these actions may have material and adverse consequences for a holder of Shares.

n. The Investor acknowledges that it has not relied on the Placement Agents in connection with its determination as to the legality of its acquisition of the Shares or as to the other matters referred to herein and the Investor has not relied on any investigation that the Placement Agents, any of their affiliates or any person acting on their behalf have conducted with respect to the Shares, SOAC or the Company. The Investor further acknowledges that it has not relied on any information contained in any research reports prepared by the Placement Agents or any of their affiliates.

o. The Investor acknowledges and agrees that no federal, provincial or state agency, securities commission or similar authority has reviewed, has passed upon or endorsed the merits of the offering of the Shares or made any findings or determination as to the fairness of this investment, and that any representation to the contrary is an offence.

p. The Investor, if not an individual, has been duly formed or incorporated and is validly existing and is in good standing under the laws of its jurisdiction of formation or incorporation, with power and authority to enter into, deliver and perform its obligations under this Subscription Agreement.

q. The execution, delivery and performance by the Investor of this Subscription Agreement are within the powers of the Investor, have been duly authorized and will not constitute or result in a breach or default under or conflict with any order, ruling or regulation of any court or other tribunal or of any governmental commission or agency, or any agreement or other undertaking, to which the Investor is a party or by which the Investor is bound, and, if the Investor is not an individual, will not violate any provisions of the Investor's organizational documents, including, without limitation, its incorporation or formation papers, bylaws, indenture of trust or partnership or operating agreement, as may be applicable. The signature on this Subscription Agreement is genuine, and the signatory, if the Investor is an individual, has legal competence and capacity to execute the same or, if the Investor is not an individual, the signatory has been duly authorized to execute the same, and, assuming that this Subscription Agreement constitutes the valid and binding obligation of SOAC, this Subscription Agreement constitutes a legal, valid and binding obligation of the Investor, enforceable against the Investor in accordance with its terms except as may be limited or otherwise affected by (i) bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium or other laws relating to or affecting the rights of creditors generally, and (ii) principles of equity, whether considered at law or equity.

r. The Investor is not (i) a person or entity named on the List of Specially Designated Nationals and Blocked Persons administered by the U.S. Treasury Department's Office of Foreign Assets Control ("OFAC") or in any Executive Order issued by the President of the United States and administered by OFAC ("OFAC List"), or a person or entity prohibited by any OFAC sanctions program, (ii) owned, directly or indirectly, or controlled by, or acting on behalf of, one or more persons that are named on the OFAC List; (iii) organized, incorporated, established, located, resident or born in, or a citizen, national or the government, including any political subdivision, agency or instrumentality thereof, of, Cuba, Iran, North Korea, Syria, the Crimea region of Ukraine or any other country or territory embargoed or subject to substantial trade restrictions by the United States, (iv) a Designated National as defined in the Cuban Assets Control Regulations, 31 C.F.R. Part 515, or (v) a non-U.S. shell bank or providing banking services indirectly to a non-U.S. shell bank (each, a "Prohibited Investor"). The Investor agrees to provide law enforcement agencies, if requested thereby, such records as required by applicable law, provided that the Investor is permitted to do so under applicable law. If the Investor is a financial institution subject to the Bank Secrecy Act (31 U.S.C. Section 5311 et seq.) (the "BSA"), as amended by the USA PATRIOT Act of 2001 (the "PATRIOT Act"), and its implementing regulations (collectively, the "BSA/PATRIOT Act"), the Investor maintains policies and procedures reasonably designed to comply with applicable obligations under the BSA/PATRIOT Act. To the extent required, it maintains policies and procedures reasonably designed to ensure compliance with OFAC-administered sanctions programs, including for the screening of its investors against the OFAC sanctions programs, including the OFAC List. To the extent required by applicable law, the Investor maintains policies and procedures reasonably designed to ensure that the funds held by the Investor and used to purchase the Shares were legally derived and were not obtained, directly or indirectly, from a Prohibited Investor.

s. No disclosure or offering document has been prepared by the Placement Agents or any of their respective affiliates in connection with the offer and sale of the Shares.

t. None of the Placement Agents, nor any of their respective affiliates nor any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing have made any independent investigation with respect to SOAC, the Company or its subsidiaries or any of their respective businesses, or the Shares or the accuracy, completeness or adequacy of any information supplied to the Investor by SOAC.

u. The Investor has or has commitments to have and, when required to deliver payment to SOAC pursuant to Section 2 above, will have, sufficient funds to pay the Subscription Amount and consummate the purchase and sale of the Shares pursuant to this Subscription Agreement.

v. The funds used to purchase the Shares which will be advanced by the Investor to SOAC hereunder will not represent proceeds of crime for the purposes of the *Criminal Code* (Canada) or the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act* (Canada) (collectively, "Anti-Money Laundering Laws") and the Investor acknowledges that SOAC may in the future be required by law to disclose the Investor's name and other information relating to this Subscription Agreement and the Investor's subscription hereunder, on a confidential basis, pursuant to the Anti-Money Laundering Laws and the legislation, regulations or instruments enacting Canadian Economic

Sanctions (as defined below). The Investor is not a person or entity identified on a list established under any Anti-Money Laundering Law (including, without limitation, Section 83.05 of the Criminal Code (Canada)) and the Investor is not a person or entity identified in the legislation or regulations enacting any economic or financial sanctions, laws, regulations, embargoes, or restrictive measures imposed, administered or enforced by Canada, including but not limited to, the provisions of the *United Nations Act* (Canada), the *Special Economic Measures Act* (Canada) or any other economic sanctions laws administered by applicable Canadian regulatory authorities (collectively, "Canadian Economic Sanctions"). To the best of its knowledge, none of the subscription funds to be provided by the Investor: (i) have been or will be derived from or related to any activity that is deemed criminal under the laws of Canada, the United States, or any other jurisdiction; or (ii) are being tendered on behalf of a person or entity who has not been identified to the Investor, and the Investor will promptly notify SOAC if the Investor discovers that any of such representations cease to be true and provide SOAC with appropriate information in connection therewith; none of the funds the Investor is using to purchase the Shares are, to the knowledge of the Investor, proceeds obtained or delivered, directly or indirectly, as a result of illegal activities.

w. The Investor acknowledges and agrees that the sale and delivery of the Shares is conditional upon such sale being exempt from the requirements under the securities laws and regulations of each of the provinces and territories of Canada ("Canadian Securities Laws") as to the filing and delivery of a prospectus and that the Shares have not been qualified under a prospectus under Canadian Securities Laws. The Investor acknowledges that SOAC, as of the date hereof, is not a "reporting issuer" in any jurisdiction in Canada, that the Shares are subject to statutory resale restrictions under applicable Canadian Securities Laws of the province of which the Investor resides (as applicable) and under other applicable Canadian Securities Laws which resale restrictions may apply outside of Canada, and the Investor covenants that it will not resell the Shares except in compliance with such laws

x. If the Investor is located in or subject to the securities laws of a province or territory of Canada:

(i) the Investor (i) is an "accredited investor" (as defined in *National Instrument 45-106 – Prospectus Exemptions* or Section 73.3(1) of the *Securities Act* (Ontario), as applicable) in each case, satisfying the applicable requirements set forth on Schedule B, (ii) is acquiring the Shares as principal for its own account and not as agent or for the benefit of any other person or is deemed under *National Instrument 45-106 – Prospectus Exemptions* or the *Securities Act* (Ontario), as applicable, to be purchasing the Shares as principal, (iii) was not created, and is not being used, solely to purchase or hold securities as an "accredited investor", (iv) is not acquiring the Shares with a view to, or for offer or sale in connection with, any distribution thereof in violation of Canadian Securities Laws, (v) is a "permitted client" (as defined in *National Instrument 31-103 – Registration Requirements, Exemptions and Ongoing Registrant Obligations*) satisfying the applicable requirements set forth on Schedule C, and (vi) has completed Schedule B and Schedule C hereto and the information contained therein is accurate and complete.

(ii) the Investor acknowledges receipt of the presentation entitled " Revolutionizing the Mineral Supply Chain for Fast Growing EV Demand – Investment summary for The Metals Company, Inc." dated March 4, 2021 (the "Investor Presentation"), including the "Notice to Canadian Investors" therein, and that, except for the Investor Presentation, it has not received or been provided with, nor has it requested, nor does it have any need to receive, any offering memorandum (within the meaning of Canadian Securities Laws), any prospectus, sales or advertising literature, or any other document describing or purporting to describe SOAC, its business and affairs or the transactions contemplated herein (including the Transaction) which has been prepared for delivery to, and review by, prospective investors in order to assist them in making an investment decision in respect of the Shares.

y. The Investor acknowledges that:

(i) this Subscription Agreement requires the Investor to provide certain personal information relating to the Investor to SOAC and the Placement Agents. Such information is being collected and will be used by SOAC and the Placement Agents for the purposes of completing the offering, which includes, without limitation, determining the Investor's eligibility to purchase the Shares under applicable securities laws, preparing and registering certificates representing securities or arranging for non-certificated, electronic delivery of same, and completing filings required by any securities regulatory authority or stock exchange. Such personal information may be disclosed by SOAC or the Placement Agents to (a) securities regulatory authorities and stock exchanges, (b) SOAC's registrar and

transfer agent, (c) any government agency, board or other entity and (d) any of the other parties involved in the offering, including the legal counsel of SOAC, and may be included in record books in connection with the offering. By executing this Subscription Agreement, the Investor expressly consents to the foregoing collection, use and disclosure of such personal information; and

(ii) the Investor acknowledges being notified that if the Investor is resident or otherwise subject to the applicable securities legislation of a jurisdiction in Canada: (i) SOAC or the Placement Agents will deliver to the applicable securities regulatory authority or regulator certain personal information pertaining to the Investor, including its full name, residential address and telephone number, email address, the number of Shares purchased by the Investor, the aggregate purchase price paid for such Shares, the prospectus exemption relied on and the date of distribution of the Shares, (ii) such information is being collected indirectly by the applicable securities regulatory authority or regulator under the authority granted to it in securities legislation, (iii) such information is being collected for the purposes of the administration and enforcement of the securities legislation of the local Canadian jurisdiction, and (iv) the Investor may contact the public officials listed on Schedule D hereto with respect to questions about the security regulatory authority's or regulator's indirect collection of such information.

z. It is the express wish of the Investor that this Subscription Agreement and any related documentation be drawn up in the English language only. *Il est de la volonté expresse de l'investisseur que la présente convention de souscription ainsi que toute documentation connexe soient rédigées en langue anglaise uniquement.*

8. Registration Rights.

a. In the event that the Shares are not registered in connection with the consummation of the Transaction, SOAC agrees that, within forty-five (45) calendar days after the Closing Date, it will file with the SEC (at its sole cost and expense) a registration statement registering the resale of the Shares (the "Registration Statement"), and it shall use its commercially reasonable efforts to have the Registration Statement declared effective as soon as practicable after the filing thereof , but no later than the earlier of (i) ninety (90) calendar days after the filing thereof (or one hundred twenty (120) calendar days after the filing thereof if the SEC notifies SOAC that it will "review" the Registration Statement) and (ii) ten (10) business days after SOAC is notified (orally or in writing, whichever is earlier) by the SEC that the Registration Statement will not be "reviewed" or will not be subject to further review; provided, however, that if such date falls on a Saturday, Sunday or other day that the SEC is closed for business, such date shall be extended to the next business day on which the SEC is open for business. SOAC agrees to cause such Registration Statement, or another shelf registration statement that includes the Shares to be sold pursuant to this Subscription Agreement, to remain effective until the earliest of (i) the third anniversary of the Closing, (ii) the date on which the Investor ceases to hold any Shares issued pursuant to this Subscription Agreement, or (iii) on the first date on which the Investor is able to sell all of its Shares issued pursuant to this Subscription Agreement (or shares received in exchange therefor) under Rule 144 within ninety (90) days without the public information required under Rule 144(c)(i) (or Rule 144(i)(2), if applicable), volume or manner of sale limitations of such rule (such date, the "End Date"). For as long as the Investor holds the Shares, SOAC will use commercially reasonable efforts to file all reports, and provide all customary and reasonable cooperation, necessary to enable the Investor to resell the Shares pursuant to the Registration Statement or Rule 144 of the Securities Act (when Rule 144 of the Securities Act becomes available to the Investor), as applicable. Prior to the End Date, SOAC will use commercially reasonable efforts to qualify the Shares for listing on the applicable stock exchange. The Investor agrees to disclose its ownership to SOAC upon request to assist it in making the determination with respect to Rule 144 described in clause (iii) above. SOAC may amend the Registration Statement so as to convert the Registration Statement to a Registration Statement on Form S-3 at such time after SOAC becomes eligible to use such Form S-3. The Investor acknowledges and agrees that SOAC may suspend the use of any such registration statement if it determines that in order for such registration statement not to contain a material misstatement or omission, an amendment thereto would be needed to include information that would at that time not otherwise be required in a current, quarterly, or annual report under the Exchange Act, provided, that, (I) SOAC shall not so delay filing or so suspend the use of the Registration Statement for a period of more than ninety (90) consecutive days or more than a total of one hundred-twenty (120) calendar days in any three hundred sixty (360) day period and (II) SOAC shall use commercially reasonable efforts to make such Registration Statement available for the sale by the Investor of such securities as soon as practicable thereafter. SOAC's obligations to include the Shares issued pursuant to this Subscription Agreement (or shares issued in exchange therefor) for resale in the Registration Statement are

contingent upon the Investor furnishing in writing to SOAC such information regarding the Investor, the securities of SOAC held by the Investor and the intended method of disposition of such Shares, which shall be limited to non-underwritten public offerings, as shall be reasonably requested by SOAC to effect the registration of such Shares, and shall execute such documents in connection with such registration as SOAC may reasonably request that are customary of a selling stockholder in similar situations.

b. SOAC shall, notwithstanding any termination of this Subscription Agreement, indemnify, defend and hold harmless Investor (to the extent a seller under the Registration Statement), the officers, directors, trustees, agents, partners, members, managers, stockholders, affiliates, employees and investment advisers of each of them, each person who controls Investor (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) and the officers, directors, trustees, agents, partners, members, managers, stockholders, affiliates, employees and investment advisers of each such controlling person, to the fullest extent permitted by applicable law, from and against any and all losses, claims, damages, liabilities, costs (including, without limitation, reasonable out-of-pocket costs of preparation and investigation and reasonable attorneys' fees) and expenses (collectively, "Losses"), as incurred, that arise out of or are based upon any untrue or alleged untrue statement of a material fact contained in the Registration Statement, any prospectus included in the Registration Statement or any form of prospectus or in any amendment or supplement thereto or in any preliminary prospectus, or arising out of or relating to any omission or alleged omission to state a material fact required to be stated therein or necessary to make the statements therein (in the case of any prospectus or form of prospectus or supplement thereto, in light of the circumstances under which they were made) not misleading, except insofar as the same are caused by or contained in any information furnished in writing to SOAC by or on behalf of the Investor expressly for use therein.

c. Investor shall, severally and not jointly with any other Investor, indemnify and hold harmless SOAC, its directors, officers, agents and employees, each person who controls SOAC (within the meaning of Section 15 of the Securities Act and Section 20 of the Exchange Act), and the directors, officers, agents or employees of such controlling persons, to the fullest extent permitted by applicable law, from and against all Losses, as incurred, arising out of or are based upon any untrue or alleged untrue statement of a material fact contained in any Registration Statement, any prospectus included in the Registration Statement, or any form of prospectus, or in any amendment or supplement thereto or in any preliminary prospectus, or arising out of or relating to any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein (in the case of any prospectus, or any form of prospectus or supplement thereto, in light of the circumstances under which they were made) not misleading to the extent, but only to the extent, that such untrue statements or omissions are based solely upon information regarding Investor furnished in writing to SOAC by Investor expressly for use therein. In no event shall the liability of Investor be greater in amount than the dollar amount of the net proceeds received by Investor upon the sale of the Shares giving rise to such indemnification obligation. Notwithstanding the forgoing, Investor's indemnification obligations shall not apply to amounts paid in settlement of any Losses or action if such settlement is effected without the prior written consent of Investor (which consent shall not be unreasonably withheld, conditioned or delayed).

9. Termination. This Subscription Agreement shall terminate and be void and of no further force and effect, and all rights and obligations of the parties hereunder shall terminate without any further liability on the part of any party in respect thereof, upon the earliest to occur of (a) such date and time as the Transaction Agreement is terminated in accordance with its terms prior to the occurrence of the Transaction Closing, (b) upon the mutual written agreement of each of the parties hereto and the Company to terminate this Subscription Agreement, (c) thirty (30) days after the Termination Date (as defined in the Transaction Agreement), if the Closing has not occurred by such date other than as a result of a breach of Investor's obligations hereunder, or (d) if any of the conditions to Closing set forth in Section 4 of this Subscription Agreement are (i) not satisfied or waived prior to the Closing or (ii) not capable of being satisfied on the Closing and, in each case of (i) and (ii), as a result thereof, the transactions contemplated by this Subscription Agreement will not be and are not consummated at the Closing (the termination events described in clauses (a)–(d) above, collectively, the "Termination Events"); provided that nothing herein will relieve any party from liability for any willful breach hereof prior to the time of termination, and each party will be entitled to any remedies at law or in equity to recover losses, liabilities or damages arising from any such willful breach. SOAC shall notify the Investor in writing of the termination of the Transaction Agreement as promptly as practicable after the termination of such agreement. Upon the occurrence of any Termination Event, this Subscription Agreement shall be void and of no further effect and any monies paid by the Investor to SOAC in connection herewith shall promptly (and in any event within one (1) business day) following the Termination Event be returned to the Investor.

10. Trust Account Waiver. The Investor acknowledges that SOAC is a blank check company with the powers and privileges to effect a merger, asset acquisition, reorganization or similar business combination involving SOAC and one or more businesses or assets. The Investor further acknowledges that, as described in SOAC's prospectus relating to its initial public offering dated March 17, 2020 (the "Prospectus") available at www.sec.gov, substantially all of SOAC's assets consist of the cash proceeds of SOAC's initial public offering and private placement of its securities, and substantially all of those proceeds have been deposited in a trust account (the "Trust Account") for the benefit of SOAC, its public shareholders and the underwriters of SOAC's initial public offering. Except with respect to interest earned on the funds held in the Trust Account that may be released to SOAC to pay its tax obligations and to fund certain of its working capital requirements, the cash in the Trust Account may be disbursed only for the purposes set forth in the Prospectus. For and in consideration of SOAC entering into this Subscription Agreement, the receipt and sufficiency of which are hereby acknowledged, the Investor hereby irrevocably waives any and all right, title and interest, or any claim of any kind it has or may have in the future, in or to any monies held in the Trust Account, and agrees not to seek recourse against the Trust Account as a result of, or arising out of, this Subscription Agreement; provided, however, that nothing in this Section 10 shall be deemed to limit the Investor's right, title, interest or claim to any monies held in the Trust Account by virtue of its record or beneficial ownership of Shares currently outstanding on the date hereof, pursuant to a validly exercised redemption right with respect to any such Shares, except to the extent that the Investor has otherwise agreed with SOAC to not exercise such redemption right.

11. Miscellaneous.

a. Neither this Subscription Agreement nor any rights that may accrue to the parties hereunder (other than the Shares acquired hereunder, if any) may be transferred or assigned without the prior written consent of each of the other parties hereto; provided that (i) this Subscription Agreement and any of the Investor's rights and obligations hereunder may be assigned to any fund or account managed by the same investment manager as the Investor or by an affiliate (as defined in Rule 12b-2 of the Exchange Act) of such investment manager without the prior consent of SOAC and (ii) the Investor's rights under Section 8 may be assigned to an assignee or transferee of the Shares; provided further that prior to such assignment any such assignee shall agree in writing to be bound by the terms hereof; provided, that no assignment pursuant to clause (i) of this Section 11 shall relieve the Investor of its obligations hereunder.

b. SOAC may request from the Investor such additional information as SOAC may reasonably deem necessary to register the resale of the Shares and evaluate the eligibility of the Investor to acquire the Shares, and the Investor shall promptly provide such information as may reasonably be requested to the extent readily available; provided, that, SOAC agrees to keep any such information provided by Investor confidential except (i) as necessary to include in any registration statement SOAC is required to file hereunder, (ii) as required by the federal securities law or pursuant to other routine proceedings of regulatory authorities or (iii) to the extent such disclosure is required by law, at the request of the staff of the SEC or regulatory agency or under the regulations of any national securities exchange on which SOAC's securities are listed for trading. The Investor acknowledges and agrees that if it does not provide SOAC with such requested information, SOAC may not be able to register the Investor's Shares for resale pursuant to Section 8 hereof. The Investor acknowledges that SOAC may file a copy of this Subscription Agreement (or a form of this Subscription Agreement) with the SEC as an exhibit to a periodic report or a registration statement of SOAC.

c. The Investor acknowledges that SOAC, the Company, the Placement Agents and others will rely on the acknowledgments, understandings, agreements, representations and warranties contained in this Subscription Agreement, including Schedule A hereto. Prior to the Closing, the Investor agrees to promptly notify SOAC, the Company and the Placement Agents if any of the acknowledgments, understandings, agreements, representations and warranties set forth in Section 7 above are no longer accurate in any material respect (other than those acknowledgments, understandings, agreements, representations and warranties qualified by materiality, in which case the Investor shall notify SOAC and the Placement Agents if they are no longer accurate in any respect). The Investor acknowledges and agrees that each purchase by the Investor of Shares from SOAC will constitute a reaffirmation of the acknowledgments, understandings, agreements, representations and warranties herein (as modified by any such notice) by the Investor as of the time of such purchase.

d. SOAC, the Company and the Placement Agents are each entitled to rely upon this Subscription Agreement and each is irrevocably authorized to produce this Subscription Agreement or a copy hereof to any interested party in any administrative or legal proceeding or official inquiry with respect to the matters covered hereby; provided, however, that the foregoing clause of this Section 11.d shall not give the Company or the Placement Agents any rights other than those expressly set forth herein and, without limiting the generality of the foregoing and for the avoidance of doubt, in no event shall the Company be entitled to rely on any of the representations and warranties of SOAC set forth in this Subscription Agreement.

e. All of the agreements, representations and warranties made by each party hereto in this Subscription Agreement shall survive the Closing.

f. This Subscription Agreement may not be modified, waived or terminated (other than pursuant to the terms of Section 9 above) except by an instrument in writing, signed by each of the parties hereto, provided, however, that no modification or waiver by SOAC of the provisions of this Subscription Agreement shall be effective without the prior written consent of the Company (other than modifications or waivers that are solely ministerial in nature or otherwise immaterial and do not affect any economic or any other material term of this Subscription Agreement). No failure or delay of either party in exercising any right or remedy hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such right or power, or any abandonment or discontinuance of steps to enforce such right or power, or any course of conduct, preclude any other or further exercise thereof or the exercise of any other right or power. The rights and remedies of the parties hereunder are cumulative and are not exclusive of any rights or remedies that they would otherwise have hereunder.

g. This Subscription Agreement (including the schedule hereto) constitutes the entire agreement, and supersedes all other prior agreements, understandings, representations and warranties, both written and oral, among the parties, with respect to the subject matter hereof. Except as set forth in Section 9, Section 11.c, Section 11.d, Section 11.f, this Section 11.g, the last sentence of Section 11.k and Section 12 with respect to the persons specifically referenced therein, and Section 7 with respect to the Placement Agents, this Subscription Agreement shall not confer any rights or remedies upon any person other than the parties hereto, and their respective successors and assigns, and the parties hereto acknowledge that such persons so referenced are third party beneficiaries of this Subscription Agreement with right of enforcement for the purposes of, and to the extent of, the rights granted to them, if any, pursuant to the applicable provisions.

h. Except as otherwise provided herein, this Subscription Agreement shall be binding upon, and inure to the benefit of the parties hereto and their heirs, executors, administrators, successors, legal representatives, and permitted assigns, and the agreements, representations, warranties, covenants and acknowledgments contained herein shall be deemed to be made by, and be binding upon, such heirs, executors, administrators, successors, legal representatives and permitted assigns.

i. If any provision of this Subscription Agreement shall be adjudicated by a court of competent jurisdiction to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions of this Subscription Agreement shall not in any way be affected or impaired thereby and shall continue in full force and effect.

j. This Subscription Agreement may be executed in one or more counterparts (including by facsimile or electronic mail or in .pdf) and by different parties in separate counterparts, with the same effect as if all parties hereto had signed the same document. All counterparts so executed and delivered shall be construed together and shall constitute one and the same agreement.

k. The parties hereto acknowledge and agree that irreparable damage would occur in the event that any of the provisions of this Subscription Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that the parties shall be entitled to an injunction or injunctions to prevent breaches of this Subscription Agreement, without posting a bond or undertaking and without proof of damages, to enforce specifically the terms and provisions of this Subscription Agreement, this being in addition to any other remedy to which such party is entitled at law, in equity, in contract, in tort or otherwise.

l. If any change in the number, type or classes of authorized shares of SOAC (including the Shares), other than as contemplated by the Transaction Agreement or any agreement contemplated by the Transaction Agreement, shall occur between the date hereof and immediately prior to the Closing by reason of reclassification, recapitalization, stock split (including reverse stock split) or combination, exchange or readjustment of shares, or any stock dividend, the number of Shares issued to the Investor shall be appropriately adjusted to reflect such change.

m. This Subscription Agreement shall be governed by and construed in accordance with the laws of the State of New York (regardless of the laws that might otherwise govern under applicable principles of conflicts of laws thereof) as to all matters (including any action, suit, litigation, arbitration, mediation, claim, charge, complaint, inquiry, proceeding, hearing, audit, investigation or reviews by or before any governmental entity related hereto), including matters of validity, construction, effect, performance and remedies.

n. Each party hereto, and any person asserting rights as a third party beneficiary may do so only if he, she or it, irrevocably agrees that any action, suit or proceeding between or among the parties hereto, whether arising in contract, tort or otherwise, arising in connection with any disagreement, dispute, controversy or claim arising out of or relating to this Subscription Agreement or any related document or any of the transactions contemplated hereby or thereby ("Legal Dispute") shall be brought only to the exclusive jurisdiction of the courts of the State of New York or the federal courts located in the State of New York, and each party hereto hereby consents to the jurisdiction of such courts (and of the appropriate appellate courts therefrom) in any such suit, action or proceeding and irrevocably waives, to the fullest extent permitted by law, any objection that it may now or hereafter have to the laying of the venue of any such suit, action or proceeding in any such court or that any such suit, action or proceeding that is brought in any such court has been brought in an inconvenient forum. During the period a Legal Dispute that is filed in accordance with this Section 11.n is pending before a court, all actions, suits or proceedings with respect to such Legal Dispute or any other Legal Dispute, including any counterclaim, cross-claim or interpleader, shall be subject to the exclusive jurisdiction of such court. Each party hereto and any person asserting rights as a third party beneficiary may do so only if he, she or it hereby waives, and shall not assert as a defense in any Legal Dispute, that (a) such party is not personally subject to the jurisdiction of the above named courts for any reason, (b) such action, suit or proceeding may not be brought or is not maintainable in such court, (c) such party's property is exempt or immune from execution, (d) such action, suit or proceeding is brought in an inconvenient forum, or (e) the venue of such action, suit or proceeding is improper. A final judgment in any action, suit or proceeding described in this Section 11.n following the expiration of any period permitted for appeal and subject to any stay during appeal shall be conclusive and may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by applicable laws. EACH OF THE PARTIES HERETO AND ANY PERSON ASSERTING RIGHTS AS A THIRD PARTY BENEFICIARY MAY DO SO ONLY IF HE, SHE OR IT IRREVOCABLY AND UNCONDITIONALLY WAIVES ANY RIGHT TO TRIAL BY JURY ON ANY CLAIMS OR COUNTERCLAIMS ASSERTED IN ANY LEGAL DISPUTE RELATING TO THIS SUBSCRIPTION AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY AND FOR ANY COUNTERCLAIM RELATING THERETO. IF THE SUBJECT MATTER OF ANY SUCH LEGAL DISPUTE IS ONE IN WHICH THE WAIVER OF JURY TRIAL IS PROHIBITED, NO PARTY HERETO NOR ANY PERSON ASSERTING RIGHTS AS A THIRD PARTY BENEFICIARY SHALL ASSERT IN SUCH LEGAL DISPUTE A NONCOMPULSORY COUNTERCLAIM ARISING OUT OF OR RELATING TO THIS SUBSCRIPTION AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY. FURTHERMORE, NO PARTY HERETO NOR ANY PERSON ASSERTING RIGHTS AS A THIRD PARTY BENEFICIARY SHALL SEEK TO CONSOLIDATE ANY SUCH LEGAL DISPUTE WITH A SEPARATE ACTION OR OTHER LEGAL PROCEEDING IN WHICH A JURY TRIAL CANNOT BE WAIVED.

o. Any notice or communication required or permitted hereunder to be given to the Investor shall be in writing and either delivered personally, emailed or sent by overnight mail via a reputable overnight carrier, or sent by certified or registered mail, postage prepaid, to such address(es) or email address(es) set forth on the signature page hereto, and shall be deemed to be given and received (i) when so delivered personally, (ii) when sent, with no mail undeliverable or other rejection notice, if sent by email, or (iii) three (3) business days after the date of mailing to the address below or to such other address or addresses as the Investor may hereafter designate by notice to SOAC.

12. Non-Reliance and Exculpation. The Investor acknowledges that it is not relying upon, and has not relied upon, any statement, representation or warranty made by any person, firm or corporation (including, without limitation, the Placement Agents, any of their respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing), other than the statements, representations

and warranties of SOAC expressly contained in Section 6 of this Subscription Agreement, in making its investment or decision to invest in SOAC. The Investor acknowledges and agrees that none of (i) any other investor pursuant to this Subscription Agreement or any other subscription agreement related to the private placement of the Shares (including the investor's respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing), (ii) the Placement Agents, their respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing, or (iii) any other party to the Transaction Agreement or any Non-Party Affiliate (other than SOAC with respect to the previous sentence), shall have any liability to the Investor, or to any other investor, pursuant to, arising out of or relating to this Subscription Agreement or any other subscription agreement related to the private placement of the Shares, the negotiation hereof or thereof or its subject matter, or the transactions contemplated hereby or thereby, including, without limitation, with respect to any action heretofore or hereafter taken or omitted to be taken by any of them in connection with the purchase of the Shares or with respect to any claim (whether in tort, contract or otherwise) for breach of this Subscription Agreement or in respect of any written or oral representations made or alleged to be made in connection herewith, as expressly provided herein, or for any actual or alleged inaccuracies, misstatements or omissions with respect to any information or materials of any kind furnished by SOAC, the Company, the Placement Agents or any Non-Party Affiliate concerning SOAC, the Company, the Placement Agents, any of their controlled affiliates, this Subscription Agreement or the transactions contemplated hereby. For purposes of this Subscription Agreement, "Non-Party Affiliates" means each former, current or future officer, director, employee, partner, member, manager, direct or indirect equityholder or affiliate of SOAC, the Company, any Placement Agent or any of SOAC's, the Company's or any Placement Agent's controlled affiliates or any family member of the foregoing.

13. Disclosure. SOAC shall, by 9:00 a.m., New York City time, on the first (1st) business day immediately following the date of this Subscription Agreement, issue one or more press releases or file with the SEC a Current Report on Form 8-K (collectively, the "Disclosure Document") disclosing all material terms of the transactions contemplated hereby and by the Other Subscription Agreements, the Transaction and any other material, nonpublic information that SOAC has provided to the Investor at any time prior to the filing of the Disclosure Document. Upon the issuance of the Disclosure Document, to the actual knowledge of SOAC, the Investor shall not be in possession of any material, non-public information received from SOAC or any of its officers, directors, or employees or agents, and the Investor shall no longer be subject to any confidentiality or similar obligations under any current agreement, whether written or oral, with SOAC or any of its affiliates, relating to the transactions contemplated by this Subscription Agreement. Notwithstanding anything in this Subscription Agreement to the contrary, SOAC shall not publicly disclose the name of the Investor or any of its affiliates or advisers, or include the name of the Investor or any of its affiliates or advisers in any press release or in any filing with the SEC or any regulatory agency or trading market, without the prior written consent of the Investor, except (i) as required by the federal securities law or pursuant to other routine proceedings of regulatory authorities, (ii) to the extent such disclosure is required by law, at the request of the staff of the SEC or regulatory agency or under the regulations of any national securities exchange on which SOAC's securities are listed for trading or (iii) to the extent such announcements or other communications contain only information previously disclosed in a public statement, press release or other communication previously approved in accordance with this Section 13.

[*SIGNATURE PAGES FOLLOW*]

IN WITNESS WHEREOF, the Investor has executed or caused this Subscription Agreement to be executed by its duly authorized representative as of the date set forth below.

Name of Investor:	State/Country of Formation or Domicile:
By: _____	
Name: _____	
Title: _____	
Name in which Shares are to be registered (if different):	Date: _____, 2021
Investor's EIN:	
Business Address-Street:	Mailing Address-Street (if different):
City, State, Zip:	City, State, Zip:
Attn: _____	Attn: _____
Telephone No.:	Telephone No.:
Facsimile No.:	Facsimile No.:
Number of Shares subscribed for:	
Aggregate Subscription Amount: $	Price Per Share: $10.00

You must pay the Subscription Amount by wire transfer of United States dollars in immediately available funds to the account specified by SOAC in the Closing Notice.

IN WITNESS WHEREOF, SOAC has accepted this Subscription Agreement as of the date set forth below.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

By: _____

Name:

Title:

Date:

date above written

SCHEDULE A

ELIGIBILITY REPRESENTATIONS OF THE INVESTOR

A. QUALIFIED INSTITUTIONAL BUYER STATUS

(Please check the applicable subparagraphs):

£ We are a "qualified institutional buyer" (as defined in Rule 144A under the Securities Act (a "QIB")).

B. INSTITUTIONAL ACCREDITED INVESTOR STATUS

(Please check the applicable subparagraphs):

1. ☐ We are an "accredited investor" (within the meaning of Rule 501(a) under the Securities Act or an entity in which all of the equity holders are accredited investors within the meaning of Rule 501(a) under the Securities Act), and have marked and initialed the appropriate box on the following page indicating the provision under which we qualify as an "accredited investor."

2. ☐ We are not a natural person.

Rule 501(a), in relevant part, states that an "accredited investor" shall mean any person who comes within any of the below listed categories, or who the issuer reasonably believes comes within any of the below listed categories, at the time of the sale of the securities to that person. The Investor has indicated, by marking and initialing the appropriate box below, the provision(s) below which apply to the Investor and under which the Investor accordingly qualifies as an "accredited investor."

☐ Any bank, registered broker or dealer, insurance company, registered investment company, business development company, or small business investment company;

☐ Any plan established and maintained by a state, its political subdivisions, or any agency or instrumentality of a state or its political subdivisions for the benefit of its employees, if such plan has total assets in excess of $5,000,000;

☐ Any employee benefit plan, within the meaning of the Employee Retirement Income Security Act of 1974, if a bank, insurance company, or registered investment adviser makes the investment decisions, or if the plan has total assets in excess of $5,000,000;

☐ Any organization described in Section 501(c)(3) of the Internal Revenue Code, corporation, similar business trust, limited liability company, or partnership, not formed for the specific purpose of acquiring the securities offered, with total assets in excess of $5,000,000;

☐ Any trust with assets in excess of $5,000,000, not formed to acquire the securities offered, whose purchase is directed by a sophisticated person; or

☐ Any entity in which all of the equity owners are accredited investors.

This page should be completed by the Investor
and constitutes a part of the Subscription Agreement.

SCHEDULE B

ELIGIBILITY REPRESENTATIONS OF CANADIAN INVESTOR
ACCREDITED INVESTOR CERTIFICATE

This Schedule must be completed by the Investor and forms a part of the Subscription Agreement to which it is attached. All defined terms not specifically defined in this Certificate of Accredited Investor are defined in Canadian Securities Laws.

(Check one or more, as applicable):

_____ (a) (i) except in Ontario, a Canadian financial institution, or a Schedule III bank; or

_____ (ii) in Ontario, a financial institution described in paragraph 73.1(1) of the *Securities Act* (Ontario) (as detailed below),

_____ (b) the Business Development Bank of Canada incorporated under the *Business Development Bank of Canada Act* (Canada),

_____ (c) a subsidiary of any person or company referred to in paragraphs (a) or (b), if the person or company owns all of the voting securities of the subsidiary, except the voting securities required by law to be owned by directors of that subsidiary,

_____ (d) a person registered under the securities legislation of a province or territory of Canada as an adviser or dealer, and in Ontario except as otherwise prescribed by applicable regulations,

_____ (e) an individual registered under the securities legislation of a province or territory of Canada as a representative of a person referred to in paragraph (d),

_____ (e.1) an individual formerly registered under the securities legislation of a province or territory of Canada, other than an individual formerly registered solely as a representative of a limited market dealer under one or both of the *Securities Act* (Ontario) or the *Securities Act* (Newfoundland and Labrador),

_____ (f) the Government of Canada or the government of a province or territory of Canada, or any crown corporation, agency or wholly owned entity of the Government of Canada or the government of a province or territory of Canada,

_____ (g) a municipality, public board or commission in Canada and a metropolitan community, school board, the Comité de gestion de la taxe scolaire de l'île de Montréal or an intermunicipal management board in Québec,

_____ (h) any national, federal, state, provincial, territorial or municipal government of or in any foreign jurisdiction, or any agency of that government,

_____ (i) a pension fund that is regulated by either the Office of the Superintendent of Financial Institutions (Canada) or a pension commission or similar regulatory authority of a province or territory of Canada,

(j) [*Intentionally deleted.*]

_____ (j.1) an individual who beneficially owns financial assets having an aggregate realizable value that, before taxes but net of any related liabilities, exceeds CAD$5,000,000,

(k) [*Intentionally deleted.*]

(l) [*Intentionally deleted.*]

(m) a person, other than an individual or investment fund, that has net assets of at least CAD$5,000,000, as shown on its most recently prepared financial statements, and that was not formed for the sole purpose of making a representation to this effect in order to qualify as an accredited investor, (*Note: your "net income" before taxes is found on your personal income tax return.*)

_____ (n) an investment fund that distributes or has distributed its securities only to

(i) a person that is or was an accredited investor at the time of the distribution,

(ii) a person that acquires or acquired securities in the circumstances referred to in Sections 2.10 [*Minimum amount investment*] or 2.19 [*Additional investment in investment funds*] of NI 45-106 or equivalent exemptions under applicable securities legislation as specified in Section 8.2 of NI 45-106, or

(iii) a person described in paragraph (i) or (ii) that acquires or acquired securities under Section 2.18 [*Investment fund reinvestment*] of NI 45-106,

_____ (o) an investment fund that distributes or has distributed securities under a prospectus in a province of Canada for which the regulator or, in Quebec, the securities regulatory authority, has issued a receipt,

_____ (p) a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a province or territory of Canada or a foreign jurisdiction, acting on behalf of a fully managed account managed by the trust company or trust corporation, as the case may be,

_____ (q) a person acting on behalf of a fully managed account managed by that person, if that person is registered or authorized to carry on business as an adviser or the equivalent under the securities legislation of a province or territory of Canada or a foreign jurisdiction,

_____ (r) a registered charity under the *Income Tax Act* (Canada) that, in regard to the trade, has obtained advice from an eligibility adviser or an adviser registered under the securities legislation of the province or territory of the registered charity to give advice on the securities being traded,

_____ (s) an entity organized in a foreign jurisdiction that is analogous to any of the entities referred to in paragraphs (a) to (d) or paragraph (i) in form and function,

_____ (t) a person in respect of which all of the owners of interests, direct, indirect or beneficial, except the voting securities required by law to be owned by directors, are persons that are accredited investors. ***If you checked (t), please indicate the name and category of accredited investor (by reference to the applicable letter in this Appendix "A") of each of:***

	Name:	**Category of Accredited Investor**
Owner:		
Owner:		
Owner:		

[attach sheet if more than 3 owners]

(u) an investment fund that is advised by a person registered as an adviser or a person that is exempt from registration as an adviser,

_____ (v) a person that is recognized or designated by the securities regulatory authority or, except in Ontario and Québec, the regulator as an accredited investor, or

(w) a trust established by an accredited investor for the benefit of the accredited investor's family members of which a majority of the trustees are accredited investors and all of the beneficiaries are the accredited investor's spouse, a former spouse of the accredited investor or a parent, grandparent, brother, sister, child or grandchild of that accredited investor, of that accredited investor's spouse or of that accredited investor's former spouse. ***If you checked (w), please indicate the name and category of accredited investor (by reference to the applicable letter in this Appendix "A" of each of:***

	Name:	**Category of Accredited Investor**
Individual who established trust:		
Trustee:		
Trustee:		
Trustee:		

[attach sheet if more than 3 trustees]

SCHEDULE C

ELIGIBILITY REPRESENTATIONS OF CANADIAN INVESTOR
PERMITTED CLIENT CERTIFICATE

This Schedule must be completed by the Investor and forms a part of the Subscription Agreement to which it is attached. All defined terms not specifically defined in this Certificate of Permitted Client are defined in Canadian Securities Law.

(Check one or more, as applicable):

☐ (a) a Canadian financial institution or a Schedule III bank;

☐ (b) the Business Development Bank of Canada incorporated under the *Business Development Bank of Canada Act* (Canada);

☐ (c) a subsidiary of any person or company referred to in paragraph (a) or (b), if the person or company owns all of the voting securities of the subsidiary, except the voting securities required by law to be owned by directors of the subsidiary;

☐ (d) a person or company registered under the securities legislation of a jurisdiction of Canada as an adviser, investment dealer, mutual fund dealer or exempt market dealer;

☐ (e) a pension fund that is regulated by either the federal Office of the Superintendent of Financial Institutions or a pension commission or similar regulatory authority of a jurisdiction of Canada or a wholly-owned subsidiary of such a pension fund;

☐ (f) an entity organized in a foreign jurisdiction that is analogous to any of the entities referred to in paragraphs (a) to (e);

☐ (g) the Government of Canada or a jurisdiction of Canada, or any Crown corporation, agency or wholly-owned entity of the Government of Canada or a jurisdiction of Canada;

☐ (h) any national, federal, state, provincial, territorial or municipal government of or in any foreign jurisdiction, or any agency of that government;

☐ (i) a municipality, public board or commission in Canada and a metropolitan community, school board, the *Comité de gestion de la taxe scolaire de l'île de Montréal* or an intermunicipal management board in Québec;

☐ (j) a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a jurisdiction of Canada or a foreign jurisdiction, acting on behalf of a managed account managed by the trust company or trust corporation, as the case may be;

☐ (k) a person or company acting on behalf of a managed account managed by the person or company, if the person or company is registered or authorized to carry on business as an adviser or the equivalent under the securities legislation of a jurisdiction of Canada or a foreign jurisdiction;

☐ (l) an investment fund if one or both of the following apply:

(i) the fund is managed by a person or company registered as an investment fund manager under the securities legislation of a jurisdiction of Canada;

(ii) the fund is advised by a person or company authorized to act as an adviser under the securities legislation of a jurisdiction of Canada;

☐ (m) in respect of a dealer, a registered charity under the *Income Tax Act* (Canada) that obtains advice on the securities to be traded from an eligibility adviser, as defined in section 1.1 of National Instrument 45-106 *Prospectus and Registration Exemptions*, or an adviser registered under the securities legislation of the jurisdiction of the registered charity;

☐ (n) in respect of an adviser, a registered charity under the *Income Tax Act* (Canada) that is advised by an eligibility adviser, as defined in section 1.1 of National Instrument 45-106 *Prospectus and Registration Exemptions*, or an adviser registered under the securities legislation of the jurisdiction of the registered charity;

☐ (o) an individual who beneficially owns financial assets, as defined in section 1.1 of National Instrument 45-106 *Prospectus and Registration Exemptions*, having an aggregate realizable value that, before taxes but net of any related liabilities, exceeds C$5 million;

☐ (p) a person or company that is entirely owned by an individual or individuals referred to in paragraph (o), who holds the beneficial ownership interest in the person or company directly or through a trust, the trustee of which is a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a jurisdiction of Canada or a foreign jurisdiction;

☐ (q) a person or company, other than an individual or an investment fund, that has net assets of at least C$25 million as shown on its most recently prepared financial statements;

☐ (r) a person or company that distributes securities of its own issue in Canada only to persons or companies referred to in paragraphs (a) to (q) above.

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SCHEDULE D

CONTACT INFORMATION – CANADIAN PROVINCIAL AND TERRITORIAL SECURITIES REGULATORY AUTHORITIES

The contact information of the public official in the local jurisdiction who can answer questions about the security regulatory authority's or regulator's indirect collection of information is as follows:

Alberta Securities Commission
Suite 600, 250 – 5th Street SW
Calgary, Alberta T2P 0R4
Telephone: (403) 297-6454
Toll free in Canada: 1-877-355-0585
Facsimile: (403) 297-2082

British Columbia Securities Commission
P.O. Box 10142, Pacific Centre
701 West Georgia Street
Vancouver, British Columbia V7Y 1L2
Inquiries: (604) 899-6854
Toll free in Canada: 1-800-373-6393
Facsimile: (604) 899-6581
Email: inquiries@bcsc.bc.ca

The Manitoba Securities Commission
500 – 400 St. Mary Avenue
Winnipeg, Manitoba R3C 4K5
Telephone: (204) 945-2548
Toll free in Manitoba 1-800-655-5244
Facsimile: (204) 945-0330

Financial and Consumer Services Commission (New Brunswick)
85 Charlotte Street, Suite 300
Saint John, New Brunswick E2L 2J2
Telephone: (506) 658-3060
Toll free in Canada: 1-866-933-2222
Facsimile: (506) 658-3059
Email: info@fcnb.ca

Government of Newfoundland and Labrador
Financial Services Regulation Division
P.O. Box 8700
Confederation Building
2nd Floor, West Block
Prince Philip Drive
St. John's, Newfoundland and Labrador A1B 4J6
Attention: Director of Securities

Government of the Northwest Territories
Office of the Superintendent of Securities
P.O. Box 1320
Yellowknife, Northwest Territories X1A 2L9
Attention: Deputy Superintendent, Legal & Enforcement
Telephone: (867) 920-8984
Facsimile: (867) 873-0243

Nova Scotia Securities Commission
Suite 400, 5251 Duke Street
Duke Tower
P.O. Box 458
Halifax, Nova Scotia B3J 2P8
Telephone: (902) 424-7768
Facsimile: (902) 424-4625

Government of Nunavut
Department of Justice
Legal Registries Division
P.O. Box 1000, Station 570
1st Floor, Brown Building
Iqaluit, Nunavut X0A 0H0
Telephone: (867) 975-6590
Facsimile: (867) 975-6594

Ontario Securities Commission
20 Queen Street West, 22nd Floor
Toronto, Ontario M5H 3S8
Telephone: (416) 593- 8314
Toll free in Canada: 1-877-785-1555
Facsimile: (416) 593-8122
Email: exemptmarketfilings@osc.gov.on.ca
Public official contact regarding indirect collection of information: Inquiries Officer

Prince Edward Island Securities Office
95 Rochford Street, 4th Floor Shaw Building
P.O. Box 2000
Charlottetown, Prince Edward Island C1A 7N8
Telephone: (902) 368-4569
Facsimile: (902) 368-5283

Financial and Consumer Affairs Authority of Saskatchewan
Suite 601 - 1919 Saskatchewan Drive

Telephone: (709) 729-4189

Facsimile: (709) 729-6187

Regina, Saskatchewan S4P 4H2

Telephone: (306) 787-5879

Facsimile: (306) 787-5899

Autorité des marchés financiers

800, Square Victoria, 22e étage

C.P. 246, Tour de la Bourse

Montréal, Québec H4Z 1G3

Telephone: (514) 395-0337 or 1-877-525-0337

Facsimile: (514) 873-6155 (For filing purposes only)

Facsimile: (514) 864-6381 (For privacy requests only)

Email: financementdessocietes@lautorite.qc.ca

(For corporate finance issuers);

Email: fonds_dinvestissement@lautorite.qc.ca

(For investment fund issuers)

Office of the Superintendent of Securities

Government of Yukon

Department of Community Services

307 Black Street, 1st floor

Box 2703, C-6

Whitehorse, Yukon Y1A 2C6

Telephone: (867) 667-5466

Facsimile: (867) 393-6251

Email: Securities@gov.yk.ca

ANNEX E-2

INDIVIDUAL INVESTOR FORM OF SUBSCRIPTION AGREEMENT

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Ladies and Gentlemen:

This Subscription Agreement (this "Subscription Agreement") is being entered into as of the date set forth on the signature page hereto, by and between Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company, which shall migrate and be continued from the Cayman Islands to British Columbia, Canada and continued as a company in British Columbia prior to the closing of the Transaction (as defined herein) ("SOAC"), and the undersigned subscriber (the "Investor"), in connection with the Business Combination Agreement, dated as of the date hereof (as may be amended, supplemented or otherwise modified from time to time, the "Transaction Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada, and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada (the "Company"), and the other parties thereto, pursuant to which, among other things, SOAC will acquire all of the issued and outstanding shares in the capital of the Company in exchange for common shares of SOAC, and the Company will become a wholly-owned subsidiary of SOAC, upon and subject to the plan of arrangement and other terms and conditions set forth in the Transaction Agreement (the "Transaction").

In connection with the Transaction, SOAC is seeking commitments from interested investors to purchase, contingent upon, and substantially concurrently with the closing of the Transaction, SOAC's common shares (the "Shares"), in a private placement for a purchase price of $10.00 per Share (the "Per Share Purchase Price"). On or about the date of this Subscription Agreement, SOAC is entering into subscription agreements (the "Other Subscription Agreements," and together with this Subscription Agreement, the "Subscription Agreements") with certain other investors (the "Other Investors," and together with the Investor, severally and not jointly, the "Investors"), pursuant to which the Investors have agreed to purchase on the closing date of the Transaction, inclusive of the Shares subscribed for by the Investor under this Subscription Agreement, an aggregate amount of up to 33,030,000 Shares, at the Per Share Purchase Price.

The aggregate purchase price to be paid by the Investor for the subscribed Shares (as set forth on the signature page hereto) is referred to herein as the "Subscription Amount."

In connection therewith, and in consideration of the foregoing and the mutual representations, warranties and covenants, and subject to the conditions, set forth herein, and intending to be legally bound hereby, each of the Investor and SOAC acknowledges and agrees as follows:

1. Subscription. The Investor hereby irrevocably subscribes for and agrees to purchase from SOAC, and SOAC agrees to issue and sell to the Investor, the number of Shares set forth on the signature page of this Subscription Agreement on the terms and subject to the conditions provided for herein. The Investor acknowledges and agrees that SOAC reserves the right to accept or reject the Investor's subscription for the Shares for any reason or for no reason, in whole or in part, at any time prior to its acceptance, and the same shall be deemed to be accepted by SOAC only when this Subscription Agreement is signed by a duly authorized person by or on behalf of SOAC; SOAC may do so in counterpart form.

2. Closing. The closing of the sale of the Shares contemplated hereby (the "Closing") is contingent upon the substantially concurrent consummation of the Transaction. The Closing shall occur on the date of, and substantially concurrently with and conditioned upon the effectiveness of, the Transaction. Upon (a) satisfaction or waiver of the conditions set forth in Section 4 below and (b) delivery of written notice from (or on behalf of) SOAC to the Investor (the "Closing Notice") that SOAC reasonably expects all conditions to the closing of the Transaction to be satisfied or waived on a date that is not less than five (5) business days from the date on which the Closing Notice is delivered to the Investor, the Investor shall deliver to SOAC, one (1) business day prior to the closing date specified in the Closing Notice (the "Closing Date"), (i) the Subscription Amount by wire transfer of United States dollars in immediately available funds to the account(s) specified by SOAC in the Closing Notice and (ii) any other information that is reasonably requested in the Closing Notice in order for SOAC to issue the Investor's Shares, including, without limitation, the legal name of the person in whose name such Shares are to be issued and a duly

executed Internal Revenue Service Form W-9 or W-8, as applicable. On the Closing Date, SOAC shall issue a number of Shares to the Investor set forth on the signature page to this Subscription Agreement and subsequently cause such Shares to be registered in book entry form, free and clear of any liens or other restrictions whatsoever (other than those arising under state, provincial or federal securities laws or under the organizational documents of SOAC) in the name of the Investor (or its, his or her nominee in accordance with the Investor's instructions) or to a custodian designated by the Investor, as applicable, on SOAC's share register; provided, however, that SOAC's obligation to issue the Shares to the Investor is contingent upon SOAC having received the Subscription Amount in full accordance with this Section 2. If the Closing does not occur within five (5) business days following the Closing Date specified in the Closing Notice, SOAC shall promptly (but not later than one (1) business day thereafter) return the Subscription Amount in full to the Investor; provided, that unless this Subscription Agreement has been terminated pursuant to Section 9 hereof, such return of funds shall not terminate this Subscription Agreement or relieve the Investor of its, his or her obligations to purchase the Shares at the Closing in the event SOAC delivers a subsequent Closing Notice in connection with this Section 2. For purposes of this Subscription Agreement, "business day" shall mean a day other than a Saturday, Sunday or other day on which the principal offices of the Securities Exchange Commission in Washington, D.C. and of the British Columbia Securities Commission do not accept filings, or, in the case of determining a date when any payment is due, any day on which the commercial banks in New York, New York or Vancouver, British Columbia are authorized or required by law to close.

3. Legends. Each book entry for the Investor's Shares shall contain a notation, and each certificate (if any) evidencing the Investor's Shares shall be stamped or otherwise imprinted with a legend, in substantially the following form, and in the event that no physical certificates are issued, the below constitutes written notice of the legend restriction under applicable Canadian Securities Laws (as defined below):

> THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED, OR THE SECURITIES LAWS OF ANY STATE OR OTHER JURISDICTION, AND NEITHER THE SECURITIES NOR ANY INTEREST THEREIN MAY BE OFFERED, SOLD, TRANSFERRED, PLEDGED OR OTHERWISE DISPOSED OF EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER SUCH ACT OR SUCH LAWS OR AN EXEMPTION FROM REGISTRATION UNDER SUCH ACT AND SUCH LAWS WHICH, IN THE OPINION OF COUNSEL, IS AVAILABLE.
>
> UNLESS PERMITTED UNDER CANADIAN SECURITIES LEGISLATION, THE HOLDER OF THIS SECURITY MUST NOT TRADE THE SECURITY BEFORE THE DATE THAT IS 4 MONTHS AND A DAY AFTER THE LATER OF: (i) THE DISTRIBUTION DATE, AND (ii) THE DATE THE ISSUER BECAME A REPORTING ISSUER IN ANY PROVINCE OR TERRITORY OF CANADA.

4. Closing Conditions.

a. The obligation of the parties hereto to consummate the purchase and sale of the Shares pursuant to this Subscription Agreement is subject to the following conditions:

> (i) no applicable governmental authority shall have enacted, issued, promulgated, enforced or entered any judgment, order, law, rule or regulation (whether temporary, preliminary or permanent) which is then in effect and has the effect of making the consummation of the transactions contemplated hereby illegal or otherwise restraining or prohibiting consummation of the transactions contemplated hereby, and no governmental authority shall have instituted a proceeding seeking to impose any such prevention or prohibition; and
>
> (ii) all conditions precedent to the closing of the Transaction under the Transaction Agreement shall have been satisfied or waived (as determined by the parties to the Transaction Agreement and other than those conditions under the Transaction Agreement which, by their nature, are to be fulfilled at the closing of the Transaction, including to the extent that any such condition is dependent upon the consummation of the purchase and sale of the Shares pursuant to this Subscription Agreement) and the closing of the Transaction shall be scheduled to occur concurrently with or on the same date as the Closing Date.

b. The obligation of SOAC to consummate the issuance and sale of the Shares pursuant to this Subscription Agreement shall be subject to the conditions that (i) all representations and warranties of the Investor contained in this Subscription Agreement are true and correct in all material respects at and as of the Closing Date (unless they specifically speak as of an earlier date in which case they shall be true and correct in all material respects as of such date), and the Investor hereby acknowledges that the consummation of the Closing shall constitute a reaffirmation by the Investor of each of the representations and warranties of the Investor contained in this Subscription Agreement as of the Closing Date and (ii) all obligations, covenants and agreements of the Investor required to be performed by it, him or her at or prior to the Closing Date shall have been performed in all material respects.

c. The obligation of the Investor to consummate the purchase of the Shares pursuant to this Subscription Agreement shall be subject to the following conditions: (i) all representations and warranties of SOAC contained in this Subscription Agreement shall be true and correct in all material respects (other than representations and warranties that are qualified as to materiality or Material Adverse Effect (as defined herein), which representations and warranties shall be true in all respects) at and as of the Closing Date (unless they specifically speak as of an earlier date in which case they shall be true and correct in all material respects as of such date), and SOAC hereby acknowledges that the consummation of the Closing shall constitute a reaffirmation by SOAC of each of the representations and warranties of SOAC contained in this Subscription Agreement as of the Closing Date and (ii) all obligations, covenants and agreements of SOAC required by the Subscription Agreement to be performed by it at or prior to the Closing Date shall have been performed in all material respects.

5. Further Assurances. At or prior to the Closing Date, each of SOAC, the Company and the Investor shall execute and deliver such additional documents and take such additional actions as the parties reasonably may deem to be practical and necessary in order to consummate the subscription as contemplated by this Subscription Agreement. Prior to or at the Closing, the Investor shall deliver to SOAC a duly completed and executed Internal Revenue Service Form W-9 or appropriate Form W-8, as applicable.

6. SOAC Representations and Warranties. For purposes of this Section 5, the term "SOAC" shall refer to SOAC as of the date hereof and, for purposes of only the representations contained in paragraphs (h), (i), and (j) of this Section 6 and to the extent such representations and warranties are made as of the date of the closing of the Transaction, the combined company after giving effect to the Transaction. SOAC represents and warrants to the Investor that:

a. SOAC is an exempted company duly incorporated, validly existing and in good standing under the laws of the Cayman Islands. SOAC has all power (corporate or otherwise) and authority to own, lease and operate its properties and conduct its business as presently conducted and to enter into, deliver and perform its obligations under this Subscription Agreement. As of the Closing Date, SOAC will be duly incorporated, validly existing as a corporation and in good standing under the laws of British Columbia, Canada.

b. As of the Closing Date, the Shares will be duly authorized and, when issued and delivered to the Investor against full payment therefor in accordance with the terms of this Subscription Agreement, the Shares will be validly issued, fully paid and non-assessable and will not have been issued in violation of or subject to any preemptive or similar rights created under SOAC's certificate of incorporation (as adopted on the Closing Date) or under the *Business Corporations Act* (British Columbia).

c. This Subscription Agreement has been duly authorized, executed and delivered by SOAC and, assuming that this Subscription Agreement constitutes the valid and binding agreement of the Investor, this Subscription Agreement is enforceable against SOAC in accordance with its terms, except as may be limited or otherwise affected by (i) bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium or other laws relating to or affecting the rights of creditors generally, or (ii) principles of equity, whether considered at law or equity.

d. The execution, delivery and performance of the transaction contemplated by this Agreement, including issuance and sale of the Shares, and the compliance by SOAC with all of the provisions of this Subscription Agreement and the consummation of the transactions contemplated by this Subscription Agreement will (x) be substantially done in accordance with the rules of The New York Stock Exchange (the "NYSE") and (y) will not conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under, or result in the creation or imposition of any lien, charge or encumbrance upon any of the property or assets of SOAC

or any of its subsidiaries pursuant to the terms of (i) any indenture, mortgage, deed of trust, loan agreement, lease, license or other agreement or instrument to which SOAC or any of its subsidiaries is a party or by which SOAC or any of its subsidiaries is bound or to which any of the property or assets of SOAC is subject that would reasonably be expected to have a material adverse effect on the business, properties, assets, prospects, liabilities, financial condition or results of operations of SOAC and its subsidiaries, taken as a whole (a "Material Adverse Effect") or materially affect the validity of the Shares or the legal authority of SOAC to timely comply in all material respects with the terms of this Subscription Agreement; (ii) result in any violation of the provisions of the organizational documents of SOAC; or (iii) result in any violation of any statute or any judgment, order, rule or regulation of any court or governmental agency or body, domestic or foreign, having jurisdiction over SOAC or any of its properties that would reasonably be expected to have a Material Adverse Effect or materially affect the validity of the Shares or the legal authority of SOAC to comply in all material respects with this Subscription Agreement.

e. As of their respective filing dates, all reports (the "SEC Reports") required to be filed by SOAC with the U.S. Securities and Exchange Commission (the "SEC") complied in all material respects with the applicable requirements of the Securities Act of 1933, as amended (the "Securities Act") and the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the rules and regulations of the SEC promulgated thereunder, and none of the SEC Reports, when filed, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The financial statements of SOAC included in the SEC Reports comply in all material respects with applicable accounting requirements and the rules and regulations of the SEC with respect thereto as in effect at the time of filing and fairly present in all material respects the financial position of SOAC as of and for the dates thereof and the results of operations and cash flows for the periods then ended, subject, in the case of unaudited statements, to normal, year-end audit adjustments. A copy of each SEC Report is available to the Investor via the SEC's EDGAR system. There are no outstanding or unresolved comments in comment letters received by SOAC from the staff of the Division of Corporation Finance of the SEC with respect to any of the SEC Reports.

f. Assuming the accuracy of the Investor's representations and warranties set forth in Section 7, no registration under the Securities Act or filing of a prospectus under applicable Canadian Securities Laws is required for the offer and sale of the Shares by SOAC to the Investor hereunder. The Shares (i) were not offered by any form of general solicitation or general advertising and (ii) are not being offered in a manner involving a public offering under, or in a distribution in violation of, the Securities Act, or any state securities laws or under any Canadian Securities Laws.

g. Except for placement fees payable to Citigroup Global Markets Inc., Nomura Securities International, Inc. and Fearnley Securities, Inc., in their capacity as placement agents for the offer and sale of the Shares, SOAC has not paid, and is not obligated to pay, any brokerage, finder's or other commission or similar fee in connection with its issuance and sale of the Shares, including, for the avoidance of doubt, any fee or commission payable to any stockholder or affiliate of SOAC.

h. SOAC is in compliance with all applicable law, except where such non-compliance would not have a Material Adverse Effect. SOAC has not received any written communication from a governmental entity that alleges that SOAC is not in compliance with or is in default or violation of any applicable law, except where such non-compliance, default or violation would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect.

i. Except for such matters as have not had and would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect, there is no (i) action, suit, claim or other proceeding, in each case by or before any governmental authority pending, or, to the knowledge of SOAC, threatened against SOAC or (ii) judgment, decree, injunction, ruling or order of any governmental entity or arbitrator outstanding against SOAC.

j. SOAC is not, and immediately after receipt of payment for the Shares will not be, an "investment company" within the meaning of the Investment Company Act of 1940, as amended.

k. SOAC is not in default or violation (and no event has occurred which, with notice or the lapse of time or both, would constitute a default or violation) of any term, condition or provision of (i) SOAC's charter documents, (ii) any loan or credit agreement, note, bond, mortgage, indenture, lease or other agreement, permit, franchise or license to which SOAC is now a party or by which SOAC's properties or assets are bound or (iii) any statute or

any judgment, order, rule or regulation of any court or governmental agency or body, domestic or foreign, having jurisdiction over SOAC or any of its properties, except, in the case of clauses (ii) and (iii), for defaults or violations that have not had and would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect.

l. Other than the Other Subscription Agreements, the Transaction Agreement and any other agreement contemplated by the Transaction Agreement, SOAC has not entered into any side letter or similar agreement with any Other Investor or any other investor in connection with such Other Investor's or investor's direct or indirect investment in SOAC (other than any side letter or similar agreement relating to the transfer to any investor of (i) securities of SOAC by existing securityholders of SOAC, which may be effectuated as a forfeiture to SOAC and reissuance, or (ii) securities to be issued to the direct or indirect securityholders of the Company pursuant to the Transaction Agreement). No Other Subscription Agreement includes terms and conditions that are materially more advantageous to any such Other Investor than the Investor hereunder, and such Other Subscription Agreements have not been amended or modified in any material respect following the date of this Subscription Agreement.

m. SOAC is not required to obtain any consent, waiver, authorization or order of, give any notice to, or make any filing or registration with, any court or other federal, state, local or other governmental authority, self-regulatory organization or other person in connection with the execution, delivery and performance by SOAC of this Subscription Agreement (including, without limitation, the issuance of the Shares), other than (i) filings with the SEC, (ii) filings required by applicable state securities laws, (iii) filings required by NYSE, or such other applicable stock exchange on which SOAC's common equity is then listed, and (iv) filings, the failure of which to obtain would not be reasonably likely to have, individually or in the aggregate, a Material Adverse Effect.

n. As of the date of this Subscription Agreement, the authorized capital stock of SOAC consists of 300,000,000 Class A ordinary shares, par value $0.0001 per share (the "Class A Shares"), 30,000,000 Class B ordinary shares, par value $0.0001 per share (the "Class B Shares"), and 1,000,000 preference shares, par value $0.0001 per share. As of the date of this Subscription Agreement, (i) 30,000,000 Class A Shares are issued and outstanding, (ii) 7,500,00 Class B Shares are issued and outstanding, (iii) 9,500,000 private placement warrants, and (iv) 15,000,000 public warrants are outstanding. All (i) issued and outstanding Class A Shares and Class B Shares have been duly authorized and validly issued, are fully paid and are non-assessable and are not subject to preemptive rights and (ii) outstanding warrants have been duly authorized and validly issued, are fully paid and are not subject to preemptive rights. Except as set forth above and pursuant to the Transaction Agreement and the other agreements and arrangements referred to therein or in the SEC Reports, as of the date hereof, there are no outstanding options, warrants or other rights to subscribe for, purchase or acquire from SOAC any Class A Shares, Class B Shares or other equity interests in SOAC, or securities convertible into or exchangeable or exercisable for such equity interests.

7. Investor Representations and Warranties. The Investor represents and warrants to, and covenants with, SOAC that:

a. If the Investor is, or is subscribing for the account or benefit of, a person in the United States or a U.S. Person (as defined in Rule 902(k) of Regulation S), the Investor or each of the funds managed by or affiliated with the Investor for which the Investor is acting as nominee, as applicable (i) is a "qualified institutional buyer" (as defined in Rule 144A under the Securities Act), or an "accredited investor" (within the meaning of Rule 501(a) under the Securities Act), in each case, satisfying the applicable requirements set forth on Schedule A, (ii) is acquiring the Shares only for his, her or its own account and not for the account of others, or if the Investor is subscribing for the Shares as a fiduciary or agent for one or more investor accounts, the Investor has full investment discretion with respect to each such account, and the full power and authority to make the acknowledgements, representations and agreements herein on behalf of each owner of each such account, and (iii) is not acquiring the Shares with a view to, or for offer or sale in connection with, any distribution thereof in violation of the Securities Act (and shall provide the requested information set forth on Schedule A). The Investor is not an entity formed for the specific purpose of acquiring the Shares and (i) is an "institutional account" as defined by FINRA Rule 4512(c) or (ii) the investment manager, fiduciary, or agent that has been delegated investment decision making authority for the Investor is an "institutional account" as defined by FINRA Rule 4512(c).

b. The Investor acknowledges and agrees that SOAC may complete additional financings in the future to develop its business and fund its ongoing development, and such future financings may have a dilutive effect on current securityholders of SOAC, including the Investor, but there is no assurance that such financing will be available, on reasonable terms or at all, and if not available, SOAC may be unable to fund its ongoing development.

c. The Investor acknowledges and agrees that the Shares are being offered in a transaction not involving any public offering within the meaning of the Securities Act and that the Shares have not been registered under the Securities Act. The Investor acknowledges and agrees that the Shares may not be offered, resold, transferred, pledged or otherwise disposed of by the Investor absent an effective registration statement under the Securities Act except (i) to SOAC or a subsidiary thereof, (ii) to non-U.S. persons pursuant to offers and sales that occur outside the United States within the meaning of Regulation S under the Securities Act or (iii) pursuant to another applicable exemption from the registration requirements of the Securities Act, and in each of clauses (i) and (iii) in accordance with any applicable securities laws of the states and other jurisdictions of the United States, and that any certificates representing the Shares shall contain the restrictive legend to such effect outlined in Section 3 hereof. The Investor acknowledges and agrees that the Shares will be subject to transfer restrictions and, as a result of these transfer restrictions, the Investor may not be able to readily offer, resell, transfer, pledge or otherwise dispose of the Shares and may be required to bear the financial risk of an investment in the Shares for an indefinite period of time. The Investor acknowledges and agrees that the Shares will not be eligible for offer, resale, transfer, pledge or disposition pursuant to Rule 144 promulgated under the Securities Act ("Rule 144") until at least one year from the Closing Date. The Investor acknowledges and agrees that it, he or she has been advised to consult legal counsel and tax and accounting advisors prior to making any offer, resale, transfer, pledge or disposition of any of the Shares.

d. The Investor acknowledges and agrees that the Investor is purchasing the Shares directly from SOAC. The Investor further acknowledges that there have been no representations, warranties, covenants and agreements made to the Investor by or on behalf of SOAC, the Company, any of their respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing or any other person or entity, expressly or by implication, other than those representations, warranties, covenants and agreements of SOAC expressly set forth in Section 6 of this Subscription Agreement.

e. The Investor acknowledges that no person has made any written or oral representations (i) that any person will resell or repurchase the Shares; (ii) that any person will refund the purchase price of the Shares; or (iii) as to the future price or value of the Shares.

f. The Investor's acquisition and holding of the Shares will not constitute or result in a non-exempt prohibited transaction under Section 406 of the Employee Retirement Income Security Act of 1974, as amended, Section 4975 of the Internal Revenue Code of 1986, as amended, or any applicable similar law.

g. The Investor is not, and is not acting on behalf of, (i) an "employee benefit plan" subject to Title I of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"), (ii) an individual retirement account or annuity or other "plan" that is subject to Section 4975 of the Internal Revenue Code of 1986, as amended (the "Code"), (iii) any entity or account that is deemed under the Department of Labor regulation codified at 29 C.F.R. § 2510.3-101, as modified by Section 3(42) of ERISA, to include "plan assets" of any "employee benefit plan" subject to ERISA or "plan" subject to Code §4975, or (iv) any other plan subject to non-U.S., state, local or other federal laws or regulations that are substantially similar to the foregoing provisions of ERISA or the Code.

h. The Investor acknowledges and agrees that the Investor has received such information as the Investor deems necessary in order to make an investment decision with respect to the Shares, including, with respect to SOAC, the Transaction and the business of the Company and its subsidiaries. Without limiting the generality of the foregoing, the Investor acknowledges that Investor has had the opportunity to review SOAC's filings with the SEC. The Investor acknowledges and agrees that the Investor and the Investor's professional advisor(s), if any, have had the full opportunity to ask such questions, receive such answers and obtain such information as the Investor and such Investor's professional advisor(s), if any, have deemed necessary to make an investment decision with respect to the Shares.

i. The Investor became aware of this offering of the Shares solely by means of direct contact between the Investor and SOAC, the Company or a representative of SOAC or the Company, and the Shares were offered to the Investor solely by direct contact between the Investor and SOAC, the Company or a representative of SOAC or the Company. The Investor did not become aware of this offering of the Shares, nor were the Shares offered to the Investor, by any other means. The Investor acknowledges that the Shares (i) were not offered by any form of general solicitation or general advertising and (ii) are not being offered in a manner involving a public offering under, or in a distribution in violation of, the Securities Act, or any state securities laws. The Investor acknowledges that it, he or she is not relying upon, and has not relied upon, any statement, representation or warranty made by any person, firm or corporation (including, without limitation, SOAC, the Company, any of their respective affiliates or any

control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing), other than the representations and warranties of SOAC contained in Section 6 of this Subscription Agreement, in making an investment or decision to invest in SOAC.

j. The Investor acknowledges that it, he or she is aware that there are substantial risks incident to the purchase and ownership of the Shares, including those set forth in SOAC's filings with the SEC. The Investor is a sophisticated investor, has such knowledge and experience in financial and business matters as to be capable of evaluating the merits and risks of an investment in the Shares, and the Investor has sought such accounting, legal and tax advice as the Investor has considered necessary to make an informed investment decision. The Investor (or the investment manager, fiduciary, or agent that has been delegated decision-making authority on behalf of Investor) has made its, his or her own assessment and has satisfied the Investor concerning relevant tax and other economic considerations relative to its, his or her purchase of the Shares and acknowledges that the Investor shall be responsible for any of the Investor's tax liabilities that may arise as a result of the transactions contemplated by this Subscription Agreement, and that SOAC has not provided any tax advice or any other representation or guarantee regarding the tax consequences of the transactions contemplated by this Subscription Agreement. The Investor is able to sustain a complete loss on its, his or her investment in the Shares, has no need for liquidity with respect to its, his or her investment in the Shares and has no reason to anticipate any change in circumstances, financial or otherwise, which may cause or require any sale or distribution of all or any part of the Shares.

k. Alone, or together with any professional advisor(s), the Investor has adequately analyzed and fully considered the risks of an investment in the Shares and determined that the Shares are a suitable investment for the Investor and that the Investor is able at this time and in the foreseeable future to bear the economic risk of a total loss of the Investor's investment in SOAC. The Investor acknowledges specifically that a possibility of total loss exists. In making its, his or her decision to purchase the Shares, the Investor has relied solely upon independent investigation made by the Investor.

l. [Reserved.]

m. [Reserved.]

n. [Reserved.]

o. The Investor acknowledges and agrees that no federal, provincial or state agency, securities commission or similar authority has reviewed, has passed upon or endorsed the merits of the offering of the Shares or made any findings or determination as to the fairness of this investment, and that any representation to the contrary is an offence.

p. The Investor, if not an individual, has been duly formed or incorporated and is validly existing and is in good standing under the laws of its jurisdiction of formation or incorporation, with power and authority to enter into, deliver and perform its obligations under this Subscription Agreement.

q. The execution, delivery and performance by the Investor of this Subscription Agreement are within the powers of the Investor, have been duly authorized and will not constitute or result in a breach or default under or conflict with any order, ruling or regulation of any court or other tribunal or of any governmental commission or agency, or any agreement or other undertaking, to which the Investor is a party or by which the Investor is bound, and, if the Investor is not an individual, will not violate any provisions of the Investor's organizational documents, including, without limitation, its incorporation or formation papers, bylaws, indenture of trust or partnership or operating agreement, as may be applicable. The signature on this Subscription Agreement is genuine, and the signatory, if the Investor is an individual, has legal competence and capacity to execute the same or, if the Investor is not an individual, the signatory has been duly authorized to execute the same, and, assuming that this Subscription Agreement constitutes the valid and binding obligation of SOAC, this Subscription Agreement constitutes a legal, valid and binding obligation of the Investor, enforceable against the Investor in accordance with its terms except as may be limited or otherwise affected by (i) bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium or other laws relating to or affecting the rights of creditors generally, and (ii) principles of equity, whether considered at law or equity.

r. The Investor is not (i) a person or entity named on the List of Specially Designated Nationals and Blocked Persons administered by the U.S. Treasury Department's Office of Foreign Assets Control ("OFAC") or in any Executive Order issued by the President of the United States and administered by OFAC ("OFAC List"), or a person or entity prohibited by any OFAC sanctions program, (ii) owned, directly or indirectly, or controlled by, or acting on behalf of, one or more persons that are named on the OFAC List; (iii) organized, incorporated, established, located, resident or born in, or a citizen, national or the government, including any political subdivision, agency or instrumentality thereof, of, Cuba, Iran, North Korea, Syria, the Crimea region of Ukraine or any other country or territory embargoed or subject to substantial trade restrictions by the United States, (iv) a Designated National as defined in the Cuban Assets Control Regulations, 31 C.F.R. Part 515, or (v) a non-U.S. shell bank or providing banking services indirectly to a non-U.S. shell bank (each, a "Prohibited Investor"). The Investor agrees to provide law enforcement agencies, if requested thereby, such records as required by applicable law, provided that the Investor is permitted to do so under applicable law. If the Investor is a financial institution subject to the Bank Secrecy Act (31 U.S.C. Section 5311 et seq.) (the "BSA"), as amended by the USA PATRIOT Act of 2001 (the "PATRIOT Act"), and its implementing regulations (collectively, the "BSA/PATRIOT Act"), the Investor maintains policies and procedures reasonably designed to comply with applicable obligations under the BSA/PATRIOT Act. To the extent required, the Investor maintains policies and procedures reasonably designed to ensure compliance with OFAC-administered sanctions programs, including for the screening of its investors against the OFAC sanctions programs, including the OFAC List. To the extent required by applicable law, the Investor maintains policies and procedures reasonably designed to ensure that the funds held by the Investor and used to purchase the Shares were legally derived and were not obtained, directly or indirectly, from a Prohibited Investor.

s. [Reserved.]

t. [Reserved.]

u. The Investor has or has commitments to have and, when required to deliver payment to SOAC pursuant to Section 2 above, will have, sufficient funds to pay the Subscription Amount and consummate the purchase and sale of the Shares pursuant to this Subscription Agreement.

v. The funds used to purchase the Shares which will be advanced by the Investor to SOAC hereunder will not represent proceeds of crime for the purposes of the *Criminal Code* (Canada) or the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act* (Canada) (collectively, "Anti-Money Laundering Laws") and the Investor acknowledges that SOAC may in the future be required by law to disclose the Investor's name and other information relating to this Subscription Agreement and the Investor's subscription hereunder, on a confidential basis, pursuant to the Anti-Money Laundering Laws and the legislation, regulations or instruments enacting Canadian Economic Sanctions (as defined below). The Investor is not a person or entity identified on a list established under any Anti-Money Laundering Law (including, without limitation, Section 83.05 of the Criminal Code (Canada)) and the Investor is not a person or entity identified in the legislation or regulations enacting any economic or financial sanctions, laws, regulations, embargoes, or restrictive measures imposed, administered or enforced by Canada, including but not limited to, the provisions of the *United Nations Act* (Canada), the *Special Economic Measures Act* (Canada) or any other economic sanctions laws administered by applicable Canadian regulatory authorities (collectively, "Canadian Economic Sanctions"). To the best of its, his or her knowledge, none of the subscription funds to be provided by the Investor: (i) have been or will be derived from or related to any activity that is deemed criminal under the laws of Canada, the United States, or any other jurisdiction; or (ii) are being tendered on behalf of a person or entity who has not been identified to the Investor, and the Investor will promptly notify SOAC if the Investor discovers that any of such representations cease to be true and provide SOAC with appropriate information in connection therewith; none of the funds the Investor is using to purchase the Shares are, to the knowledge of the Investor, proceeds obtained or delivered, directly or indirectly, as a result of illegal activities.

w. The Investor acknowledges and agrees that the sale and delivery of the Shares is conditional upon such sale being exempt from the requirements under the securities laws and regulations of each of the provinces and territories of Canada ("Canadian Securities Laws") as to the filing and delivery of a prospectus and that the Shares have not been qualified under a prospectus under Canadian Securities Laws. The Investor acknowledges that SOAC, as of the date hereof, is not a "reporting issuer" in any jurisdiction in Canada, that the Shares are subject to statutory resale restrictions under applicable Canadian Securities Laws of the province of which the Investor resides (as applicable) and under other applicable Canadian Securities Laws which resale restrictions may apply outside of Canada, and the Investor covenants that it, he or she will not resell the Shares except in compliance with such laws

x. If the Investor is located in or subject to the securities laws of a province or territory of Canada:

(i) the Investor (i) is an "accredited investor" (as defined in *National Instrument 45-106 – Prospectus Exemptions* or Section 73.3(1) of the *Securities Act* (Ontario), as applicable) in each case, satisfying the applicable requirements set forth on Schedule B, (ii) is acquiring the Shares as principal for its own account and not as agent or for the benefit of any other person or is deemed under *National Instrument 45-106 – Prospectus Exemptions* or the *Securities Act* (Ontario), as applicable, to be purchasing the Shares as principal, (iii) was not created, and is not being used, solely to purchase or hold securities as an "accredited investor", (iv) is not acquiring the Shares with a view to, or for offer or sale in connection with, any distribution thereof in violation of Canadian Securities Laws, (v) is a "permitted client" (as defined in *National Instrument 31-103 – Registration Requirements, Exemptions and Ongoing Registrant Obligations*) satisfying the applicable requirements set forth on Schedule C, and (vi) has completed Schedule B and Schedule C hereto and the information contained therein is accurate and complete.

(ii) the Investor acknowledges receipt of the presentation entitled " Revolutionizing the Mineral Supply Chain for Fast Growing EV Demand – Investment summary for The Metals Company, Inc." dated March 4, 2021 (the "Investor Presentation"), including the "Notice to Canadian Investors" therein, and that, except for the Investor Presentation, it has not received or been provided with, nor has it requested, nor does it have any need to receive, any offering memorandum (within the meaning of Canadian Securities Laws), any prospectus, sales or advertising literature, or any other document describing or purporting to describe SOAC, its business and affairs or the transactions contemplated herein (including the Transaction) which has been prepared for delivery to, and review by , prospective investors in order to assist them in making an investment decision in respect of the Shares.

y. The Investor acknowledges that:

(i) this Subscription Agreement requires the Investor to provide certain personal information relating to the Investor to SOAC. Such information is being collected and will be used by SOAC for the purposes of completing the offering, which includes, without limitation, determining the Investor's eligibility to purchase the Shares under applicable securities laws, preparing and registering certificates representing securities or arranging for non-certificated, electronic delivery of same, and completing filings required by any securities regulatory authority or stock exchange. Such personal information may be disclosed by SOAC to (a) securities regulatory authorities and stock exchanges, (b) SOAC's registrar and transfer agent, (c) any government agency, board or other entity and (d) any of the other parties involved in the offering, including the legal counsel of SOAC, and may be included in record books in connection with the offering. By executing this Subscription Agreement, the Investor expressly consents to the foregoing collection, use and disclosure of such personal information; and

(ii) the Investor acknowledges being notified that if the Investor is resident or otherwise subject to the applicable securities legislation of a jurisdiction in Canada: (i) SOAC will deliver to the applicable securities regulatory authority or regulator certain personal information pertaining to the Investor, including its full name, residential address and telephone number, email address, the number of Shares purchased by the Investor, the aggregate purchase price paid for such Shares, the prospectus exemption relied on and the date of distribution of the Shares, (ii) such information is being collected indirectly by the applicable securities regulatory authority or regulator under the authority granted to it in securities legislation, (iii) such information is being collected for the purposes of the administration and enforcement of the securities legislation of the local Canadian jurisdiction, and (iv) the Investor may contact the public officials listed on Schedule D hereto with respect to questions about the security regulatory authority's or regulator's indirect collection of such information.

z. It is the express wish of the Investor that this Subscription Agreement and any related documentation be drawn up in the English language only. *Il est de la volonté expresse de l'investisseur que la présente convention de souscription ainsi que toute documentation connexe soient rédigées en langue anglaise uniquement.*

8. Registration Rights.

a. In the event that the Shares are not registered in connection with the consummation of the Transaction, SOAC agrees that, within forty-five (45) calendar days after the Closing Date, it will file with the SEC (at its sole cost and expense) a registration statement registering the resale of the Shares (the "Registration Statement"), and it shall use its commercially reasonable efforts to have the Registration Statement declared effective as soon as practicable after the filing thereof , but no later than the earlier of (i) ninety (90) calendar days after the filing thereof (or one hundred twenty (120) calendar days after the filing thereof if the SEC notifies SOAC that it will "review" the Registration Statement) and (ii) ten (10) business days after SOAC is notified (orally or in writing, whichever is earlier) by the SEC that the Registration Statement will not be "reviewed" or will not be subject to further review; provided, however, that if such date falls on a Saturday, Sunday or other day that the SEC is closed for business, such date shall be extended to the next business day on which the SEC is open for business. SOAC agrees to cause such Registration Statement, or another shelf registration statement that includes the Shares to be sold pursuant to this Subscription Agreement, to remain effective until the earliest of (i) the third anniversary of the Closing, (ii) the date on which the Investor ceases to hold any Shares issued pursuant to this Subscription Agreement, or (iii) on the first date on which the Investor is able to sell all of its Shares issued pursuant to this Subscription Agreement (or shares received in exchange therefor) under Rule 144 within ninety (90) days without the public information required under Rule 144(c)(i) (or Rule 144(i)(2), if applicable), volume or manner of sale limitations of such rule (such date, the "End Date"). For as long as the Investor holds the Shares, SOAC will use commercially reasonable efforts to file all reports, and provide all customary and reasonable cooperation, necessary to enable the Investor to resell the Shares pursuant to the Registration Statement or Rule 144 of the Securities Act (when Rule 144 of the Securities Act becomes available to the Investor), as applicable. Prior to the End Date, SOAC will use commercially reasonable efforts to qualify the Shares for listing on the applicable stock exchange. The Investor agrees to disclose its, his or her ownership to SOAC upon request to assist it in making the determination with respect to Rule 144 described in clause (iii) above. SOAC may amend the Registration Statement so as to convert the Registration Statement to a Registration Statement on Form S-3 at such time after SOAC becomes eligible to use such Form S-3. The Investor acknowledges and agrees that SOAC may suspend the use of any such registration statement if it determines that in order for such registration statement not to contain a material misstatement or omission, an amendment thereto would be needed to include information that would at that time not otherwise be required in a current, quarterly, or annual report under the Exchange Act, provided, that, (I) SOAC shall not so delay filing or so suspend the use of the Registration Statement for a period of more than ninety (90) consecutive days or more than a total of one hundred-twenty (120) calendar days in any three hundred sixty (360) day period and (II) SOAC shall use commercially reasonable efforts to make such Registration Statement available for the sale by the Investor of such securities as soon as practicable thereafter. SOAC's obligations to include the Shares issued pursuant to this Subscription Agreement (or shares issued in exchange therefor) for resale in the Registration Statement are contingent upon the Investor furnishing in writing to SOAC such information regarding the Investor, the securities of SOAC held by the Investor and the intended method of disposition of such Shares, which shall be limited to non-underwritten public offerings, as shall be reasonably requested by SOAC to effect the registration of such Shares, and shall execute such documents in connection with such registration as SOAC may reasonably request that are customary of a selling stockholder in similar situations.

b. SOAC shall, notwithstanding any termination of this Subscription Agreement, indemnify, defend and hold harmless Investor (to the extent a seller under the Registration Statement), the officers, directors, trustees, agents, partners, members, managers, stockholders, affiliates, employees and investment advisers of each of them, each person who controls Investor (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) and the officers, directors, trustees, agents, partners, members, managers, stockholders, affiliates, employees and investment advisers of each such controlling person, to the fullest extent permitted by applicable law, from and against any and all losses, claims, damages, liabilities, costs (including, without limitation, reasonable out-of-pocket costs of preparation and investigation and reasonable attorneys' fees) and expenses (collectively, "Losses"), as incurred, that arise out of or are based upon any untrue or alleged untrue statement of a material fact contained in the Registration Statement, any prospectus included in the Registration Statement or any form of prospectus or in any amendment or supplement thereto or in any preliminary prospectus, or arising out of or relating to any omission or alleged omission to state a material fact required to be stated therein or necessary to make the statements therein (in the case of any prospectus or form of prospectus or supplement thereto, in light of the circumstances under which they were made) not misleading, except insofar as the same are caused by or contained in any information furnished in writing to SOAC by or on behalf of the Investor expressly for use therein.

c. Investor shall, severally and not jointly with any other Investor, indemnify and hold harmless SOAC, its directors, officers, agents and employees, each person who controls SOAC (within the meaning of Section 15 of the Securities Act and Section 20 of the Exchange Act), and the directors, officers, agents or employees of such controlling persons, to the fullest extent permitted by applicable law, from and against all Losses, as incurred, arising out of or are based upon any untrue or alleged untrue statement of a material fact contained in any Registration Statement, any prospectus included in the Registration Statement, or any form of prospectus, or in any amendment or supplement thereto or in any preliminary prospectus, or arising out of or relating to any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein (in the case of any prospectus, or any form of prospectus or supplement thereto, in light of the circumstances under which they were made) not misleading to the extent, but only to the extent, that such untrue statements or omissions are based solely upon information regarding Investor furnished in writing to SOAC by Investor expressly for use therein. In no event shall the liability of Investor be greater in amount than the dollar amount of the net proceeds received by Investor upon the sale of the Shares giving rise to such indemnification obligation. Notwithstanding the forgoing, Investor's indemnification obligations shall not apply to amounts paid in settlement of any Losses or action if such settlement is effected without the prior written consent of Investor (which consent shall not be unreasonably withheld, conditioned or delayed).

9. Termination. This Subscription Agreement shall terminate and be void and of no further force and effect, and all rights and obligations of the parties hereunder shall terminate without any further liability on the part of any party in respect thereof, upon the earliest to occur of (a) such date and time as the Transaction Agreement is terminated in accordance with its terms prior to the occurrence of the Transaction Closing, (b) upon the mutual written agreement of each of the parties hereto and the Company to terminate this Subscription Agreement, (c) thirty (30) days after the Termination Date (as defined in the Transaction Agreement), if the Closing has not occurred by such date other than as a result of a breach of Investor's obligations hereunder, or (d) if any of the conditions to Closing set forth in Section 4 of this Subscription Agreement are (i) not satisfied or waived prior to the Closing or (ii) not capable of being satisfied on the Closing and, in each case of (i) and (ii), as a result thereof, the transactions contemplated by this Subscription Agreement will not be and are not consummated at the Closing (the termination events described in clauses (a)–(d) above, collectively, the "Termination Events"); provided that nothing herein will relieve any party from liability for any willful breach hereof prior to the time of termination, and each party will be entitled to any remedies at law or in equity to recover losses, liabilities or damages arising from any such willful breach. SOAC shall notify the Investor in writing of the termination of the Transaction Agreement as promptly as practicable after the termination of such agreement. Upon the occurrence of any Termination Event, this Subscription Agreement shall be void and of no further effect and any monies paid by the Investor to SOAC in connection herewith shall promptly (and in any event within one (1) business day) following the Termination Event be returned to the Investor.

10. Trust Account Waiver. The Investor acknowledges that SOAC is a blank check company with the powers and privileges to effect a merger, asset acquisition, reorganization or similar business combination involving SOAC and one or more businesses or assets. The Investor further acknowledges that, as described in SOAC's prospectus relating to its initial public offering dated March 17, 2020 (the "Prospectus") available at www.sec.gov, substantially all of SOAC's assets consist of the cash proceeds of SOAC's initial public offering and private placement of its securities, and substantially all of those proceeds have been deposited in a trust account (the "Trust Account") for the benefit of SOAC, its public shareholders and the underwriters of SOAC's initial public offering. Except with respect to interest earned on the funds held in the Trust Account that may be released to SOAC to pay its tax obligations and to fund certain of its working capital requirements, the cash in the Trust Account may be disbursed only for the purposes set forth in the Prospectus. For and in consideration of SOAC entering into this Subscription Agreement, the receipt and sufficiency of which are hereby acknowledged, the Investor hereby irrevocably waives any and all right, title and interest, or any claim of any kind it, he or she has or may have in the future, in or to any monies held in the Trust Account, and agrees not to seek recourse against the Trust Account as a result of, or arising out of, this Subscription Agreement; provided, however, that nothing in this Section 10 shall be deemed to limit the Investor's right, title, interest or claim to any monies held in the Trust Account by virtue of its, his or her record or beneficial ownership of Shares currently outstanding on the date hereof, pursuant to a validly exercised redemption right with respect to any such Shares, except to the extent that the Investor has otherwise agreed with SOAC to not exercise such redemption right.

11. Miscellaneous.

a. Neither this Subscription Agreement nor any rights that may accrue to the parties hereunder (other than the Shares acquired hereunder, if any) may be transferred or assigned without the prior written consent of each of the other parties hereto; provided that (i) this Subscription Agreement and any of the Investor's rights and obligations hereunder may be assigned to any fund or account managed by the same investment manager as the Investor or by an affiliate (as defined in Rule 12b-2 of the Exchange Act) of such investment manager without the prior consent of SOAC and (ii) the Investor's rights under Section 8 may be assigned to an assignee or transferee of the Shares; provided further that prior to such assignment any such assignee shall agree in writing to be bound by the terms hereof; provided, that no assignment pursuant to clause (i) of this Section 11 shall relieve the Investor of its, his or her obligations hereunder.

b. SOAC may request from the Investor such additional information as SOAC may reasonably deem necessary to register the resale of the Shares and evaluate the eligibility of the Investor to acquire the Shares, and the Investor shall promptly provide such information as may reasonably be requested to the extent readily available; provided, that, SOAC agrees to keep any such information provided by Investor confidential except (i) as necessary to include in any registration statement SOAC is required to file hereunder, (ii) as required by the federal securities law or pursuant to other routine proceedings of regulatory authorities or (iii) to the extent such disclosure is required by law, at the request of the staff of the SEC or regulatory agency or under the regulations of any national securities exchange on which SOAC's securities are listed for trading. The Investor acknowledges and agrees that if it, he or she does not provide SOAC with such requested information, SOAC may not be able to register the Investor's Shares for resale pursuant to Section 8 hereof. The Investor acknowledges that SOAC may file a copy of this Subscription Agreement (or a form of this Subscription Agreement) with the SEC as an exhibit to a periodic report or a registration statement of SOAC.

c. The Investor acknowledges that SOAC, the Company and others will rely on the acknowledgments, understandings, agreements, representations and warranties contained in this Subscription Agreement, including Schedule A hereto. Prior to the Closing, the Investor agrees to promptly notify SOAC and the Company if any of the acknowledgments, understandings, agreements, representations and warranties set forth in Section 7 above are no longer accurate in any material respect (other than those acknowledgments, understandings, agreements, representations and warranties qualified by materiality, in which case the Investor shall notify SOAC if they are no longer accurate in any respect). The Investor acknowledges and agrees that each purchase by the Investor of Shares from SOAC will constitute a reaffirmation of the acknowledgments, understandings, agreements, representations and warranties herein (as modified by any such notice) by the Investor as of the time of such purchase.

d. SOAC and the Company are each entitled to rely upon this Subscription Agreement and each is irrevocably authorized to produce this Subscription Agreement or a copy hereof to any interested party in any administrative or legal proceeding or official inquiry with respect to the matters covered hereby; provided, however, that the foregoing clause of this Section 11.d shall not give the Company any rights other than those expressly set forth herein and, without limiting the generality of the foregoing and for the avoidance of doubt, in no event shall the Company be entitled to rely on any of the representations and warranties of SOAC set forth in this Subscription Agreement.

e. All of the agreements, representations and warranties made by each party hereto in this Subscription Agreement shall survive the Closing.

f. This Subscription Agreement may not be modified, waived or terminated (other than pursuant to the terms of Section 9 above) except by an instrument in writing, signed by each of the parties hereto, provided, however, that no modification or waiver by SOAC of the provisions of this Subscription Agreement shall be effective without the prior written consent of the Company (other than modifications or waivers that are solely ministerial in nature or otherwise immaterial and do not affect any economic or any other material term of this Subscription Agreement). No failure or delay of either party in exercising any right or remedy hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such right or power, or any abandonment or discontinuance of steps to enforce such right or power, or any course of conduct, preclude any other or further exercise thereof or the exercise of any other right or power. The rights and remedies of the parties hereunder are cumulative and are not exclusive of any rights or remedies that they would otherwise have hereunder.

g. This Subscription Agreement (including the schedule hereto) constitutes the entire agreement, and supersedes all other prior agreements, understandings, representations and warranties, both written and oral, among the parties, with respect to the subject matter hereof. Except as set forth in Section 9, Section 11.c, Section 11.d, Section 11.f, this Section 11.g, the last sentence of Section 11.k and Section 12 with respect to the persons specifically referenced therein, this Subscription Agreement shall not confer any rights or remedies upon any person other than the parties hereto, and their respective successors and assigns, and the parties hereto acknowledge that such persons so referenced are third party beneficiaries of this Subscription Agreement with right of enforcement for the purposes of, and to the extent of, the rights granted to them, if any, pursuant to the applicable provisions.

h. Except as otherwise provided herein, this Subscription Agreement shall be binding upon, and inure to the benefit of the parties hereto and their heirs, executors, administrators, successors, legal representatives, and permitted assigns, and the agreements, representations, warranties, covenants and acknowledgments contained herein shall be deemed to be made by, and be binding upon, such heirs, executors, administrators, successors, legal representatives and permitted assigns.

i. If any provision of this Subscription Agreement shall be adjudicated by a court of competent jurisdiction to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions of this Subscription Agreement shall not in any way be affected or impaired thereby and shall continue in full force and effect.

j. This Subscription Agreement may be executed in one or more counterparts (including by facsimile or electronic mail or in .pdf) and by different parties in separate counterparts, with the same effect as if all parties hereto had signed the same document. All counterparts so executed and delivered shall be construed together and shall constitute one and the same agreement.

k. The parties hereto acknowledge and agree that irreparable damage would occur in the event that any of the provisions of this Subscription Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that the parties shall be entitled to an injunction or injunctions to prevent breaches of this Subscription Agreement, without posting a bond or undertaking and without proof of damages, to enforce specifically the terms and provisions of this Subscription Agreement, this being in addition to any other remedy to which such party is entitled at law, in equity, in contract, in tort or otherwise.

l. If any change in the number, type or classes of authorized shares of SOAC (including the Shares), other than as contemplated by the Transaction Agreement or any agreement contemplated by the Transaction Agreement, shall occur between the date hereof and immediately prior to the Closing by reason of reclassification, recapitalization, stock split (including reverse stock split) or combination, exchange or readjustment of shares, or any stock dividend, the number of Shares issued to the Investor shall be appropriately adjusted to reflect such change.

m. This Subscription Agreement shall be governed by and construed in accordance with the laws of the State of New York (regardless of the laws that might otherwise govern under applicable principles of conflicts of laws thereof) as to all matters (including any action, suit, litigation, arbitration, mediation, claim, charge, complaint, inquiry, proceeding, hearing, audit, investigation or reviews by or before any governmental entity related hereto), including matters of validity, construction, effect, performance and remedies.

n. Each party hereto, and any person asserting rights as a third party beneficiary may do so only if he, she or it, irrevocably agrees that any action, suit or proceeding between or among the parties hereto, whether arising in contract, tort or otherwise, arising in connection with any disagreement, dispute, controversy or claim arising out of or relating to this Subscription Agreement or any related document or any of the transactions contemplated hereby or thereby ("Legal Dispute") shall be brought only to the exclusive jurisdiction of the courts of the State of New York or the federal courts located in the State of New York, and each party hereto hereby consents to the jurisdiction of such courts (and of the appropriate appellate courts therefrom) in any such suit, action or proceeding and irrevocably waives, to the fullest extent permitted by law, any objection that it, he or she may now or hereafter have to the laying of the venue of any such suit, action or proceeding in any such court or that any such suit, action or proceeding that

is brought in any such court has been brought in an inconvenient forum. During the period a Legal Dispute that is filed in accordance with this Section 11.n is pending before a court, all actions, suits or proceedings with respect to such Legal Dispute or any other Legal Dispute, including any counterclaim, cross-claim or interpleader, shall be subject to the exclusive jurisdiction of such court. Each party hereto and any person asserting rights as a third party beneficiary may do so only if he, she or it hereby waives, and shall not assert as a defense in any Legal Dispute, that (a) such party is not personally subject to the jurisdiction of the above named courts for any reason, (b) such action, suit or proceeding may not be brought or is not maintainable in such court, (c) such party's property is exempt or immune from execution, (d) such action, suit or proceeding is brought in an inconvenient forum, or (e) the venue of such action, suit or proceeding is improper. A final judgment in any action, suit or proceeding described in this Section 11.n following the expiration of any period permitted for appeal and subject to any stay during appeal shall be conclusive and may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by applicable laws. EACH OF THE PARTIES HERETO AND ANY PERSON ASSERTING RIGHTS AS A THIRD PARTY BENEFICIARY MAY DO SO ONLY IF HE, SHE OR IT IRREVOCABLY AND UNCONDITIONALLY WAIVES ANY RIGHT TO TRIAL BY JURY ON ANY CLAIMS OR COUNTERCLAIMS ASSERTED IN ANY LEGAL DISPUTE RELATING TO THIS SUBSCRIPTION AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY AND FOR ANY COUNTERCLAIM RELATING THERETO. IF THE SUBJECT MATTER OF ANY SUCH LEGAL DISPUTE IS ONE IN WHICH THE WAIVER OF JURY TRIAL IS PROHIBITED, NO PARTY HERETO NOR ANY PERSON ASSERTING RIGHTS AS A THIRD PARTY BENEFICIARY SHALL ASSERT IN SUCH LEGAL DISPUTE A NONCOMPULSORY COUNTERCLAIM ARISING OUT OF OR RELATING TO THIS SUBSCRIPTION AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY. FURTHERMORE, NO PARTY HERETO NOR ANY PERSON ASSERTING RIGHTS AS A THIRD PARTY BENEFICIARY SHALL SEEK TO CONSOLIDATE ANY SUCH LEGAL DISPUTE WITH A SEPARATE ACTION OR OTHER LEGAL PROCEEDING IN WHICH A JURY TRIAL CANNOT BE WAIVED.

o. Any notice or communication required or permitted hereunder to be given to the Investor shall be in writing and either delivered personally, emailed or sent by overnight mail via a reputable overnight carrier, or sent by certified or registered mail, postage prepaid, to such address(es) or email address(es) set forth on the signature page hereto, and shall be deemed to be given and received (i) when so delivered personally, (ii) when sent, with no mail undeliverable or other rejection notice, if sent by email, or (iii) three (3) business days after the date of mailing to the address below or to such other address or addresses as the Investor may hereafter designate by notice to SOAC.

12. Non-Reliance and Exculpation. The Investor acknowledges that it, he or she is not relying upon, and has not relied upon, any statement, representation or warranty made by any person, firm or corporation, other than the statements, representations and warranties of SOAC expressly contained in Section 6 of this Subscription Agreement, in making its, his or her investment or decision to invest in SOAC. The Investor acknowledges and agrees that none of (i) any other investor pursuant to this Subscription Agreement or any other subscription agreement related to the private placement of the Shares (including the investor's respective affiliates or any control persons, officers, directors, employees, partners, agents or representatives of any of the foregoing) or (ii) any other party to the Transaction Agreement or any Non-Party Affiliate (other than SOAC with respect to the previous sentence), shall have any liability to the Investor, or to any other investor, pursuant to, arising out of or relating to this Subscription Agreement or any other subscription agreement related to the private placement of the Shares, the negotiation hereof or thereof or its subject matter, or the transactions contemplated hereby or thereby, including, without limitation, with respect to any action heretofore or hereafter taken or omitted to be taken by any of them in connection with the purchase of the Shares or with respect to any claim (whether in tort, contract or otherwise) for breach of this Subscription Agreement or in respect of any written or oral representations made or alleged to be made in connection herewith, as expressly provided herein, or for any actual or alleged inaccuracies, misstatements or omissions with respect to any information or materials of any kind furnished by SOAC, the Company or any Non-Party Affiliate concerning SOAC, the Company, any of their controlled affiliates, this Subscription Agreement or the transactions contemplated hereby. For purposes of this Subscription Agreement, "Non-Party Affiliates" means each former, current or future officer, director, employee, partner, member, manager, direct or indirect equityholder or affiliate of SOAC, the Company or any of SOAC's or the Company's controlled affiliates or any family member of the foregoing.

13. Disclosure. SOAC shall, by 9:00 a.m., New York City time, on the first (1st) business day immediately following the date of this Subscription Agreement, issue one or more press releases or file with the SEC a Current Report on Form 8-K (collectively, the "Disclosure Document") disclosing all material terms of the transactions contemplated hereby and by the Other Subscription Agreements, the Transaction and any other material, nonpublic information that SOAC has provided to the Investor at any time prior to the filing of the Disclosure Document. Upon the issuance of the Disclosure Document, to the actual knowledge of SOAC, the Investor shall not be in possession of any material, non-public information received from SOAC or any of its officers, directors, or employees or agents, and the Investor shall no longer be subject to any confidentiality or similar obligations under any current agreement, whether written or oral, with SOAC or any of its affiliates, relating to the transactions contemplated by this Subscription Agreement. Notwithstanding anything in this Subscription Agreement to the contrary, SOAC shall not publicly disclose the name of the Investor or any of its, his or her affiliates or advisers, or include the name of the Investor or any of its, his or her affiliates or advisers in any press release or in any filing with the SEC or any regulatory agency or trading market, without the prior written consent of the Investor, except (i) as required by the federal securities law or pursuant to other routine proceedings of regulatory authorities, (ii) to the extent such disclosure is required by law, at the request of the staff of the SEC or regulatory agency or under the regulations of any national securities exchange on which SOAC's securities are listed for trading or (iii) to the extent such announcements or other communications contain only information previously disclosed in a public statement, press release or other communication previously approved in accordance with this Section 13.

[*SIGNATURE PAGES FOLLOW*]

IN WITNESS WHEREOF, the Investor has executed or caused this Subscription Agreement to be executed by its, his or her duly authorized representative as of the date set forth below.

Name of Investor:	State/Country of Formation or Domicile:
By: _____	
Name: _____	
Title: _____	
Name in which Shares are to be registered (if different):	Date: _____, 2021
Investor's EIN:	
Business Address-Street:	Mailing Address-Street (if different):
City, State, Zip:	City, State, Zip:
Attn: _____	Attn: _____
Telephone No.:	Telephone No.:
Facsimile No.:	Facsimile No.:
Number of Shares subscribed for:	
Aggregate Subscription Amount: $	Price Per Share: $10.00

You must pay the Subscription Amount by wire transfer of United States dollars in immediately available funds to the account specified by SOAC in the Closing Notice.

IN WITNESS WHEREOF, SOAC has accepted this Subscription Agreement as of the date set forth below.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

By: _____

Name:

Title:

Date:
date above written

SCHEDULE A

ELIGIBILITY REPRESENTATIONS OF THE INVESTOR

A. QUALIFIED INSTITUTIONAL BUYER STATUS

(Please check the applicable subparagraphs):

£ We are a "qualified institutional buyer" (as defined in Rule 144A under the Securities Act (a "QIB")).

B. ACCREDITED INVESTOR STATUS

(Please check the applicable subparagraphs):

£ We are an "accredited investor" (within the meaning of Rule 501(a) under the Securities Act or an entity in which all of the equity holders are accredited investors within the meaning of Rule 501(a) under the Securities Act), and have marked the appropriate box in the following paragraph indicating the provision under which we qualify as an "accredited investor."

Rule 501(a), in relevant part, states that an "accredited investor" shall mean any person who comes within any of the below listed categories, or who the issuer reasonably believes comes within any of the below listed categories, at the time of the sale of the securities to that person. The Investor has indicated, by marking the appropriate box below, the provision(s) below which apply to the Investor and under which the Investor accordingly qualifies as an "accredited investor."

FOR INDIVIDUALS:

£ (a) A natural person with individual net worth (or joint net worth[1] with spouse[2]) in excess of $1,000,000. For purposes of this item, "net worth" means the excess of total assets at fair market value, including cash, stock, securities, personal property and real estate (other than your primary residence), over total liabilities (other than a mortgage or other debt secured by your primary residence). In the event that the amount of any mortgage or other indebtedness secured by your primary residence exceeds the fair market value of the residence, that excess liability should also be deducted from your net worth. Any mortgage or indebtedness secured by your primary residence incurred within 60 days before the time of the sale of the securities offered hereunder, other than as a result of the acquisition of the primary residence, shall also be deducted from your net worth.

£ (b) A natural person with individual income (without including any income of the Investor's spouse) in excess of $200,000, or joint income with spouse of $300,000, in each of the two most recent years and who reasonably expects to reach the same income level in the current year.

£ (c) A natural person who currently holds in good standing:

[1] Assets need not be purchased or held jointly to be included in the calculation of "joint net worth with such person's spouse," which includes the aggregate net worth of the Investor and the Investor's spouse.

[2] For purposes hereof, "spouse" refers to the Investor's spouse or "spousal equivalent," *i.e.*, a cohabitant occupying a relationship generally equivalent to that of a spouse.

£ a General Securities Representative license (Series 7), Private Securities Offerings Representative license (Series 82) or Investment Adviser Representative license (Series 65); or

£ the following other professional certification(s), designation(s) or credential(s) from an accredited educational institution that the U.S. Securities and Exchange Commission has designated by order as qualifying natural persons as accredited investors: _____.

£ (d) A natural person "family client" of a "family office" (each such term as defined in Rule 202(a)(11)(G)-1 under the U.S. Investment Advisers Act of 1940, as amended, and the rules and regulations promulgated thereunder), where: (A) the family office has total assets under management in excess of $5,000,000; (B) the family office is not formed for the specific purpose of acquiring limited liability company interests of the Company; and (C) the natural person family client's purchase of the limited liability company interests offered is directed by the family office, which has such knowledge and experience in financial and business matters that the family office is capable of evaluating the merits and risks of an investment in such limited liability company interests.

FOR INDIVIDUALS AND ENTITIES:

£ (e) A director, executive officer (as defined in Regulation D under the Securities Act), or manager of (or a manager of a manager of) the issuer of the shares being offered or sold.

FOR ENTITIES:

£ (f) A bank as defined in Section 3(a)(2) of the Securities Act or any savings and loan association or other institution as defined in Section 3(a)(5)(A) of the Securities Act, whether acting in its individual or fiduciary capacity.

£ (g) An investment adviser either (A) registered pursuant to Section 203 of the U.S. Investment Advisers Act of 1940, as amended, and the rules and regulations promulgated thereunder (the "Investment Advisers Act") or pursuant to the laws of any U.S. state or (B) relying on an exemption from registration under either Section 203(l) or (m) of the Investment Advisers Act.

£ (h) An insurance company as defined in Section 2(a)(13) of the Securities Act.

£ (i) A broker-dealer registered pursuant to Section 15 of the Exchange Act.

£ (j) An investment company registered under the Investment Company Act of 1940, as amended (the "Investment Company Act").

£ (k) A business development company as defined in Section 2(a)(48) of the Investment Company Act.

£ (l) A small business investment company licensed by the U.S. Small Business Administration under Section 301(c) or (d) of the Small Business Investment Act of 1958.

£ (m) A Rural Business Investment Company as defined in Section 384A of the Consolidated Farm and Rural Development Act, as amended.

£ (n) A private business development company as defined in Section 202(a)(22) of the Advisers Act.

£ (o) One of the following entities which was not formed for the specific purpose of acquiring the shares being offered or sold and which has total assets in excess of $5,000,000: (i) a corporation, limited liability company or partnership, (ii) an organization described in Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (the "Code"), or (iii) a Massachusetts or similar business trust.

£ (p) A trust with total assets in excess of $5,000,000 not formed for the specific purpose of acquiring the shares being offered or sold, whose purchase is directed by a sophisticated person with such knowledge and experience in financial and business matters as described in Rule 506(b)(2)(ii) of Regulation D under the Securities Act as to be capable of evaluating the merits and risks of an investment in the shares being offered or sold.

£ (q) A "family office," as defined in Rule 202(a)(11)(G)-1 under the Investment Advisers Act, with total assets under management in excess of $5,000,000, not formed for the specific purpose of acquiring limited liability company interests of the Company, whose purchase of the limited liability company interests offered is directed by a person with such knowledge and experience in financial and business matters as to be capable of evaluating the merits and risks of the prospective investment, or any "family client" (as defined in Rule 202(a)(11)(G)-1) thereof, the investments of which are directed by the family office.

£ (r) An employee benefit plan within the meaning of Section 3(3) of the United States Employee Retirement Income Security Act of 1974, as amended ("ERISA"), if the decision to invest in the shares being offered or sold is made by a plan fiduciary, as defined in Section 3(21) of ERISA, which is either a bank, savings and loan association, insurance company, or registered investment adviser, or if the employee benefit plan has total assets in excess of $5,000,000 or, if a self-directed plan, with investment decisions made solely by persons that are accredited investors.

£ (s) A plan established and maintained by a state, its political subdivisions, or any agency or instrumentality of a state or its political subdivisions, for the benefit of its employees, if the plan has total assets in excess of $5,000,000.

£ (t) An entity in which all of the equity owners are accredited investors as determined under any of the paragraphs (a) through (s) above; provided that the Investor makes the additional representations, warranties and covenants listed in footnote 3[3]; (Please note that this response is not applicable for irrevocable trusts).

£ (u) An entity not otherwise described in items (f) through (t) above, not formed for the specific purpose of acquiring limited liability company interests of the Company, owning Investments in excess of $5,000,000.

This page should be completed by the Investor
and constitutes a part of the Subscription Agreement.

[3] If the Investor is an accredited investor for the reason described in this clause (t), the Investor hereby represents, warrants and covenants with respect to each stockholder, partner, member or other beneficial owner of the Investor (each, a "Beneficial Owner") that: (i) the Investor is sufficiently familiar with each such Beneficial Owner's regulatory status and/or asset ownership to make representations on each such Beneficial Owner's behalf; (ii) each such Beneficial Owner qualifies as an "accredited investor" under one or more of the provisions of this Schedule A; (iii) the Company may rely on the Investor's representations on behalf of each such Beneficial Owner hereunder to the same extent as if each such Beneficial Owner had completed this Schedule A; and (iv) the Investor shall permit no direct or indirect transfer of beneficial interests in the Investor that at any time would result in any of the representations contained in clauses (i) through (iii) ceasing to be true.

SCHEDULE B

ELIGIBILITY REPRESENTATIONS OF CANADIAN INVESTOR
ACCREDITED INVESTOR CERTIFICATE

This Schedule must be completed by the Investor and forms a part of the Subscription Agreement to which it is attached. All defined terms not specifically defined in this Certificate of Accredited Investor are defined in Canadian Securities Laws.

(Check one or more, as applicable):

(a) (i) except in Ontario, a Canadian financial institution, or a Schedule III bank; or (ii) in Ontario, a financial institution described in paragraph 73.1(1) of the *Securities Act* (Ontario) (as detailed below),

(b) the Business Development Bank of Canada incorporated under the *Business Development Bank of Canada Act* (Canada),

(c) a subsidiary of any person or company referred to in paragraphs (a) or (b), if the person or company owns all of the voting securities of the subsidiary, except the voting securities required by law to be owned by directors of that subsidiary,

(d) a person registered under the securities legislation of a province or territory of Canada as an adviser or dealer, and in Ontario except as otherwise prescribed by applicable regulations,

(e) an individual registered under the securities legislation of a province or territory of Canada as a representative of a person referred to in paragraph (d),

(e.1) an individual formerly registered under the securities legislation of a province or territory of Canada, other than an individual formerly registered solely as a representative of a limited market dealer under one or both of the *Securities Act* (Ontario) or the *Securities Act* (Newfoundland and Labrador),

(f) the Government of Canada or the government of a province or territory of Canada, or any crown corporation, agency or wholly owned entity of the Government of Canada or the government of a province or territory of Canada,

(g) a municipality, public board or commission in Canada and a metropolitan community, school board, the Comité de gestion de la taxe scolaire de l'île de Montréal or an intermunicipal management board in Québec,

(h) any national, federal, state, provincial, territorial or municipal government of or in any foreign jurisdiction, or any agency of that government,

(i) a pension fund that is regulated by either the Office of the Superintendent of Financial Institutions (Canada) or a pension commission or similar regulatory authority of a province or territory of Canada,

(j) [*Intentionally deleted.*]

(j.1) an individual who beneficially owns financial assets having an aggregate realizable value that, before taxes but net of any related liabilities, exceeds CAD$5,000,000,

(k) [*Intentionally deleted.*]

(l) [*Intentionally deleted.*]

(m) a person, other than an individual or investment fund, that has net assets of at least CAD$5,000,000, as shown on its most recently prepared financial statements, and that was not formed for the sole purpose of making a representation to this effect in order to qualify as an accredited investor, (*Note: your "net income" before taxes is found on your personal income tax return.*)

(n) an investment fund that distributes or has distributed its securities only to

(i) a person that is or was an accredited investor at the time of the distribution,

(ii) a person that acquires or acquired securities in the circumstances referred to in Sections 2.10 [*Minimum amount investment*] or 2.19 [*Additional investment in investment funds*] of NI 45-106 or equivalent exemptions under applicable securities legislation as specified in Section 8.2 of NI 45-106, or

(iii) a person described in paragraph (i) or (ii) that acquires or acquired securities under Section 2.18 [*Investment fund reinvestment*] of NI 45-106,

(o) an investment fund that distributes or has distributed securities under a prospectus in a province of Canada for which the regulator or, in Quebec, the securities regulatory authority, has issued a receipt,

(p) a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a province or territory of Canada or a foreign jurisdiction, acting on behalf of a fully managed account managed by the trust company or trust corporation, as the case may be,

(q) a person acting on behalf of a fully managed account managed by that person, if that person is registered or authorized to carry on business as an adviser or the equivalent under the securities legislation of a province or territory of Canada or a foreign jurisdiction,

(r) a registered charity under the *Income Tax Act* (Canada) that, in regard to the trade, has obtained advice from an eligibility adviser or an adviser registered under the securities legislation of the province or territory of the registered charity to give advice on the securities being traded,

(s) an entity organized in a foreign jurisdiction that is analogous to any of the entities referred to in paragraphs (a) to (d) or paragraph (i) in form and function,

(t) a person in respect of which all of the owners of interests, direct, indirect or beneficial, except the voting securities required by law to be owned by directors, are persons that are accredited investors. ***If you checked (t), please indicate the name and category of accredited investor (by reference to the applicable letter in this Appendix "A") of each of:***

	Name:	**Category of Accredited Investor**
Owner:		
Owner:		
Owner:		

[attach sheet if more than 3 owners]

(u) an investment fund that is advised by a person registered as an adviser or a person that is exempt from registration as an adviser,

(v) a person that is recognized or designated by the securities regulatory authority or, except in Ontario and Québec, the regulator as an accredited investor, or

(w) a trust established by an accredited investor for the benefit of the accredited investor's family members of which a majority of the trustees are accredited investors and all of the beneficiaries are the accredited investor's spouse, a former spouse of the accredited investor or a parent, grandparent, brother, sister, child or grandchild of that accredited investor, of that accredited investor's spouse or of that accredited investor's former spouse. ***If you checked (w), please indicate the name and category of accredited investor (by reference to the applicable letter in this Appendix "A" of each of:***

	Name:	**Category of Accredited Investor**
Individual who established trust:		
Trustee:		
Trustee:		
Trustee:		

[attach sheet if more than 3 trustees]

SCHEDULE C

ELIGIBILITY REPRESENTATIONS OF CANADIAN INVESTOR
PERMITTED CLIENT CERTIFICATE

This Schedule must be completed by the Investor and forms a part of the Subscription Agreement to which it is attached. All defined terms not specifically defined in this Certificate of Permitted Client are defined in Canadian Securities Law.

(Check one or more, as applicable):

£ (a) a Canadian financial institution or a Schedule III bank;

£ (b) the Business Development Bank of Canada incorporated under the *Business Development Bank of Canada Act* (Canada);

£ (c) a subsidiary of any person or company referred to in paragraph (a) or (b), if the person or company owns all of the voting securities of the subsidiary, except the voting securities required by law to be owned by directors of the subsidiary;

£ (d) a person or company registered under the securities legislation of a jurisdiction of Canada as an adviser, investment dealer, mutual fund dealer or exempt market dealer;

£ (e) a pension fund that is regulated by either the federal Office of the Superintendent of Financial Institutions or a pension commission or similar regulatory authority of a jurisdiction of Canada or a wholly-owned subsidiary of such a pension fund;

£ (f) an entity organized in a foreign jurisdiction that is analogous to any of the entities referred to in paragraphs (a) to (e);

£ (g) the Government of Canada or a jurisdiction of Canada, or any Crown corporation, agency or wholly-owned entity of the Government of Canada or a jurisdiction of Canada;

£ (h) any national, federal, state, provincial, territorial or municipal government of or in any foreign jurisdiction, or any agency of that government;

£ (i) a municipality, public board or commission in Canada and a metropolitan community, school board, the *Comité de gestion de la taxe scolaire de l'île de Montréal* or an intermunicipal management board in Québec;

£ (j) a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a jurisdiction of Canada or a foreign jurisdiction, acting on behalf of a managed account managed by the trust company or trust corporation, as the case may be;

£ (k) a person or company acting on behalf of a managed account managed by the person or company, if the person or company is registered or authorized to carry on business as an adviser or the equivalent under the securities legislation of a jurisdiction of Canada or a foreign jurisdiction;

£ (l) an investment fund if one or both of the following apply:

(i) the fund is managed by a person or company registered as an investment fund manager under the securities legislation of a jurisdiction of Canada;

(ii) the fund is advised by a person or company authorized to act as an adviser under the securities legislation of a jurisdiction of Canada;

£ (m) in respect of a dealer, a registered charity under the *Income Tax Act* (Canada) that obtains advice on the securities to be traded from an eligibility adviser, as defined in section 1.1 of National Instrument 45-106 *Prospectus and Registration Exemptions*, or an adviser registered under the securities legislation of the jurisdiction of the registered charity;

£ (n) in respect of an adviser, a registered charity under the *Income Tax Act* (Canada) that is advised by an eligibility adviser, as defined in section 1.1 of National Instrument 45-106 *Prospectus and Registration Exemptions*, or an adviser registered under the securities legislation of the jurisdiction of the registered charity;

£ (o) an individual who beneficially owns financial assets, as defined in section 1.1 of National Instrument 45-106 *Prospectus and Registration Exemptions*, having an aggregate realizable value that, before taxes but net of any related liabilities, exceeds C$5 million;

£ (p) a person or company that is entirely owned by an individual or individuals referred to in paragraph (o), who holds the beneficial ownership interest in the person or company directly or through a trust, the trustee of which is a trust company or trust corporation registered or authorized to carry on business under the *Trust and Loan Companies Act* (Canada) or under comparable legislation in a jurisdiction of Canada or a foreign jurisdiction;

£ (q) a person or company, other than an individual or an investment fund, that has net assets of at least C$25 million as shown on its most recently prepared financial statements;

£ (r) a person or company that distributes securities of its own issue in Canada only to persons or companies referred to in paragraphs (a) to (q) above.

SCHEDULE D

CONTACT INFORMATION – CANADIAN PROVINCIAL AND TERRITORIAL SECURITIES REGULATORY AUTHORITIES

The contact information of the public official in the local jurisdiction who can answer questions about the security regulatory authority's or regulator's indirect collection of information is as follows:

Alberta Securities Commission
Suite 600, 250 – 5th Street SW
Calgary, Alberta T2P 0R4
Telephone: (403) 297-6454
Toll free in Canada: 1-877-355-0585
Facsimile: (403) 297-2082

British Columbia Securities Commission
P.O. Box 10142, Pacific Centre
701 West Georgia Street
Vancouver, British Columbia V7Y 1L2
Inquiries: (604) 899-6854
Toll free in Canada: 1-800-373-6393
Facsimile: (604) 899-6581
Email: inquiries@bcsc.bc.ca

The Manitoba Securities Commission
500 – 400 St. Mary Avenue
Winnipeg, Manitoba R3C 4K5
Telephone: (204) 945-2548
Toll free in Manitoba 1-800-655-5244
Facsimile: (204) 945-0330

Financial and Consumer Services Commission (New Brunswick)
85 Charlotte Street, Suite 300
Saint John, New Brunswick E2L 2J2
Telephone: (506) 658-3060
Toll free in Canada: 1-866-933-2222
Facsimile: (506) 658-3059
Email: info@fcnb.ca

Government of Newfoundland and Labrador
Financial Services Regulation Division
P.O. Box 8700
Confederation Building
2nd Floor, West Block
Prince Philip Drive
St. John's, Newfoundland and Labrador A1B 4J6
Attention: Director of Securities
Telephone: (709) 729-4189
Facsimile: (709) 729-6187

Government of the Northwest Territories
Office of the Superintendent of Securities
P.O. Box 1320
Yellowknife, Northwest Territories X1A 2L9
Attention: Deputy Superintendent, Legal & Enforcement
Telephone: (867) 920-8984
Facsimile: (867) 873-0243

Nova Scotia Securities Commission
Suite 400, 5251 Duke Street
Duke Tower
P.O. Box 458
Halifax, Nova Scotia B3J 2P8
Telephone: (902) 424-7768
Facsimile: (902) 424-4625

Government of Nunavut
Department of Justice
Legal Registries Division
P.O. Box 1000, Station 570
1st Floor, Brown Building
Iqaluit, Nunavut X0A 0H0
Telephone: (867) 975-6590
Facsimile: (867) 975-6594

Ontario Securities Commission
20 Queen Street West, 22nd Floor
Toronto, Ontario M5H 3S8
Telephone: (416) 593- 8314
Toll free in Canada: 1-877-785-1555
Facsimile: (416) 593-8122
Email: exemptmarketfilings@osc.gov.on.ca
Public official contact regarding indirect collection of information: Inquiries Officer

Prince Edward Island Securities Office
95 Rochford Street, 4th Floor Shaw Building
P.O. Box 2000
Charlottetown, Prince Edward Island C1A 7N8
Telephone: (902) 368-4569
Facsimile: (902) 368-5283

Financial and Consumer Affairs Authority of Saskatchewan
Suite 601 - 1919 Saskatchewan Drive
Regina, Saskatchewan S4P 4H2
Telephone: (306) 787-5879
Facsimile: (306) 787-5899

Autorité des marchés financiers
800, Square Victoria, 22e étage
C.P. 246, Tour de la Bourse
Montréal, Québec H4Z 1G3
Telephone: (514) 395-0337 or 1-877-525-0337
Facsimile: (514) 873-6155 (For filing purposes only)
Facsimile: (514) 864-6381 (For privacy requests only)
Email: financementdessocietes@lautorite.qc.ca (For corporate finance issuers);
Email: fonds_dinvestissement@lautorite.qc.ca (For investment fund issuers)

Office of the Superintendent of Securities
Government of Yukon
Department of Community Services
307 Black Street, 1st floor
Box 2703, C-6
Whitehorse, Yukon Y1A 2C6
Telephone: (867) 667-5466
Facsimile: (867) 393-6251
Email: Securities@gov.yk.ca

ANNEX F

TRANSACTION SUPPORT AGREEMENT

THIS AGREEMENT is made as of [•], 2021

BETWEEN:

The person executing this Agreement as "Shareholder" on the signature page hereof (the "**Shareholder**");

- and -

Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company ("**SOAC**").

RECITALS:

WHEREAS, on the date hereof, SOAC, 1291924 B.C. Unlimited Liability Company ("**NewCo Sub**"), DeepGreen Metals Inc. (the "**Company**"), entered into a business combination agreement (the "**Business Combination Agreement**"), a copy of which has been provided to the Shareholder, pursuant to which, among other things, (i) SOAC will acquire all of the issued and outstanding Company Shares (as defined herein) from the shareholders of the Company (the "**Company Shareholders**") in exchange for SOAC Common Shares and Company Earnout Shares by means of a statutory plan of arrangement (the "**Arrangement**") under Part 9, Division 5 of the *Business Corporations Act* (British Columbia), (ii) the Company will become a wholly-owned Subsidiary of SOAC, and (iii) the Company and NewCo Sub will amalgamate to continue as one company, the whole upon and subject to the terms and conditions set forth in the Business Combination Agreement and the Arrangement;

WHEREAS, the Shareholder is the holder of record and beneficial owner of the common shares in the capital of the Company (the "**Company Common Shares**") and/or the Class B preferred shares in the capital of the Company (the "**Company Preferred Shares**") and/or the options to purchase Company Common Shares (the "**Company Options**") and/or the warrant exercisable to purchase Company Common Shares (the "**Company Warrant**") on the Shareholder's signature page hereto, which will be subject to the Arrangement in accordance with the Business Combination Agreement;

WHEREAS, concurrently with the execution of this Agreement and the Business Combination Agreement, (i) Company Shareholders representing at least $66^{2/3}$% of the issued Company Shares, and (ii) Company Shareholders and holders of Company Options and Company Warrant representing at least $66^{2/3}$% of the Company Common Shares, Company Options and Company Warrant, taken together, have executed and delivered an agreement substantially in the same form and on the same terms as this Agreement;

WHEREAS, the Shareholder acknowledges that SOAC would not enter into the Business Combination Agreement and the Arrangement but for the execution and delivery of this Agreement by the Shareholder;

WHEREAS, the Company Board has unanimously (a) determined that the transactions contemplated by the Business Combination Agreement and the Ancillary Documents are in the best interests of the Company and fair to the Company Shareholders, (b) approved the Business Combination Agreement, the Ancillary Documents to which the Company is or will be a party and the transactions contemplated hereby and thereby and (c) recommended, among other things, that the Company Shareholders vote in favor of the Arrangement; and

WHEREAS, this Agreement sets out the terms and conditions of the agreement of the Shareholder to abide by the covenants in respect of the Company Securities (as defined herein) and the other restrictions and covenants set forth herein.

NOW THEREFORE, in consideration of the premises and the covenants and agreements herein contained, the Parties agree as follows:

ARTICLE 1
INTERPRETATION

1.1 Definitions

Capitalized terms used, and not otherwise defined, herein have the meanings ascribed to them in the Business Combination Agreement. In this Agreement:

"**Agreement**" means this transaction support agreement;

"**Arrangement**" has the meaning set forth in the recitals of this Agreement;

"**Business Combination Agreement**" has the meaning set forth in the recitals of this Agreement;

"**Company**" has the meaning set forth in the recitals of this Agreement;

"**Company Common Shares**" has the meaning set forth in the recitals of this Agreement;

"**Company Options**" has the meaning set forth in the recitals of this Agreement;

"**Company Preferred Shares**" has the meaning set forth in the recitals of this Agreement;

"**Company Securities**" means the Company Shares, the Company Options and the Company Warrant;

"**Company Shares**" means the Company Common Shares and the Company Preferred Shares listed on the Shareholder's signature page hereto and any Company Common Shares or Company Preferred Shares acquired beneficially or of record by the Shareholder subsequent to the date hereof, and includes all securities which may be converted into, exchanged for or otherwise changed into, including, for the avoidance of doubt, any Company Common Shares issuable upon the exercise of Company Options or the conversion of Company Preferred Shares or other securities;

"**Company Warrant**" has the meaning set forth in the recitals of this Agreement;

"**NewCo Sub**" has the meaning set forth in the recitals of this Agreement;

"**Parties**" means the Shareholder and SOAC, collectively, and "**Party**" means any one of them, as the context requires;

"**Permitted Transferee**" has the meaning set forth in section 4.1(a)(iii) of this Agreement;

"**Shareholder**" has the meaning set forth in the introductory paragraph to this Agreement;

"**SOAC**" has the meaning set forth in the introductory paragraph to this Agreement; and

"**Transfer**" has the meaning set forth in section 4.1(a)(iii) of this Agreement.

1.2 Incorporation of Schedule

The Shareholder's signature page to this Agreement forms an integral part of this Agreement for all purposes of it.

ARTICLE 2
REPRESENTATIONS AND WARRANTIES

2.1 Representations and Company Warranties of the Shareholder

The Shareholder represents and warrants to and in favour of SOAC as follows and acknowledges that SOAC is relying upon such representations and warranties in entering into this Agreement and the Business Combination Agreement:

(a) The Shareholder, if not an individual, is a corporation, limited liability company or other applicable business entity duly organized, incorporated or formed, as applicable, validly existing and in good standing (or the equivalent thereof, if applicable, in each case, with respect to the jurisdictions that recognize the concept of good standing or any equivalent thereof) under the Laws of its jurisdiction of formation or organization (as applicable). The Shareholder, if an individual, has the legal capacity to enter into and perform his or her obligations under this Agreement.

(b) The Shareholder, if not an individual, has the requisite corporate power and authority to execute and deliver this Agreement, to perform its obligations hereunder and to consummate the transactions contemplated by this Agreement. This Agreement has been duly authorized by all necessary corporate action on the part of the Shareholder. This Agreement has been duly and validly executed and delivered by the Shareholder and constitutes a legal, valid and binding agreement of the Shareholder (assuming that this Agreement has been duly authorized, executed and delivered by SOAC) enforceable against the Shareholder in accordance with its terms (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity).

(c) The Shareholder is the sole holder of, record and beneficial owner of, or exercises control or direction over, and at the Effective Time and at all times between the date hereof and the Effective Time, the Shareholder will be the sole holder of, record and beneficial owner of, or exercise control or direction over, all the Company Securities set forth on the Shareholder's signature page hereto, with good title thereto, free and clear of all Liens (other than transfer restrictions under this Agreement, the Governing Documents of the Shareholder and applicable Securities Laws). Other than the Company Securities set forth on the Shareholder's signature page hereto, the Shareholder does not own, beneficially or of record, and is not a party to or bound by any agreement or option, or right or privilege (whether by law, pre-emptive or contractual) capable of becoming an agreement or option, for the purchase or acquisition by the Shareholder of, any additional securities, or any securities convertible or exchangeable into any additional securities, of the Company, except as may be required under the Governing Documents of the Shareholder.

(d) Except as contemplated by the Business Combination Agreement or the Governing Documents of the Shareholder, no Person has any contractual right or privilege for the purchase or acquisition from the Shareholder of any of the Company Securities or for the right to vote any of the Company Securities.

(e) There are no legal proceedings in progress or pending before any Governmental Entity or, to the knowledge of the Shareholder, threatened against the Shareholder that would adversely affect in any manner the ability of the Shareholder to enter into this Agreement and to perform its obligations hereunder in any material respect.

(f) No consent, approval, order or authorization of, or designation, declaration or filing with, any Person is required on the part of the Shareholder with respect to the execution, delivery or performance of its obligations under this Agreement by the Shareholder, the performance by the Shareholder of its obligations under this Agreement and the completion of the transactions contemplated by this Agreement, other than those which are contemplated by the Business Combination Agreement, except for any consents, approvals, authorizations, designations, declarations, waivers or filings, the absence of which would not adversely affect the ability of the Shareholder to perform, or otherwise comply with, any of its covenants, agreements or obligations hereunder in any material respect, or which have already been obtained in advance of the Shareholder's entry into this Agreement.

(g) None of the execution or delivery by the Shareholder of this Agreement, the performance by the Shareholder of its obligations hereunder or the consummation of the transactions contemplated hereby or pursuant to the Business Combination Agreement will, directly or indirectly (with or without due notice or lapse of time or both), (i) result in a violation or breach of any provision of the Governing Documents of the Shareholder, (ii) result in a violation or breach of, or constitute a default or give rise to any right of termination, Consent, cancellation, amendment, modification, suspension, revocation or acceleration under, any of the terms, conditions or provisions of any Contract to which the Shareholder is a party, (iii) violate, or constitute a breach under, any Order or applicable Law to which the Shareholder or any of its properties or assets are subject or bound or (iv) result in the creation of any Lien upon the Company Securities of the Shareholder, except, in the case of any of clauses (ii) through (iv) above, as would not adversely affect the ability of the Shareholder to perform, or otherwise comply with, any of its covenants, agreements or obligations hereunder in any material respect.

2.2 Representations and Company Warranties of SOAC

SOAC represents and warrants to and in favour of the Shareholder as follows and acknowledges that the Shareholder is relying upon such representations and warranties in entering into this Agreement:

(a) SOAC is an exempted company, corporation, limited liability company or other applicable business entity duly organized, incorporated or formed, as applicable, validly existing and in good standing (or the equivalent thereof, if applicable, in each case, with respect to the jurisdictions that recognize the concept of good standing or any equivalent thereof) under the Laws of its jurisdiction of organization, incorporation or formation (as applicable).

(b) SOAC has the requisite exempted company, corporate, limited liability company or other similar power and authority to execute and deliver each of this Agreement and the Business Combination Agreement, to perform its obligations hereunder and thereunder, and to consummate the transactions contemplated hereby and thereby. Each of this Agreement and the Business Combination Agreement has been duly authorized by all necessary exempted company, corporate, limited liability company or other similar action on the part of SOAC. Each of this Agreement and the Business Combination Agreement has been duly and validly executed and delivered by SOAC and constitutes a legal, valid and binding agreement of SOAC (assuming that this Agreement or the Business Combination Agreement, as applicable, has been duly authorized, executed and delivered by the other Persons party thereto), enforceable against SOAC in accordance with its terms (subject to applicable bankruptcy, insolvency, reorganization, moratorium or other Laws affecting generally the enforcement of creditors' rights and subject to general principles of equity).

(c) None of the execution and delivery by SOAC of this Agreement or the Business Combination Agreement, the performance of SOAC of its obligations hereunder and thereunder, or the consummation by SOAC of the transactions contemplated hereby and thereby will, directly or indirectly (with or without due notice or lapse of time or both), (i) result in a violation or breach of any provision of the Governing Documents of SOAC, (ii) result in a violation or breach of, or constitute a default or give rise to any right of termination, Consent, cancellation, amendment, modification, suspension, revocation or acceleration under, any of the terms, conditions or provisions of any Contract to which SOAC is a party, (iii) violate, or constitute a breach under, any Order or applicable Law to which SOAC or any of its properties or assets are subject or bound or (iv) result in the creation of any Lien upon any of the assets or properties (other than any Permitted Liens) of SOAC, except in the case of any of clauses (ii) through (iv) above, as would not have a SOAC Material Adverse Effect.

ARTICLE 3
SHAREHOLDER ACKNOWLEDGMENT AND CONSENT

3.1 Acknowledgment and Consent of the Shareholder

Until the termination of this Agreement in accordance with its terms, the Shareholder:

(a) irrevocably and unconditionally consents to and approves the entering into and execution by the Company of the Business Combination Agreement and all Ancillary Documents to which the Company is or will be a party and the consummation of the Arrangement and the transactions contemplated by the Business Combination Agreement; and

(b) irrevocably and unconditionally consents to the details of this Agreement being set out in the Company Information Circular to be prepared in connection with the Company Shareholders Meeting and for the form of this Agreement to be filed with the SEC and any other Governmental Entity, in connection with the Transactions.

ARTICLE 4
COVENANTS

4.1 Covenants of the Shareholder

(a) The Shareholder hereby irrevocably and unconditionally covenants, undertakes and agrees, from time to time, until the earlier of (i) the Effective Time, and (ii) the termination of this Agreement in accordance with Section 5.1 hereof:

(i) to cause to be counted as present for purposes of establishing quorum all the Company Securities, at any meeting of any of the securityholders of the Company at which the Shareholder is entitled to vote, including the Company Shareholders Meeting, or at any adjournment thereof or in any other circumstances upon which a vote, consent or other approval with respect to the Transactions contemplated by the Business Combination Agreement (including, for greater certainty, any Alternative Transaction) is sought, or in any action by written consent of the securityholders of the Company, and to vote or cause to be voted (in person, by proxy, by action by written consent, as applicable, or as otherwise may be required under the articles of the Company) all the Company Securities, in favour of the approval, consent, ratification and adoption of the Company Arrangement Resolution and the Transactions contemplated by the Business Combination Agreement (including any Alternative Transaction). For greater certainty, in the event of any proposed Alternative Transaction, any reference in this Agreement to the Arrangement, the Business Combination Agreement or the Arrangement Resolution shall refer to the Alternative Transaction, all related documentation in order to complete the Alternative Transaction or any resolution in respect thereto. To the extent applicable, all terms, covenants, representations and warranties of this Agreement shall be and shall be deemed to have been made in the context of such Alternative Transaction.

(ii) to cause to be counted as present for purposes of establishing quorum all the Company Securities, at any meeting of any of the securityholders of the Company at which the Shareholder is entitled to vote, or at any adjournment thereof or in any other circumstances upon which a vote, consent or other approval, with respect to matters contemplated by clause (A) or clause (B) of this Section 4.1(a)(ii), is sought, or in any action by written consent of the securityholders of the Company, and to vote or cause to be voted (in person, by proxy or by action by written consent, as applicable, or as otherwise may be required under the articles of the Company) all the Company Securities, in opposition to: (A) any Company Acquisition Proposal; and (B) any other matter, action or proposal which would reasonably be expected to result in a breach of any representation, warranty, covenant or other obligation of the Company under the Business Combination Agreement if such breach requires securityholder approval and is communicated as being such a breach in a notice in writing delivered by SOAC to the Shareholder; provided that, in the case of either clause (A) or clause (B) of this Section 4.1(a)(ii), the Business Combination Agreement shall not have been amended or modified without the Shareholder's written consent to decrease, or change the form of, the consideration payable to Company Shareholders or holders of Company Options or Company Warrant;

(iii) except pursuant to the Plan of Arrangement or as otherwise expressly contemplated by the Business Combination Agreement or with the prior written consent of SOAC (such consent to be given or withheld in its sole discretion), not to (A) Transfer any Company Securities, or any right or interest therein, (B) enter into (1) any option, warrant, purchase right, or other Contract that could (either alone or in connection with one or more events, developments or events (including the satisfaction or waiver of any conditions precedent)) require such Shareholder to Transfer any Company Securities, or any right or interest therein, or (2) any voting trust, proxy or other Contract with respect to the voting or Transfer of any Company Securities, or any right or interest therein, in a manner inconsistent with the covenants and obligations of this Agreement, or (C) enter

into any Contract to take, or cause to be taken, any of the actions set forth in clauses (A) or (B); provided, however, that the foregoing shall not apply to any Transfer (1) to any Affiliate of such Shareholder; (2) in the case of an individual, by gift to a member of one of the individual's immediate family, to a trust, the beneficiary of which is a member of the individual's immediate family or an Affiliate of such individual; (3) in the case of an individual, by virtue of laws of descent and distribution upon death of the individual; (4) in the case of an individual, pursuant to a qualified domestic relations order; or (5) by virtue of the Shareholder's organizational documents upon liquidation or dissolution of the Shareholder (any transferee of the type set forth in clauses (1) through (5) a "**Permitted Transferee**"); provided, that the transferring Shareholder shall, and shall cause any Permitted Transferee, to enter into a written agreement in form and substance reasonably satisfactory to SOAC, agreeing to be bound by this Agreement (which will include, for the avoidance of doubt, all of the covenants, agreements and obligations of the transferring Shareholder hereunder and the making of all applicable representations and warranties of the transferring Shareholder set forth in Article 2 with respect to such transferee and his, her or its Company Securities, or any right or interest therein, received upon such Transfer, as applicable) prior and as a condition to the occurrence of such Transfer. For purposes of this Agreement, "**Transfer**" means any, direct or indirect, sale, transfer, assignment, pledge, mortgage, exchange, hypothecation, grant of a security interest or encumbrance in or disposition of an interest (whether with or without consideration, whether voluntarily or involuntarily or by operation of law or otherwise).

(iv) not to exercise any dissent rights in respect of any transaction contemplated by the Business Combination Agreement, including any Alternative Transaction;

(v) to execute and deliver all related documentation and take such other actions in support of the Arrangement and the transactions contemplated by the Business Combination Agreement as shall reasonably be requested by the Company or SOAC to consummate the Transactions, including any Alternative Transaction;

(vi) the Shareholder hereby revokes any and all previous proxies granted or voting instruction forms or other voting documents delivered that conflict, or are inconsistent, with the matters set forth in this Agreement;

(vii) not take any other action of any kind, directly or indirectly, which would make any representation or warranty of the Shareholder set forth in this Agreement untrue or incorrect in any material respect or might reasonably be regarded, individually or in the aggregate, as likely to reduce the success of, or delay or interfere with, the completion of the Transactions contemplated by the Business Combination Agreement, including any Alternative Transaction;

(viii) the Shareholder shall be bound by and subject to ***Sections* 5.3(a) (*Confidentiality and Access to Information*), 5.4(a) (*Public Announcements*)** and **5.6(a) (*Exclusive Dealing*)** of the Business Combination Agreement to the same extent that ***Sections* 5.3(a) (*Confidentiality and Access to Information*), 5.4(a) (*Public Announcements*)** and **5.6(a) (*Exclusive Dealing*)** of the Business Combination Agreement apply to the Company, *mutatis mutandis*, as if the Shareholder is directly party thereto; provided that, notwithstanding anything in this Agreement to the contrary, any breach by the Company of its obligations under the Business Combination Agreement shall not be considered a breach of this Section 4.1(a)(viii); and

(ix) the Shareholder hereby grants an irrevocable power of attorney and hereby irrevocably constitutes and appoints SOAC, or any individual designated by SOAC, as attorney in fact (which appointment is coupled with an interest), with full power of substitution in favour of SOAC, to take all such actions and execute and deliver such documents, instruments or agreements as are necessary to give effect to the covenants set forth in this Article 4.

(b) If the Shareholder acquires or is issued any additional Company Securities following the date hereof, the Shareholder acknowledges that such additional Company Securities shall be deemed to be Company Securities for the purposes of this Agreement.

ARTICLE 5
GENERAL

5.1 Termination

This Agreement shall automatically terminate, without any notice or other action on the part of any Party, upon the earliest to occur of the following:

(a) the Effective Time;

(b) the date upon which the Parties agree in writing to terminate this Agreement;

(c) the date of earlier termination of the Business Combination Agreement in accordance with its terms, except if such termination is made in connection with an Alternative Transaction; and

(d) the amendment or modification of the Business Combination Agreement without the Shareholder's written consent to decrease, or change the form of, the consideration payable to Company Shareholders or holders of Company Options.

5.2 Fiduciary Duties

Notwithstanding anything in this Agreement to the contrary, (a) the Shareholder makes no agreement or understanding herein in any capacity other than in the Shareholder's capacity as a record holder and/or beneficial owner of the Company Securities and not in such Shareholder's capacity as a director, officer or employee of the Company and (b) nothing herein will be construed to limit or affect any action or inaction by the Shareholder or any representative of the Shareholder serving as a member of any Group Company Board or as an officer, employee or fiduciary of any Group Company, in each case, acting in such person's capacity as a director, officer, employee or fiduciary of such Group Company.

5.3 Effect of Termination

If this Agreement is terminated pursuant to Section 5.1, this Agreement shall become void and of no force and effect and no Party will have any liability or further obligation to the other Party hereunder. Notwithstanding the foregoing or anything to the contrary in this Agreement, (i) the termination of this Agreement pursuant to Section 5.1(c) shall not affect any Liability on the part of any Party for a Willful Breach of any covenant or agreement set forth in this Agreement prior to such termination or Fraud, (ii) Section 4.1(a)(viii) (solely to the extent that it relates to ***Section 5.3(a) (Confidentiality and Access to Information)*** of the Business Combination Agreement) and this Article 5 (to the extent related to any of the provisions that survive the termination of this Agreement and excluding Section 5.10 (solely to the extent that it relates to ***Section 9.1 (Non Survival)*** of the Business Combination Agreement)) shall survive the termination of this Agreement and (iii) Section 4.1(a)(viii) (solely to the extent that it relates to ***Section 5.4(a) (Public Announcements)*** of the Business Combination Agreement) and Section 5.10 (solely to the extent that it relates to ***Section 9.1 (Non Survival)*** of the Business Combination Agreement) shall each survive the termination of this Agreement pursuant to Section 5.1(a). For purposes of this Section 8, (x) "**Willful Breach"** means a material breach of this Agreement by a Party that is a consequence of an act undertaken or a failure to act by the breaching Party with the knowledge that the taking of such act or such failure to act would, or would reasonably be expected to, constitute or result in a breach of this Agreement and (y) "**Fraud**" means an act or omission by a Party, and requires: (a) a false or incorrect representation or warranty expressly set forth in this Agreement, (b) with actual knowledge (as opposed to constructive, imputed or implied knowledge) by the Party making such representation or warranty that such representation or warranty expressly set forth in this Agreement is false or incorrect, (c) an intention to deceive another Party, to induce him, her or it to enter into this Agreement, (d) another Party, in justifiable or reasonable reliance upon such false or incorrect representation or warranty expressly set forth in this Agreement, causing such Party to enter into this Agreement, and (e) another Party to suffer damage by reason of such reliance. For the avoidance of doubt, "Fraud" does not include any claim for equitable fraud, promissory fraud, unfair dealings fraud or any torts (including a claim for fraud or alleged fraud) based on negligence or recklessness.

5.4 Notices

All notices, requests, claims, demands and other communications hereunder shall be in writing and shall be given (and shall be deemed to have been duly given) by delivery in person, by e-mail (having obtained electronic delivery confirmation thereof), or by registered or certified mail (postage prepaid, return receipt requested) (upon receipt thereof) to the other Parties as follows:

(a) if to SOAC:

c/o Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141, Dallas, TX 75201

Attention: Scott Leonard; Gina Stryker
Email: scott.leonard@soa-corp.com; gina.stryker@soa-corp.com

with a copy (which shall not constitute notice) to:

Kirkland & Ellis LLP
609 Main Street
Houston, Texas 77002

Attention: Douglas E. Bacon, P.C.; Ryan Brissette
Email: doug.bacon@kirkland.com; ryan.brissette@kirkland.com

with a copy (which shall not constitute notice) to:

Stikeman Elliott LLP
1155 René-Lévesque Blvd. West 41st Floor
Montréal, Quebec H3B 3V2

Attention: Warren Katz
Email: wkatz@stikeman.com

(b) if to the Shareholder, at the address set forth on the Shareholder's signature page hereto.

or to such other address as the Party to whom notice is given may have previously furnished to the others in writing in the manner set forth above. Any demand, notice or other communication given by personal delivery will be conclusively deemed to have been given on the day of actual delivery thereof and, if given by electronic communication, on the day of transmittal thereof if given during the normal business hours of the recipient and on the Business Day during which such normal business hours next occur if not given during such hours on any day.

5.5 Benefit of Agreement

This Agreement shall be for the sole benefit of the Parties and their respective successors and permitted assigns and is not intended, nor shall be construed, to give any Person, other than the Parties and their respective successors and assigns, any legal or equitable right, benefit or remedy of any nature whatsoever by reason this Agreement. Nothing in this Agreement, expressed or implied, is intended to or shall constitute the Parties, partners or participants in a joint venture.

5.6 Non-Recourse

Except for claims pursuant to the Business Combination Agreement or any other Ancillary Document by any party(ies) thereto against any other party(ies) thereto on the terms and subject to the conditions therein, each Party agrees that (a) this Agreement may only be enforced against, and any action for breach of this Agreement may only be made against, the Parties, and no claims of any nature whatsoever (whether in tort, contract or otherwise) arising under or relating to this Agreement, the negotiation hereof or its subject matter, or the transactions contemplated hereby shall be asserted against any Company Non-Party Affiliate or any SOAC Non-Party Affiliate (other than the Shareholders named as parties hereto), and (b) no Company Non-Party Affiliate or SOAC Non-Party Affiliate (other than the Shareholders named as parties hereto), shall have any Liability arising out of or relating to this Agreement, the negotiation hereof or its subject matter, or the transactions contemplated hereby, including with

respect to any claim (whether in tort, contract or otherwise) for breach of this Agreement or in respect of any written or oral representations made or alleged to be made in connection herewith, or for any actual or alleged inaccuracies, misstatements or omissions with respect to any information or materials of any kind furnished in connection with this Agreement, the negotiation hereof or the transactions contemplated hereby.

5.7 Time

Time is of the essence of this Agreement. The mere lapse of time in the performance of the terms of this Agreement by any Party will have the effect of putting such Party in default.

5.8 Further Assurances

Subject to the provisions of this Agreement, the Parties will, from time to time, do all acts and things and execute and deliver all such further documents and instruments, as the other Parties may, reasonably require to effectively carry out or better evidence or perfect the full intent and meaning of this Agreement.

5.9 Governing Law

This Agreement shall be governed by, construed and enforced in accordance with, the laws of the Province of British Columbia and the federal laws of Canada applicable therein.

5.10 Incorporation by Reference

Sections 9.1 (Non-Survival), ***9.2 (Entire Agreement; Assignment)***, ***9.3 (Amendment)***, ***9.7 (Constructions; Interpretation)***, ***9.10 (Severability)***, ***9.11 (Counterparts; Electronic Signatures)***, ***Section 9.14 (Extension; Waiver)***, ***9.15 (Waiver of Jury Trial)***, ***9.16 (Submission to Jurisdiction)*** and ***9.17 (Remedies)*** of the Business Combination Agreement are incorporated herein and shall apply to this Agreement *mutatis mutandis*.

[The remainder of this page has been intentionally left blank.]

IN WITNESS OF WHICH the Parties have executed this Agreement.

SOAC:

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

By: _____

Name: _____

Title: _____

[Signature Page — Transaction Support Agreement]

IN WITNESS OF WHICH the Parties have executed this Agreement.

SHAREHOLDER:

Name of Registered Shareholder/Securityholder:

_____

By: _____

Name: _____

Title: _____

Company Securities:

[indicate the number of applicable Company Securities held]

_____ Company Common Shares

_____ Company Preferred Shares

_____ Company Options

_____ Company Warrants

Address for Notice:

Address:

_____

_____

_____

Telephone: _____

Email: _____

Facsimile: _____

[Signature Page — Transaction Support Agreement]

ANNEX G

SPONSOR LETTER AGREEMENT

This SPONSOR LETTER AGREEMENT (this "**Agreement**"), dated as of March 4, 2021, is made by and among Sustainable Opportunities Holdings LLC, a Delaware limited liability company (the "**Sponsor**"), all other holders of SOAC Class B Shares, as set forth on Schedule I hereto (the "**Other Class B Holders**", and together with the Sponsor, collectively, the "**Shareholders**"), Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company ("**SOAC**"), and DeepGreen Metals Inc., a corporation existing under the laws of British Columbia, Canada (the "**Company**"). The Sponsor, the Other Class B Holders, SOAC and the Company shall be referred to herein from time to time collectively as the "**Parties**". Capitalized terms used but not otherwise defined herein shall have the meanings ascribed to such terms in the Business Combination Agreement (as defined below).

WHEREAS, SOAC, the Company and certain other Persons party thereto entered into that certain Business Combination Agreement, dated as of the date hereof (as it may be amended, restated or otherwise modified from time to time in accordance with its terms, the "**Business Combination Agreement**"); and

WHEREAS, the Business Combination Agreement contemplates that the Parties will enter into this Agreement concurrently with the entry into the Business Combination Agreement by the parties thereto, pursuant to which, among other things, (a) the Shareholders agree that they will vote in favor of approval of the Business Combination Agreement and the transactions contemplated thereby (including the SOAC Continuance and the Transactions), (b) each Shareholder agrees, subject to and conditioned upon the Closing and effective as of immediately prior to the Effective Time, to waive any adjustment to the conversion ratio set forth in the Governing Documents of SOAC, including under Article 17 of the Amended and Restated Articles of Association of SOAC, or any other anti-dilution or similar protection with respect to all of the SOAC Class B Shares owned by him, her or it (whether in connection with the transactions contemplated by the Business Combination Agreement, the PIPE Subscription Agreements, or otherwise) and (c) the Sponsor agrees, subject to and conditioned upon the Closing and effective as of immediately following the SOAC Continuance, to exchange 741,000 SOAC Common Shares held by the Sponsor for Vesting Sponsor Shares (as defined herein) and the Sponsor Earnout Shares, in each case, on the terms and subject to the conditions of this Agreement and the exchange agreement in the form attached hereto as Exhibit A (the "**Exchange Agreement**").

NOW, THEREFORE, in consideration of the premises and the mutual promises contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, each intending to be legally bound, hereby agree as follows:

1. Agreement to Vote. Each Shareholder (on behalf of himself, herself and itself and not the other Shareholders) hereby irrevocably agrees, at any meeting of the shareholders of SOAC duly called and convened in accordance with the Governing Documents of SOAC, whether or not adjourned and however called, including at the SOAC Shareholders Meeting or otherwise, and in any action by written consent of the shareholders of SOAC, (i) to vote, or cause to be voted, or execute and return, or cause to be executed and returned, an action by written consent with respect to, as applicable, all of such Shareholder's SOAC Shares held of record or beneficially by such Shareholder as of the date of this Agreement, or to which such Shareholder acquires record or beneficial ownership after the date hereof and prior to the Closing (collectively, the "**Subject SOAC Equity Securities**") in favor of each of the Transaction Proposals, in each case, to the extent Subject SOAC Equity Securities are entitled to vote thereon or consent thereto, (ii) when such meeting is held, appear at such meeting or otherwise cause the Subject SOAC Equity Securities to be counted as present thereat for the purpose of establishing a quorum, and (iii) to vote, or cause to be voted against, against or withhold written consent, or cause written consent to be withheld, with respect to, as applicable, (A) any SOAC Acquisition Proposal or (B) any other matter, action or proposal that would reasonably be expected to result in (x) a breach of any of the SOAC Parties' covenants, agreements or obligations under the Business Combination Agreement or (y) any of the conditions to the Closing set forth in Sections 6.1, 6.2 or 6.3 of the Business Combination Agreement not being satisfied.

2. Waiver of Anti-dilution Protection. Each Shareholder hereby (a) waives, subject to and conditioned upon the Closing and effective as of immediately prior to the Effective Time (for himself, herself or itself and for his, her or its, successors, heirs and assigns), and (b) agrees not to assert or perfect, any rights to adjustment or other anti-dilution protections with respect to the rate that the SOAC Class B Shares held by him, her or it convert into

SOAC Class A Shares, including those set out in Article 17 of the Amended and Restated Articles of Association of SOAC, whether in connection with the transactions contemplated by the Business Combination Agreement, the PIPE Subscription Agreements or otherwise. SOAC hereby acknowledges and agrees to such waiver.

3. Transfer of Shares. Except as expressly contemplated by the Business Combination Agreement or with the prior written consent of the Company (such consent to be given or withheld in its sole discretion), from and after the date hereof, each Shareholder hereby agrees that he, she or it shall not (i) Transfer any of his, her or its Subject SOAC Equity Securities or any right, title or interest therein, (ii) enter into (A) any option, warrant, purchase right, or other Contract that could (either alone or in connection with one or more events, developments or events (including the satisfaction or waiver of any conditions precedent)) require such Shareholder to Transfer his, her or its Subject SOAC Equity Securities, or any right, title or interest therein or (B) any voting trust, proxy or other Contract with respect to the voting or Transfer of the Subject SOAC Equity Securities, or any right, title or interest therein, in a manner inconsistent with the covenants and obligations of this Agreement, or (iii) enter into any Contract to take, or cause to be taken, any of the actions set forth in clauses (i) or (ii); provided, however, that the foregoing shall not apply to any Transfer (1) to SOAC's officers or directors, any members or partners of the Sponsor, any affiliates of the Sponsor, or any employees of such affiliate; (2) in the case of an individual, by gift to a member of one of the individual's immediate family, to a trust, the beneficiary of which is a member of the individual's immediate family or an Affiliate of such individual; (3) in the case of an individual, by virtue of laws of descent and distribution upon death of the individual; (4) in the case of an individual, pursuant to a qualified domestic relations order; or (5) by virtue of the Sponsor's organizational documents upon liquidation or dissolution of the Sponsor (any transferee of the type set forth in clauses (1) through (5) a "**Permitted Transferee**"); provided, that the transferring Shareholder shall, and shall cause any Permitted Transferee, to enter into a written agreement in form and substance reasonably satisfactory to the Company, agreeing to be bound by this Agreement (which will include, for the avoidance of doubt, all of the covenants, agreements and obligations of the transferring Shareholder hereunder and the making of all applicable representations and warranties of the transferring Shareholder set forth in this Agreement with respect to such transferee and his, her or its Subject SOAC Equity Securities, or any right, title or interest therein received upon such Transfer, as applicable) prior and as a condition to the occurrence of such Transfer. For purposes of this Agreement, "**Transfer**" means any, direct or indirect, sale, transfer, assignment, pledge, mortgage, exchange, hypothecation, grant of a security interest or encumbrance in or disposition of an interest (whether with or without consideration, whether voluntarily or involuntarily or by operation of law or otherwise).

4. Vesting Sponsor Shares and Sponsor Earnout Shares.

a. The Sponsor and SOAC agree that, subject to and conditioned upon the Closing, immediately following the SOAC Continuance and immediately prior to the Effective Time, the Sponsor and SOAC shall enter into the Exchange Agreement pursuant to which 741,000 of the SOAC Common Shares (which, for the avoidance of doubt, shall consist of the SOAC Class B Shares prior to the SOAC Continuance) beneficially owned by the Sponsor shall be exchanged for 741,000 Class J Special Shares in the capital of SOAC (the "**Class J Conversion**"), convertible into SOAC Common Shares and redeemable in accordance with their terms (the "**Vesting Sponsor Shares**") and the Sponsor Earnout Shares. For the avoidance of doubt, any SOAC Common Shares beneficially owned by any Person other than the Sponsor, including the Other B Shareholders, and any SOAC Common Shares beneficially owned by the Sponsor, other than the 741,000 SOAC Common Shares described in the foregoing sentence, shall not be exchanged pursuant to this Section 4.a.

b. The Sponsor hereby acknowledges and agrees that, pursuant to the terms of the Business Combination Agreement, the SOAC Articles will, following the occurrence of the SOAC Continuance, provide, with respect to the Vesting Sponsor Shares, that if, (i) on any twenty (20) Trading Days within any thirty (30) Trading Day period the closing price of the SOAC Common Shares is greater than or equal to $12.00 or (ii) there occurs any transaction resulting in a Change of Control with a valuation of the SOAC Common Shares that is greater than or equal to $12.00 per SOAC Common Share, then all of the Vesting Sponsor Shares shall automatically be converted into SOAC Common Shares (the "**Automatic Conversion**"). If there occurs any transaction resulting in a Change of Control and the applicable valuation of the SOAC Common Shares is less than $12.00 per SOAC Common Share, then each outstanding Vesting Sponsor Share shall be redeemable by the Company, without any action or consent on the part of the Sponsor as set forth in the SOAC Articles.

c. SOAC shall take such actions as are reasonably requested by the Sponsor to evidence the issuances to or ownership by the Sponsor of SOAC Common Shares pursuant to this Section 4, including through the provision of an updated securities registry showing such issuances (as certified by an officer of SOAC responsible for maintaining such registry or the applicable registrar or transfer agent of SOAC).

d. In the event SOAC effects a subdivision or consolidation of the outstanding SOAC Common Shares into a greater or lesser number of SOAC Common Shares, then (i) the Vesting Sponsor Shares shall be subdivided or consolidated in the same manner and (ii) the dollar values set forth in Section 4.b above shall be appropriately amended to provide to the Sponsor the same economic effect as contemplated by this Agreement prior to such event.

e. So long as the Vesting Sponsor Shares are outstanding, SOAC shall take all reasonable efforts for SOAC to remain listed as a public company on, and for the SOAC Common Shares (including, for the avoidance of doubt, the SOAC Common Shares issuable upon conversion of the Vesting Sponsor Shares in accordance with this Section 4 to be tradeable over, the NYSE; provided, however, the foregoing shall not limit SOAC from consummating a Change of Control or entering into a Contract that contemplates a Change of Control. Subject to the terms hereof, upon the consummation of any Change of Control, other than as set forth in Section 4.b above, SOAC shall have no further obligations pursuant to this Section 4.e.

f. The Sponsor intends to make a protective election under Section 83(b) of the Code with respect to the receipt of the Vesting Sponsor Shares.

g. As a condition to the issuance of any Sponsor Earnout Shares or Vesting Sponsor Shares to a Shareholder, such Shareholder shall enter into an agreement with SOAC to provide, in respect of its ownership of such Sponsor Earnout Shares or Vesting Sponsor Shares, the same covenants, agreements and acknowledgements as will be contained in the Letter of Transmittal and provided by holders of other classes of Special Shares of SOAC to be issued at the Effective Time pursuant to the Transactions.

5. Other Agreements.

a. Each Shareholder hereby agrees that he, she or it shall (i) be bound by and subject to Sections 5.3(a) (Confidentiality and Access to Information) and 5.4(a) (Public Announcements) of the Business Combination Agreement to the same extent as such provisions apply to the parties to the Business Combination Agreement, as if such Shareholder is directly a party thereto, and (ii) not, directly or indirectly, take any action that SOAC is prohibited from taking pursuant to Section 5.6(a) (Exclusive Dealing) of the Business Combination Agreement.

b. Each Shareholder acknowledges and agrees that the Company is entering into the Business Combination Agreement in reliance upon each Shareholder entering into this Agreement and agreeing to be bound by, and perform, or otherwise comply with, as applicable, the agreements, covenants and obligations contained in this Agreement and but for each such Shareholder entering into this Agreement and agreeing to be bound by, and perform, or otherwise comply with, as applicable, the agreements, covenants and obligations contained in this Agreement, the Company would not have entered into or agreed to consummate the transactions contemplated by the Business Combination Agreement or the Ancillary Documents.

c. Each Shareholder hereby agrees that it shall not exercise or submit a request to exercise the SOAC Shareholder Redemption with respect to any SOAC Shares held by him, her or it.

d. Each Shareholder hereby agrees that it shall, at or prior to the Closing, deliver, or caused to be delivered, to the Company the Registration Rights Agreement duly executed by the Shareholder or, if applicable, an authorized officer of the Shareholder, dated as of the Closing Date.

6. Termination of Lock-up Period. Each of the Shareholders hereby agrees that subject to, and conditioned upon the occurrence and effective as of, the Closing, Section 5 of those certain Letter Agreements, dated May 8, 2020 (the "**Insider Letter Agreements**"), by and between SOAC and each of the Shareholders and certain other parties thereto, shall be amended and restated in its entirety as follows:

"5. Reserved."

The amendment and restatement of the Insider Letter Agreements set forth in this Section 6 shall be void and of no force and effect if the Business Combination Agreement is terminated in accordance with its terms.

7. Tax Treatment. The parties to this Agreement intend that, for U.S. federal and all applicable state and local income tax purposes, (1) each of the Class J Conversion and Automatic Conversion qualify as a "reorganization" within the meaning of Section 368(a)(1)(E) of the Code and (2) this Agreement be, and hereby adopt this Agreement as, a "plan of reorganization" within the meaning of Section 368 of the Code. The parties to this Agreement shall not take any position inconsistent with the intent set forth in this Section 7 except to the extent otherwise required by a "determination" as defined in Section 1313 of the Code. References in this Section 7 to the Code shall include references to any similar or analogous provisions of state or local Law.

8. Termination. This Agreement shall automatically terminate, without any notice or other action by any Party, and be void *ab initio* upon the earlier of (a) the Effective Time and (b) the termination of the Business Combination Agreement in accordance with its terms (except if such termination is made concurrently with the entering into of a definitive agreement in connection with an Alternative Transaction). Upon termination of this Agreement as provided in the immediately preceding sentence, none of the Parties shall have any further obligations or Liabilities under, or with respect to, this Agreement. Notwithstanding the foregoing or anything to the contrary in this Agreement, (i) the termination of this Agreement pursuant to Section 8(b) shall not affect any Liability on the part of any Party for a Willful Breach of any covenant or agreement set forth in this Agreement prior to such termination or Fraud, (ii) Section 5.a(i) (solely to the extent that it relates to Section 5.4(a) (Public Announcements) of the Business Combination Agreement), this Section 8 through Section 13 and Section 14 (to the extent related to any of the provisions that survive the termination of this Agreement) shall survive the termination of this Agreement pursuant to Section 8(a), and (iii) Section 5.a(i) (solely to the extent that it relates to Section 5.3(a) (Confidentiality and Access to Information) of the Business Combination Agreement), this Section 8 through Section 10, Section 12, Section 13 and Section 14 (to the extent related to any of the provisions that survive the termination of this Agreement and excluding Sections 9.1 (Non-Survival) of the Business Combination Agreement) shall survive the termination of this Agreement pursuant to Section 8(b). For purposes of this Section 8, (x) "**Willful Breach"** means a material breach of this Agreement by a Party that is a consequence of an act undertaken or a failure to act by the breaching Party with the knowledge that the taking of such act or such failure to act would, or would reasonably be expected to, constitute or result in a breach of this Agreement and (y) "**Fraud**" means an act or omission by a Party, and requires: (a) a false or incorrect representation or warranty expressly set forth in this Agreement, (b) with actual knowledge (as opposed to constructive, imputed or implied knowledge) by the Party making such representation or warranty that such representation or warranty expressly set forth in this Agreement is false or incorrect, (c) an intention to deceive another Party, to induce him, her or it to enter into this Agreement, (d) another Party, in justifiable or reasonable reliance upon such false or incorrect representation or warranty expressly set forth in this Agreement, causing such Party to enter into this Agreement, and (e) another Party to suffer damage by reason of such reliance. For the avoidance of doubt, "Fraud" does not include any claim for equitable fraud, promissory fraud, unfair dealings fraud or any torts (including a claim for fraud or alleged fraud) based on negligence or recklessness.

9. No Recourse. Except for claims pursuant to the Business Combination Agreement or any other Ancillary Document by any party(ies) thereto against any other party(ies) thereto on the terms and subject to the conditions therein, each Party agrees that (a) this Agreement may only be enforced against, and any action for breach of this Agreement may only be made against, the Parties, and no claims of any nature whatsoever (whether in tort, contract or otherwise) arising under or relating to this Agreement, the negotiation hereof or its subject matter, or the transactions contemplated hereby shall be asserted against any Company Non-Party Affiliate or any SOAC Non-Party Affiliate (other than the Shareholders named as parties hereto), and (b) no Company Non-Party Affiliate or SOAC Non-Party Affiliate (other than the Shareholders named as parties hereto), shall have any Liability arising out of or relating to this Agreement, the negotiation hereof or its subject matter, or the transactions contemplated hereby, including with respect to any claim (whether in tort, contract or otherwise) for breach of this Agreement or in respect of any written or oral representations made or alleged to be made in connection herewith, or for any actual or alleged inaccuracies, misstatements or omissions with respect to any information or materials of any kind furnished in connection with this Agreement, the negotiation hereof or the transactions contemplated hereby. Notwithstanding anything to the contrary in this Agreement, (i) in no event shall any Shareholder have any obligations or Liabilities related to or arising out of the covenants, agreements, obligations, representations or warranties of any other Shareholder under this Agreement (including related to or arising out of the breach of any such covenant, agreement, obligation, representation or warranty by any other Shareholder), (ii) in no event shall SOAC have any obligations or Liabilities related to or arising out of the covenants, agreements, obligations, representations or warrants of any Shareholder under this Agreement (including related to or arising out of any breach of any such covenant, agreement, obligation, representation or warranty by any such Shareholder).

10. Fiduciary Duties. Notwithstanding anything in this Agreement to the contrary, (a) each Shareholder makes no agreement or understanding herein in any capacity other than in such Shareholder's capacity as a record holder and/or beneficial owner of the Subject SOAC Equity Securities, and not, in the case of each Other Class B Shareholder in such Other Class B Shareholder's capacity as a director, officer or employee of any SOAC Party, and (b) nothing herein will be construed to limit or affect any action or inaction by each Other Class B Shareholder or any representative of the Sponsor serving as a member of the board of directors (or other similar governing body) of any SOAC Party or as an officer, employee or fiduciary of any SOAC Party, in each case, acting in such person's capacity as a director, officer, employee or fiduciary of such SOAC Party.

11. Expenses. In the event, the sum of (a) the SOAC Expenses, *plus* (b) the SOAC Liabilities exceeds $50 million at the Closing, not including any amounts set forth on Schedule II hereto, the Sponsor shall pay, or cause to be paid, to SOAC at the Closing out of immediately available funds to a bank account designated by the SOAC such excess amount (which, for the avoidance of doubt, shall not include any amounts set forth on Schedule II hereto) in United States Dollars.

12. No Third Party Beneficiaries. This Agreement shall be for the sole benefit of the Parties and their respective successors and permitted assigns and is not intended, nor shall be construed, to give any Person, other than the Parties and their respective successors and assigns, any legal or equitable right, benefit or remedy of any nature whatsoever by reason this Agreement. Nothing in this Agreement, expressed or implied, is intended to or shall constitute the Parties, partners or participants in a joint venture.

13. Notices. All notices, requests, claims, demands and other communications hereunder shall be in writing and shall be given (and shall be deemed to have been duly given) by delivery in person, by e-mail (having obtained electronic delivery confirmation thereof (i.e., an electronic record of the sender that the email was sent to the intended recipient thereof without an "error" or similar message that such email was not received by such intended recipient)), or by registered or certified mail (postage prepaid, return receipt requested) (upon receipt thereof) to the other Parties as follows:

If to any Shareholder, to:

c/o Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201
Attention: Scott Leonard
Gina Stryker
E-mail: scott.leonard@soa-corp.com
gina.stryker@soa-corp.com

with a copy (which shall not constitute notice) to:

Kirkland & Ellis LLP
609 Main Street
Houston, Texas 77002
Attention: Douglas E. Bacon, P.C.
Ryan Brissette
Email: doug.bacon@kirkland.com
ryan.brissette@kirkland.com

If to the Company, to:

DeepGreen Metals Inc.
595 Howe Street,
10th Floor
Vancouver, BC, V6C T25
Attention: Gerard Barron
E-mail: gerard@deep.green

with a copy (which shall not constitute notice) to

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
One Financial Center
Boston, MA 02111
Attention: Michael L. Fantozzi
E-mail: MLFantozzi@mintz.com

or to such other address as the Party to whom notice is given may have previously furnished to the others in writing in the manner set forth above.

14. Incorporation by Reference. Sections 9.1 (Non-Survival), 9.2 (Entire Agreement; Assignment). 9.3 (Amendment), 9.5 (Governing Law), 9.7 (Constructions; Interpretation), 9.10 (Severability), 9.11 (Counterparts; Electronic Signatures), 9.15 (Waiver of Jury Trial), 9.16 (Submission to Jurisdiction) and 9.17 (Remedies) of the Business Combination Agreement are incorporated herein and shall apply to this Agreement *mutatis mutandis*.

[Signature Page Follows]

IN WITNESS WHEREOF, each of the Parties has caused this Agreement to be duly executed on its behalf as of the day and year first above written.

SUSTAINABLE OPPORTUNITIES HOLDINGS LLC

By: /s/ Scott Honour

Name: Scott Honour

Title: Manager

[Signature Page to Sponsorship Letter Agreement]

DEEPGREEN METALS INC.

By: /s/ Gerard Barron
Name: Gerard Barron
Title: Chief Executive Officer

[Signature Page to Sponsorship Letter Agreement]

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

By: /s/ Scott Leonard
Name: Scott Leonard
Title: Chief Executive Officer

[Signature Page to Sponsorship Letter Agreement]

OTHER CLASS B SHAREHOLDER

/s/ Rick Gaenzle

Rick Gaenzle

[Signature Page to Sponsorship Letter Agreement]

OTHER CLASS B SHAREHOLDER

/s/ Isaac Barchas

Isaac Barchas

[Signature Page to Sponsorship Letter Agreement]

OTHER CLASS B SHAREHOLDER

/s/ Justin Kelly

Justin Kelly

[Signature Page to Sponsorship Letter Agreement]

EXHIBIT A

Form of Exchange Agreement

Attached.

SCHEDULE I

Other Class B Holders

1. Rick Gaenzle
2. Isaac Barchas
3. Justin Kelly

ANNEX H

AMENDED AND RESTATED REGISTRATION RIGHTS AGREEMENT

THIS AMENDED AND RESTATED REGISTRATION RIGHTS AGREEMENT (this "**Agreement**"), dated as of [•], 2021, is made and entered into by and among [•] (f/k/a Sustainable Opportunities Acquisition Corp.), a company existing under the laws of British Columbia, Canada (the "**Company**"), Sustainable Opportunities Holdings LLC, a Delaware limited liability company (the "**Sponsor**"), the undersigned parties listed under Sponsor Group Holders on the signature page(s) hereto (each such party, a "**Sponsor Group Holder**" and, collectively, the "**Sponsor Group Holders**"), and the undersigned parties listed under DeepGreen Holders on the signature page(s) hereto (each such party, a "**DeepGreen Holder**" and, collectively, the "**DeepGreen Holders**"). The Sponsor Group Holders, the DeepGreen Holders and any person or entity who hereafter becomes a party to this Agreement pursuant to Section 5.2 of this Agreement, are each referred to herein as a "**Holder**" and collectively as the "**Holders**."

RECITALS

WHEREAS, the Company has entered into that certain Business Combination Agreement (the "**Business Combination Agreement**"), dated as of March 4, 2021, by and among the Company, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada, and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada;

WHEREAS, pursuant to the transactions contemplated by the Business Combination Agreement, the DeepGreen Holders received (i) common shares ("**Common Shares**") of the Company (the "**DeepGreen Shares**"), and (ii) the DeepGreen Earnout Securities (as defined below) upon the closing of such transactions (the "**Closing**");

WHEREAS, the Existing Parties (as defined below) collectively hold an aggregate of 6,759,000 Common Shares (the "**Founder Shares**"), which Common Shares were automatically converted from 6,759,000 Company's Class B ordinary shares, par value $0.0001 per share, held by the Existing Parties prior to the Closing;

WHEREAS, pursuant to the transactions contemplated by the Business Combination Agreement and subject to the terms and conditions set forth therein, the Sponsor received the Sponsor Earnout Securities (as defined below) at the Closing;

WHEREAS, the Company and the Sponsor are party to that certain Private Placement Warrants Purchase Agreement, dated May 5, 2020, pursuant to which the Sponsor purchased 9,500,000 warrants (the "**Private Placement Warrants**") in private placement transactions occurring simultaneously with the closing of the Company's initial public offering, and the Sponsor or an affiliate of the Sponsor or any of the Company's officers or directors may, but are not obligated to, loan the Company funds for certain purposes, of which up to $1,500,000 of such loans may be convertible into an additional 1,500,000 Private Placement Warrants (the "**Working Capital Warrants**");

WHEREAS, the Company has entered into separate Subscription Agreements (the "**Subscription Agreements**") with the subscribers identified therein (the "**PIPE Investors**"), pursuant to which (i) the PIPE Investors purchased an aggregate of 33,000,000 Common Shares (the "**PIPE Shares**") in a private placement transaction that closed substantially concurrently with and immediately prior to the Closing, and (ii) the PIPE Investors were granted certain registration rights with respect to the PIPE Shares;

WHEREAS, on March 4, 2021, the Company issued to Allseas Group S.A. a warrant to purchase up to 10,000,000 shares of Common Stock, subject to certain vesting and other conditions described therein (the "**Allseas Warrant**");

WHEREAS, the Company, the Sponsor and certain of the Sponsor Group Holders (the Sponsor and such Sponsor Group Holders being collectively referred to herein as the "**Existing Parties**") are party to that certain Registration and Shareholder Rights Agreement dated May 8, 2020 (the "**Existing Registration Rights Agreement**"), pursuant to which, among other matters, such Existing Parties were granted certain registration rights with respect to the Company securities then held by the Existing Parties;

WHEREAS, pursuant to Section 6.8 of the Existing Registration Rights Agreement, the provisions, covenants and conditions set forth therein may be waived, amended or modified upon the written consent of the Company and the Existing Parties holding a majority-in-interest of the "Registrable Securities" (as such term was defined in the Existing Registration Rights Agreement) at the time in question; and

WHEREAS, the Company and all of the Existing Parties desire to amend and restate the Existing Registration Rights Agreement in order to provide the Sponsor Group Holders and the DeepGreen Holders certain registration rights, as set forth in this Agreement.

NOW, **THEREFORE**, in consideration of the representations, covenants and agreements contained herein, and certain other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree as follows:

ARTICLE I

DEFINITIONS

1.1 Definitions. The terms defined in this Article I shall, for all purposes of this Agreement, have the respective meanings set forth below:

"**Adverse Disclosure**" shall mean any public disclosure of material non-public information, which disclosure, in the good faith judgment of the principal executive officer or principal financial officer of the Company, after consultation with counsel to the Company, (i) would be required to be made in any Registration Statement or Prospectus in order for the applicable Registration Statement or Prospectus not to contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements contained therein (in the case of any Prospectus and any preliminary Prospectus, in the light of the circumstances under which they were made) not misleading, (ii) would not be required to be made at such time if the Registration Statement were not being filed, and (iii) the Company has a bona fide business purpose for not making such information public.

"**Agreement**" shall have the meaning given in the Preamble.

"**Allseas Warrant**" shall have the meaning given in the Recitals hereto.

"**Board**" shall mean the Board of Directors of the Company.

"**Business Combination Agreement**" shall have the meaning given in the Recitals hereto.

"**Commission**" shall mean the U.S. Securities and Exchange Commission.

"**Common Shares**" shall have the meaning given in the Recitals hereto.

"**Company**" shall have the meaning given in the Preamble.

"**Company Shelf Takedown Notice**" shall have the meaning given in subsection 2.1.3.

"**DeepGreen Earnout Securities**" means (i) 5,000,000 Class A Special Shares, (ii) 10,000,000 Class B Special Shares, (iii) 10,000,000 Class C Special Shares, (iv) 20,000,000 Class D Special Shares, (v) 20,000,000 Class E Special Shares, (vi) 20,000,000 Class F Special Shares, (vii) 25,000,000 Class G Special Shares, and (viii) 25,000,000 Class H Special Shares, in each case, in the capital of the Company.

"**DeepGreen Earnout Shares**" means the Common Shares underlying the DeepGreen Earnout Securities.

"**DeepGreen Holders**" shall have the meaning given in the Preamble.

"**DeepGreen Lock-up Periods**" shall have the meaning given in subsection 3.7.

"**DeepGreen Management Lock-up Period**" shall mean, with respect to the DeepGreen Shares listed on *Schedule A* hereto,[1] the period ending on the earlier of (A) 540 days after the Closing and (B) the date on which (x) the Common Shares has traded at a price that is greater than or equal to $12.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) during any 20 trading days within any 30 consecutive trading day period after the Closing or (y) the Company completes a liquidation, merger, stock exchange, reorganization or other similar transaction that results in all of the Company's public stockholders having the right to exchange their shares of Common Shares for cash, securities or other property.

"**DeepGreen Shares**" shall have the meaning given in the Recitals hereto.

"**DeepGreen Shares Lock-up Period**" shall mean, with respect to the DeepGreen Shares listed on *Schedule B* hereto[2], the period ending on the earlier of (A) 180 days after the Closing and (B) the date on which (x) the Common Shares has traded at a price that is greater than or equal to $12.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) during any 20 trading days within any 30 consecutive trading days after the Closing or (y) the Company completes a liquidation, merger, stock exchange, reorganization or other similar transaction that results in all of the Company's public stockholders having the right to exchange their Common Shares for cash, securities or other property.

"**Demand Registration**" shall have the meaning given in subsection 2.2.1.

"**Demanding Holders**" shall have the meaning given in subsection 2.2.1.

"**Effectiveness Deadline**" shall have the meaning given in subsection 2.1.1.

"**Exchange Act**" shall mean the Securities Exchange Act of 1934, as it may be amended from time to time.

"**Existing Parties**" shall have the meaning given in the Recitals hereto.

"**Existing Registration Rights Agreement**" shall have the meaning given in the Recitals hereto.

"**Form S-1**" shall have the meaning given in subsection 2.1.1.

"**Form S-3**" shall have the meaning given in subsection 2.1.2.

"**Founder Lock-up Periods**" shall have the meaning given in subsection 3.7.

"**Founder Shares**" shall have the meaning given in the Recitals hereto.

"**Founder Shares Six-Month Lock-up Period**" shall mean, with respect to the securities listed on *Schedule C* hereto[3], the period ending on the earlier of (A) 180 days after the Closing and (B) the date on which (x) the Common Shares has traded at a price that is greater than or equal to $12.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) during any 20 trading days within any 30 consecutive trading days after the Closing, or (y) the Company completes a liquidation, merger, stock exchange, reorganization or other similar transaction that results in all of the Company's public stockholders having the right to exchange their Common Shares for cash, securities or other property.

"**Founder Shares Twelve-Month Lock-up Period**" shall mean, with respect to the securities listed on *Schedule D* hereto[4], the period ending on the earlier of (A) 360 days after the Closing and (B) the date on which (x) the Common Shares has traded at a price that is greater than or equal to $12.00 per share

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1 Note: Schedule A shall include an aggregate of 10% of the DeepGreen Shares held by certain members of DeepGreen management.

2 Note: Schedule B shall include Deep Green Shares (other than the DeepGreen Management Shares) held by DeepGreen Holders holding in excess of one percent (1%) of the total number of shares of DeepGreen issued and outstanding immediately prior to the Closing.

3 Note: Schedule C shall include securities equal to 50% of all shares, warrants and underlying shares held by the Sponsor and its affiliates, and directors of SOAC.

4 Note: Schedule D shall include securities equal to 50% of all shares, warrants and underlying shares held by the Sponsor and its affiliates, and directors of SOAC.

(as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) during any 20 trading days within any 30 consecutive trading days commencing at least 150 days after the Closing; provided that all of the DeepGreen Shares have been registered on an effective Registration Statement filed pursuant to subsection 2.1.1, or (y) the completion by the Company of a liquidation, merger, stock exchange, reorganization or other similar transaction that results in all of the Company's public stockholders having the right to exchange their Common Shares for cash, securities or other property.

"**Holders**" shall have the meaning given in the Preamble.

"**Insider Letter**" shall mean that certain letter agreement, dated as of May 8, 2020, by and among the Company and the Sponsor, as in effect immediately prior to the Closing.

"**Maximum Number of Securities**" shall have the meaning given in subsection 2.2.4.

"**Misstatement**" shall mean an untrue statement of a material fact or an omission to state a material fact required to be stated in a Registration Statement or Prospectus or necessary to make the statements in a Registration Statement or Prospectus (in the case of any Prospectus, in the light of the circumstances under which they were made) not misleading.

"**Lock-up Periods**" shall mean the Founder Shares Six-Month Lock-up Period, the Founder Shares Twelve-Month Lock-up Period, the DeepGreen Shares Lock-up Period, and the DeepGreen Management Lock-Up Period.

"**Permitted Transferees**" shall mean a person or entity to whom a Holder of Registrable Securities is or was permitted to transfer such Registrable Securities prior to the expiration of any applicable lock-up period, under the Insider Letter, this Agreement or any other applicable agreement between such Holder and the Company and to any transferee thereafter.

"**Piggyback Registration**" shall have the meaning given in subsection 2.3.1.

"**PIPE Investors**" shall have the meaning given in the Recitals hereto.

"**PIPE Shares**" shall have the meaning given in the Recitals hereto.

"**Private Placement Warrants**" shall have the meaning given in the Recitals hereto.

"**Prospectus**" shall mean the prospectus included in any Registration Statement, as supplemented by any and all prospectus supplements and as amended by any and all post-effective amendments and including all material incorporated by reference in such prospectus.

"**Registrable Security**" shall mean (a) the Founder Shares, (b) the Private Placement Warrants, (c) the DeepGreen Shares, (d) the DeepGreen Earnout Shares, (e) the Sponsor Earnout Shares, (f) the Common Shares issued or issuable upon the exercise of any Private Placement Warrants, (g) the Working Capital Warrants (including any Ordinary Shares issued or issuable upon the conversion of working capital loans), (h) the Common Shares issued or issuable upon the exercise of the Allseas Warrant; (i) any outstanding Common Shares or any other equity security (including the Common Shares issued or issuable upon the exercise or conversion of any other equity security) of the Company held by a Holder as of immediately following the Closing, (j) any Common Shares issued or issuable upon the exercise of any Working Capital Warrants, (k) any Common Shares held by unitholders or members of the board of managers of the Sponsor immediately prior to the Closing, and (l) any other equity security of the Company issued or issuable with respect to any such Common Shares by way of a stock dividend or stock split or in connection with a combination of shares, recapitalization, merger, consolidation or reorganization; provided, however, that, as to any particular Registrable Security, such securities shall cease to be Registrable Securities when: (A) a Registration Statement with respect to the sale of such securities shall have become effective under the Securities Act and such securities shall have been sold, transferred, disposed of or exchanged in accordance with such Registration Statement; (B) such securities shall have been otherwise transferred, new certificates for such securities not bearing a legend restricting further transfer shall have been delivered by the Company and subsequent public distribution of such securities shall not require registration under the Securities Act; (C) such securities shall have ceased to be outstanding; (D) such securities may be sold without volume or

manner of sale restrictions pursuant to Rule 144 promulgated under the Securities Act; or (E) such securities have been sold to, or through, a broker, dealer or underwriter in a public distribution or other public securities transaction.

"**Registration**" shall mean a registration effected by preparing and filing a registration statement or similar document in compliance with the requirements of the Securities Act, and the applicable rules and regulations promulgated thereunder, and such registration statement becoming effective.

"**Registration Expenses**" shall mean the out-of-pocket expenses of a Registration, including, without limitation, the following:

(A) all registration and filing fees (including fees with respect to filings required to be made with the Financial Industry Regulatory Authority, Inc.) and any securities exchange on which the Common Shares is then listed;

(B) fees and expenses of compliance with securities or blue sky laws (including reasonable fees and disbursements of counsel for the Underwriters in connection with blue sky qualifications of Registrable Securities);

(C) printing, messenger, telephone and delivery expenses;

(D) reasonable fees and disbursements of counsel for the Company;

(E) reasonable fees and disbursements of all independent registered public accountants of the Company incurred specifically in connection with such Registration; and

(F) reasonable fees and expenses of one (1) legal counsel selected by the majority-in-interest of the Demanding Holders initiating a Demand Registration to be registered for offer and sale in the applicable Registration.

"**Registration Statement**" shall mean any registration statement that covers the Registrable Securities pursuant to the provisions of this Agreement, including the Prospectus included in such registration statement, amendments (including post-effective amendments) and supplements to such registration statement, and all exhibits to and all material incorporated by reference in such registration statement.

"**Requesting Holder**" shall have the meaning given in subsection 2.2.1.

"**Restricted Securities**" shall have the meaning given in subsection 3.7.

"**Rule 415**" shall have the meaning given in subsection 2.1.1.

"**Securities Act**" shall mean the Securities Act of 1933, as amended from time to time.

"**Shelf Takedown Notice**" shall have the meaning given in subsection 2.1.3.

"**Shelf Underwritten Offering**" shall have the meaning given in subsection 2.1.3.

"**Sponsor**" shall have the meaning given in the Preamble.

"**Sponsor Earnout Securities**" means (i) 500,000 Class I Special Shares and (ii) 741,000 Class J Special Shares, in each case in the capital of the Company.

"**Sponsor Earnout Shares**" means the Common Shares underlying the Sponsor Earnout Securities.

"**Sponsor Group Holders**" shall have the meaning given in the Preamble.

"**Subscription Agreements**" shall have the meaning given in the Recitals hereto.

"**Underwriter**" shall mean a securities dealer who purchases any Registrable Securities as principal in an Underwritten Offering and not as part of such dealer's market-making activities.

"**Underwritten Registration**" or "**Underwritten Offering**" shall mean a Registration in which securities of the Company are sold to an Underwriter in a firm commitment underwriting for distribution to the public.

"**Working Capital Warrants**" shall have the meaning given in the Recitals hereto.

ARTICLE II

REGISTRATIONS

2.1 Initial Registration; Shelf Takedown.

2.1.1 Initial Registration. The Company shall use its commercially reasonable efforts to file a Registration Statement under the Securities Act promptly, but in any event within thirty (30) days following the Closing, to permit the public resale of all the Registrable Securities (including the DeepGreen Earnout Shares and the Sponsor Earnout Shares, whether or not outstanding on the date of such filing) held by the Holders from time to time as permitted by Rule 415 under the Securities Act (or any successor or similar provision adopted by the Commission then in effect) ("**Rule 415**") on the terms and conditions specified in this subsection 2.1.1 and shall use its commercially reasonable efforts to cause such Registration Statement to be declared effective as soon as practicable after the filing thereof, but in no event later than forty-five (45) days following the filing deadline (the "**Effectiveness Deadline**"); provided, that the Effectiveness Deadline shall be extended to seventy-five (75) days after the filing deadline if the Registration Statement is reviewed by, and receives comments from, the Commission. The Registration Statement filed with the Commission pursuant to this subsection 2.1.1 shall be a registration statement on Form S-1 (a "**Form S-1**") or such other form of registration statement as is then available to effect a registration for resale of such Registrable Securities, covering such Registrable Securities, and shall contain a Prospectus in such form as to permit any Holder to sell such Registrable Securities pursuant to Rule 415 at any time beginning on the effective date for such Registration Statement. A Registration Statement filed pursuant to this subsection 2.1.1 shall provide for the resale pursuant to any method or combination of methods legally available to, and requested by, the Holders. The Company shall use its commercially reasonable efforts to cause a Registration Statement filed pursuant to this subsection 2.1.1 to remain effective, and to be supplemented and amended to the extent necessary to ensure that such Registration Statement is available or, if not available, that another Registration Statement is available, for the resale of all the Registrable Securities held by the Holders until all such Registrable Securities have ceased to be Registrable Securities. As soon as practicable following the effective date of a Registration Statement filed pursuant to this subsection 2.1.1, but in any event within two (2) business days of such date, the Company shall notify the Holders of the effectiveness of such Registration Statement. When effective, a Registration Statement filed pursuant to this subsection 2.1.1 (including the documents incorporated therein by reference) will comply as to form in all material respects with all applicable requirements of the Securities Act and the Exchange Act and will not contain a Misstatement.

2.1.2 Form S-3. The Company shall use its commercially reasonable efforts to convert the Registration Statement filed pursuant to subsection 2.1.1 to a Form S-3 ("**Form S-3**") as soon as practicable after the Company is eligible to use Form S-3.

2.1.3 Shelf Takedown. At any time and from time to time following the effectiveness of the shelf registration statement required by subsection 2.1.1 or 2.1.2, any Holder(s) may request to sell all or a portion of their outstanding Registrable Securities in an Underwritten Offering that is registered pursuant to such shelf registration statement (a "**Shelf Underwritten Offering**") provided that such Holder(s) (a) reasonably expect aggregate gross proceeds in excess of $40,000,000 from such Shelf Underwritten Offering or (b) reasonably expects to sell all of the Registrable Securities held by such Holder in such Shelf Underwritten Offering but in no event for less than $10,000,000 in gross proceeds. All requests for a Shelf Underwritten Offering shall be made by giving written notice to the Company (the "**Shelf Takedown Notice**"). Each Shelf Takedown Notice shall specify the approximate number of Registrable Securities proposed to be sold in the Shelf Underwritten Offering and the expected price range (net of underwriting discounts and commissions) of such Shelf Underwritten Offering. Within ten (10) business days after receipt of any Shelf Takedown Notice, the Company shall give written notice of such requested Shelf Underwritten Offering to all other Holders of Registrable Securities (the "**Company Shelf Takedown Notice**") and, subject to reductions consistent with the pro rata calculations in subsection 2.2.4, shall include in such Shelf Underwritten Offering all outstanding Registrable Securities with respect to which the Company has received written requests

for inclusion therein, within five (5) days after sending the Company Shelf Takedown Notice. The Company shall enter into an underwriting agreement in a form as is customary in Underwritten Offerings of securities by the Company with the managing Underwriter or Underwriters selected by the initiating Holder(s) after consultation with the Company and shall take all such other reasonable actions as are requested by the managing Underwriter or Underwriters in order to expedite or facilitate the disposition of such Registrable Securities. In connection with any Shelf Underwritten Offering contemplated by this subsection 2.1.3, subject to Section 3.4 and Article IV, the underwriting agreement into which each Holder and the Company shall enter shall contain such representations, covenants, indemnities and other rights and obligations of the Company and the selling stockholders as are customary in Underwritten Offerings of securities by the Company.

2.2 Demand Registration.

2.2.1 Request for Registration. Subject to the provisions of subsection 2.2.4 hereof and provided that the Company does not have an effective Registration Statement pursuant to subsection 2.1 outstanding covering the Registrable Securities subject to the applicable Demand Registration, the Holders of at least a majority-in-interest of the then outstanding number of Registrable Securities held by the DeepGreen Holders or the Sponsor Group Holders (the "**Demanding Holders**"), in each case, may make a written demand for Registration of all or part of their Registrable Securities, which written demand shall describe the amount and type of securities to be included in such Registration and the intended method(s) of distribution thereof (such written demand a "**Demand Registration**"). The Company shall, within five (5) days of the Company's receipt of the Demand Registration, notify, in writing, all other Holders of Registrable Securities of such demand, and each Holder of Registrable Securities who thereafter wishes to include all or a portion of such Holder's Registrable Securities in a Registration pursuant to a Demand Registration (each such Holder that includes all or a portion of such Holder's Registrable Securities in such Registration, a "**Requesting Holder**") shall so notify the Company, in writing, within five (5) days after the receipt by the Holder of the notice from the Company. Upon receipt by the Company of any such written notification from a Requesting Holder(s) to the Company, such Requesting Holder(s) shall be entitled to have their Registrable Securities included in a Registration pursuant to a Demand Registration and the Company shall effect, as soon thereafter as practicable, the Registration of all Registrable Securities requested by the Demanding Holders and Requesting Holders pursuant to such Demand Registration, including by filing a Registration Statement relating thereto as soon as practicable, but not more than forty-five (45) days immediately after the Company's receipt of the Demand Registration. Under no circumstances shall the Company be obligated to effect more than an aggregate of two (2) Registrations pursuant to a Demand Registration initiated by the DeepGreen Holders and two (2) Registrations pursuant to a Demand Registration initiated by the Sponsor Group Holders under this subsection 2.1.1 with respect to any or all Registrable Securities; provided, however, that a Registration pursuant to a Demand Registration shall not be counted for such purposes unless a Registration Statement with respect to such Demand Registration has become effective and all of the Registrable Securities requested by the Requesting Holders and the Demanding Holders to be registered on behalf of the Requesting Holders and the Demanding Holders on such Registration Statement have been sold, in accordance with Section 3.1 of this Agreement; provided, further, that an Underwritten Shelf Takedown shall not count as a Demand Registration.

2.2.2 Effective Registration. Notwithstanding the provisions of subsection 2.2.1 above or any other part of this Agreement, a Registration pursuant to a Demand Registration shall not count as a Registration unless and until (i) the Registration Statement filed with the Commission with respect to a Registration pursuant to a Demand Registration has been declared effective by the Commission and (ii) the Company has complied with all of its material obligations under this Agreement with respect thereto; provided, further, that if, after such Registration Statement has been declared effective, an offering of Registrable Securities in a Registration pursuant to a Demand Registration is subsequently interfered with by any stop order or injunction of the Commission, federal or state court or any other governmental agency, the Registration Statement with respect to such Registration shall be deemed not to have been declared effective, unless and until, (i) such stop order or injunction is removed, rescinded or otherwise terminated, and (ii) a majority-in-interest of the Demanding Holders initiating such Demand Registration thereafter affirmatively elect to continue with such Registration and accordingly notify the Company in writing, but in no event later than five (5) days, of such election; provided, further, that the Company shall not be obligated or required to file another Registration Statement until the Registration Statement that has been previously filed with respect to a Registration pursuant to a Demand Registration becomes effective or is subsequently terminated.

2.2.3 Underwritten Offering. Subject to the provisions of subsection 2.2.4 hereof, if a majority-in-interest of the Demanding Holders so advise the Company as part of their Demand Registration that the offering of the Registrable Securities pursuant to such Demand Registration shall be in the form of an Underwritten Offering, then the right of such Demanding Holder or Requesting Holder (if any) to include its Registrable Securities in such Registration shall be conditioned upon such Holder's participation in such Underwritten Offering and the inclusion of such Holder's Registrable Securities in such Underwritten Offering to the extent provided herein. All such Holders proposing to distribute their Registrable Securities through an Underwritten Offering under this subsection 2.2.3 shall enter into an underwriting agreement in customary form with the Underwriter(s) selected for such Underwritten Offering by the majority in interest of the Demanding Holders initiating the Demand Registration, which Underwriter(s) shall be reasonably satisfactory to the Company.

2.2.4 Reduction of Underwritten Offering. If the managing Underwriter or Underwriters in an Underwritten Registration pursuant to a Demand Registration, in good faith, advises the Company, the Demanding Holders and the Requesting Holders (if any) in writing that the dollar amount or number of Registrable Securities that the Demanding Holders and the Requesting Holders (if any) desire to sell, taken together with all other Common Shares or other equity securities that the Company desires to sell and the Common Shares, if any, as to which a Registration has been requested pursuant to separate written contractual piggyback registration rights held by any other stockholders who desire to sell, exceeds the maximum dollar amount or maximum number of equity securities that can be sold in the Underwritten Offering without adversely affecting the proposed offering price, the timing, the distribution method, or the probability of success of such offering (such maximum dollar amount or maximum number of such securities, as applicable, the "**Maximum Number of Securities**"), then the Company shall include in such Underwritten Offering, as follows: (i) first, the Registrable Securities of the Demanding Holders (pro rata based on the respective number of Registrable Securities that each Demanding Holder has requested be included in such Underwritten Registration and the aggregate number of Registrable Securities that the Demanding Holders have requested be included in such Underwritten Registration) that can be sold without exceeding the Maximum Number of Securities; (ii) second, the Registrable Securities of the Requesting Holders (pro rata based on the number of Registrable Securities that each Requesting Holder has requested to be included in such Underwritten Registration and the aggregate number of Registrable Securities that the Requesting Holders have requested be included in such Underwritten registration) that can be sold without exceeding the Maximum Number of Securities; (iii) third, to the extent that the Maximum Number of Securities has not been reached under the foregoing clauses (i)-(ii), the Registrable Securities of Holders (pro rata, based on the respective number of Registrable Securities that each Holder has so requested) exercising their rights to register their Registrable Securities pursuant to subsection 2.3.1 hereof, without exceeding the Maximum Number of Securities; and (iv) fourth, to the extent that the Maximum Number of Securities has not been reached under the foregoing clauses (i)-(iii), the Common Shares or other equity securities that the Company desires to sell, which can be sold without exceeding the Maximum Number of Securities; and (v) fifth, to the extent that the Maximum Number of Securities has not been reached under the foregoing clauses (i)-(iv), the Common Shares or other equity securities of other persons or entities that the Company is obligated to register in a Registration pursuant to separate written contractual arrangements with such persons and that can be sold without exceeding the Maximum Number of Securities.

2.2.5 Demand Registration Withdrawal. A majority-in-interest of the Demanding Holders initiating a Demand Registration or a majority-in-interest of the Requesting Holders (if any), pursuant to a Registration under subsection 2.2.1 shall have the right to withdraw from a Registration pursuant to such Demand Registration or a Shelf Underwritten Offering pursuant to subsection 2.1.3 for any or no reason whatsoever upon written notification to the Company and the Underwriter or Underwriters (if any) of their intention to withdraw from such Registration at least two (2) business days prior to the effectiveness of the Registration Statement filed with the Commission with respect to the Registration of their Registrable Securities pursuant to such Demand Registration (or in the case of an Underwritten Registration pursuant to Section 2.1.1 or 2.2.4 at least five (5) business days prior to the time of pricing of the applicable offering). Notwithstanding anything to the contrary in this Agreement, the Company shall be responsible for the Registration Expenses incurred in connection with a Registration pursuant to a Demand Registration prior to its withdrawal under this subsection 2.2.5.

2.3 Piggyback Registration.

2.3.1 Piggyback Rights. If the Company proposes to file a Registration Statement under the Securities Act with respect to an offering of equity securities, or securities or other obligations exercisable or exchangeable for, or convertible into equity securities, for its own account or for the account of stockholders of the

Company (or by the Company and by the stockholders of the Company including, without limitation, pursuant to Sections 2.1 and 2.2 hereof), other than a Registration Statement (i) filed in connection with any employee stock option or other benefit plan, (ii) for a rights offering or an exchange offer or offering of securities solely to the Company's then existing stockholders, (iii) for an offering of debt that is convertible into equity securities of the Company or (iv) for a dividend reinvestment plan, then the Company shall give written notice of such proposed filing to all of the Holders of Registrable Securities as soon as practicable but not less than ten (10) days before the anticipated filing date of such Registration Statement, which notice shall (A) describe the amount and type of securities to be included in such offering, the intended method(s) of distribution, and the name of the proposed managing Underwriter or Underwriters, if any, in such offering, and (B) offer to all of the Holders of Registrable Securities the opportunity to register the sale of such number of Registrable Securities as such Holders may request in writing within five (5) days after receipt of such written notice (such Registration a "**Piggyback Registration**"). The Company shall, in good faith, cause such Registrable Securities to be included in such Piggyback Registration and shall use its commercially reasonable efforts to cause the managing Underwriter or Underwriters of a proposed Underwritten Offering to permit the Registrable Securities requested by the Holders pursuant to this subsection 2.3.1 to be included in a Piggyback Registration on the same terms and conditions as any similar securities of the Company included in such Registration and to permit the sale or other disposition of such Registrable Securities in accordance with the intended method(s) of distribution thereof. All such Holders proposing to distribute their Registrable Securities through an Underwritten Offering under this subsection 2.3.1 shall enter into an underwriting agreement in customary form with the Underwriter(s) selected for such Underwritten Offering by the Company. The Holders agree that, except as required by applicable law, the Holders shall treat as confidential any notice or other communication in connection with any Piggyback Registration and shall not disclose or use the information contained in such notice without the prior written consent of the Company until such time as the information contained therein is or becomes public, other than as a result of disclosure by a Holder of Registrable Shares in breach of the terms of this Agreement.

2.3.2 Reduction of Piggyback Registration. If the managing Underwriter or Underwriters in an Underwritten Registration that is to be a Piggyback Registration, in good faith, advises the Company and the Holders of Registrable Securities participating in the Piggyback Registration in writing that the dollar amount or number of the Common Shares that the Company desires to sell, taken together with (i) the Common Shares, if any, as to which Registration has been demanded pursuant to separate written contractual arrangements with persons or entities other than the Holders of Registrable Securities hereunder, (ii) the Registrable Securities as to which registration has been requested pursuant to Section 2.3 hereof, and (iii) the Common Shares, if any, as to which Registration has been requested pursuant to separate written contractual piggyback registration rights of other stockholders of the Company, exceeds the Maximum Number of Securities, then:

If the Registration is undertaken for the Company's account, the Company shall include in any such Registration (A) first, the Common Shares or other equity securities that the Company desires to sell, which can be sold without exceeding the Maximum Number of Securities; (B) second, to the extent that the Maximum Number of Securities has not been reached under the foregoing clause (A), the Registrable Securities of the Holders exercising their rights to register their Registrable Securities pursuant to subsection 2.3.1 hereof, pro rata, based on the respective number of Registrable Securities that each Holder has so requested, which can be sold without exceeding the Maximum Number of Securities; and (C) third, to the extent that the Maximum Number of Securities has not been reached under the foregoing clauses (A) and (B), the Common Shares, if any, as to which Registration has been requested pursuant to written contractual piggyback registration rights of other stockholders of the Company, which can be sold without exceeding the Maximum Number of Securities;

If the Registration is pursuant to a request by persons or entities other than the Holders of Registrable Securities, then the Company shall include in any such Registration (A) first, the Common Shares or other equity securities, if any, of such requesting persons or entities, other than the Holders of Registrable Securities, which can be sold without exceeding the Maximum Number of Securities; (B) second, to the extent that the Maximum Number of Securities has not been reached under the foregoing clause (A), the Registrable Securities of Holders exercising their rights to register their Registrable Securities pursuant to subsection 2.3.1, pro rata, based on the respective number of Registrable Securities that each Holder has requested be included in such Underwritten Registration and the aggregate number of Registrable Securities that the Holders have requested to be included in such Underwritten Registration, which can be sold without exceeding the Maximum Number of Securities; (C) third, to the extent that the Maximum Number of Securities has not been reached under the foregoing clauses (A) and (B), the Common Shares or other equity securities that the Company desires to sell, which can be sold without exceeding

the Maximum Number of Securities; and (D) fourth, to the extent that the Maximum Number of Securities has not been reached under the foregoing clauses (A), (B) and (C), the Common Shares or other equity securities for the account of other persons or entities that the Company is obligated to register pursuant to separate written contractual arrangements with such persons or entities, which can be sold without exceeding the Maximum Number of Securities.

2.3.3 Piggyback Registration Withdrawal. Any Holder of Registrable Securities shall have the right to withdraw from a Piggyback Registration for any or no reason whatsoever upon written notification to the Company and the Underwriter or Underwriters (if any) of his, her or its intention to withdraw from such Piggyback Registration at least two (2) business days prior to the effectiveness of the Registration Statement filed with the Commission with respect to such Piggyback Registration (or in the case of an Underwritten Registration pursuant to Rule 415, at least five (5) business days prior to the time of pricing of the applicable offering). The Company (whether on its own good faith determination or as the result of a request for withdrawal by persons pursuant to separate written contractual obligations) may withdraw a Registration Statement filed with the Commission in connection with a Piggyback Registration at any time prior to the effectiveness of such Registration Statement. Notwithstanding anything to the contrary in this Agreement, the Company shall be responsible for the Registration Expenses incurred in connection with the Piggyback Registration prior to its withdrawal under this subsection 2.3.3.

2.3.4 Unlimited Piggyback Registration Rights. For purposes of clarity, any Registration effected pursuant to Section 2.3 hereof shall not be counted as a Registration pursuant to a Demand Registration effected under Section 2.2 hereof.

2.4 Restrictions on Registration Rights. If (A) during the period starting with the date thirty (30) days prior to the Company's good faith estimate of the date of the filing of, and ending on a date one hundred and twenty (120) days after the effective date of, a Company initiated Registration and provided that the Company has delivered written notice to the Holders prior to receipt of a Demand Registration pursuant to subsection 2.2.1 and it continues to actively employ, in good faith, all reasonable efforts to cause the applicable Registration Statement to become and/or remain effective; (B) the Holders have requested an Underwritten Registration and the Company and the Holders are unable to obtain the commitment of underwriters to firmly underwrite the offer; or (C) in the good faith judgment of the Board such Registration would be seriously detrimental to the Company and the Board concludes as a result that it is essential to defer the filing of such Registration Statement at such time, then in each case the Company shall furnish to such Holders a certificate signed by the Chairman of the Board, the Chief Executive Officer, the President, the Chief Financial Officer or the Secretary of the Company stating that in the good faith judgment of the Board it would be seriously detrimental to the Company for such Registration Statement to be filed in the near future and that it is therefore essential to defer the filing of such Registration Statement. In such event, the Company shall have the right to defer such filing for a period of not more than sixty (60) days; provided, however, that the Company shall not defer its obligation in this manner more than once in any 12-month period.

2.5 Limitation on Subsequent Registration Rights. From and after the date hereof, the Company shall not, without the prior written consent of the Holders of a majority of the outstanding Registrable Securities, enter into any agreement with any current or future holder of any securities of the Company that would allow such current or future holder to require the Company to include securities in any registration statement filed by the Company on a basis other than expressly subordinate to the piggyback rights of the Holders of Registrable Securities hereunder; provided; however, that in no event shall the Company enter into any agreement that would permit another holder of securities of the Company to participate on a pari passu basis (in terms of priority of cut-back based on advice of underwriters) with a Demanding Holder or a Requesting Holder requesting Registration or an underwritten offering pursuant to subsection 2.2.1.

ARTICLE III

COMPANY PROCEDURES

3.1 General Procedures. If at any time on or after the Closing, the Company is required to effect the Registration of Registrable Securities, the Company shall use its commercially reasonable efforts to effect such Registration to permit the sale of such Registrable Securities in accordance with the intended plan of distribution thereof, and pursuant thereto the Company shall, as soon as reasonably practicable:

3.1.1 prepare and file with the Commission as soon as practicable a Registration Statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such Registration Statement to become effective and remain effective until all Registrable Securities covered by such Registration Statement have been sold or otherwise cease to be Registrable Securities;

3.1.2 prepare and file with the Commission such amendments and post-effective amendments to the Registration Statement, and such supplements to the Prospectus, as may be reasonably requested by the Holders with Registrable Securities registered on such Registration Statement or any Underwriter of Registrable Securities or as may be required by the rules, regulations or instructions applicable to the registration form used by the Company or by the Securities Act or rules and regulations thereunder to keep the Registration Statement effective until all Registrable Securities covered by such Registration Statement are sold in accordance with the intended plan of distribution set forth in such Registration Statement or supplement to the Prospectus or otherwise cease to be Registrable Securities;

3.1.3 prior to filing a Registration Statement or Prospectus, or any amendment or supplement thereto (except for supplements containing Exchange Act reports of the Company filed with respect to a Registration Statement or Prospectus for which forward incorporation by reference is unavailable), furnish without charge to the Underwriters, if any, and the Holders of Registrable Securities included in such Registration, and such Holders' legal counsel, copies of such Registration Statement as proposed to be filed, each amendment and supplement to such Registration Statement (in each case including all exhibits thereto and documents incorporated by reference therein), the Prospectus included in such Registration Statement (including each preliminary Prospectus), and such other documents as the Underwriters and the Holders of Registrable Securities included in such Registration or the legal counsel for any such Holders may request in order to facilitate the disposition of the Registrable Securities owned by such Holders;

3.1.4 prior to any public offering of Registrable Securities, use its best efforts to (i) register or qualify the Registrable Securities covered by the Registration Statement under such securities or "blue sky" laws of such jurisdictions in the United States as the Holders of Registrable Securities included in such Registration Statement (in light of their intended plan of distribution) may request and (ii) take such action necessary to cause such Registrable Securities covered by the Registration Statement to be registered with or approved by such other governmental authorities as may be necessary by virtue of the business and operations of the Company and do any and all other acts and things that may be necessary or advisable to enable the Holders of Registrable Securities included in such Registration Statement to consummate the disposition of such Registrable Securities in such jurisdictions; provided, however, that the Company shall not be required to qualify generally to do business in any jurisdiction where it would not otherwise be required to qualify or take any action to which it would be subject to general service of process or taxation in any such jurisdiction where it is not then otherwise so subject;

3.1.5 cause all such Registrable Securities to be listed on each securities exchange or automated quotation system on which similar securities issued by the Company are then listed;

3.1.6 provide a transfer agent or warrant agent, as applicable, and registrar for all such Registrable Securities no later than the effective date of such Registration Statement;

3.1.7 advise each seller of such Registrable Securities, promptly after it shall receive notice or obtain knowledge thereof, of the issuance of any stop order by the Commission suspending the effectiveness of such Registration Statement or the initiation or threatening of any proceeding for such purpose and promptly use its reasonable best efforts to prevent the issuance of any stop order or to obtain its withdrawal if such stop order should be issued;

3.1.8 at least five (5) days prior to the filing of any Registration Statement or Prospectus or any amendment or supplement to such Registration Statement or Prospectus (except for supplements containing Exchange Act reports of the Company filed with respect to a Registration Statement or Prospectus for which forward incorporation by reference is unavailable), furnish a copy thereof to each seller of such Registrable Securities or its counsel;

3.1.9 notify the Holders at any time when a Prospectus relating to such Registration Statement is required to be delivered under the Securities Act, of the happening of any event as a result of which the Prospectus included in such Registration Statement, as then in effect, includes a Misstatement, and then to correct such Misstatement as set forth in Section 3.5 hereof;

3.1.10 permit a representative of the Holders, the Underwriters, if any, and any attorney or accountant retained by such Holders or Underwriter to participate, at each such person's own expense, in the preparation of the Registration Statement, and cause the Company's officers, directors and employees to supply all information reasonably requested by any such representative, Underwriter, attorney or accountant in connection with the Registration; provided, however, that such representative or Underwriter enter into a confidentiality agreement, in form and substance reasonably satisfactory to the Company, prior to the release or disclosure of any such information;

3.1.11 obtain a "comfort" letter from the Company's independent registered public accountants in the event of an Underwritten Registration, in customary form and covering such matters of the type customarily covered by "comfort" letters as the managing Underwriter may reasonably request, and reasonably satisfactory to a majority-in-interest of the participating Holders;

3.1.12 on the date the Registrable Securities are delivered for sale pursuant to such Registration, obtain an opinion, dated such date, of counsel representing the Company for the purposes of such Registration, addressed to the Holders, the placement agent or sales agent, if any, and the Underwriters, if any, covering such legal matters with respect to the Registration in respect of which such opinion is being given as the Holders, placement agent, sales agent, or Underwriter may reasonably request and as are customarily included in such opinions and negative assurance letters, and reasonably satisfactory to a majority-in-interest of the participating Holders;

3.1.13 in the event of any Underwritten Offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the managing Underwriter of such offering;

3.1.14 make available to its security holders, as soon as reasonably practicable, an earnings statement covering the period of at least twelve (12) months beginning with the first day of the Company's first full calendar quarter after the effective date of the Registration Statement which satisfies the provisions of Section 11(a) of the Securities Act and Rule 158 thereunder (or any successor rule promulgated thereafter by the Commission); provided that the Company will be deemed to have satisfied such requirement to the extent such information is filed on EDGAR or any successor system;

3.1.15 in connection with any Shelf Underwritten Offering pursuant to Section 2.1.3 or any Underwritten Offering pursuant to Section 2.2.3, if such Shelf Underwritten Offering or Underwritten Offering involves the sale of Registrable Securities for gross proceeds in excess of $50,000,000, use its reasonable efforts to make available senior executives of the Company to participate in customary "road show" presentations that may be reasonably requested by the Underwriter in such Shelf Underwritten Offering or Underwritten Offering, as the case may be; and

3.1.16 subject to Section 3.7, in connection with any sale or transfer of Registrable Securities where such Registrable Securities are sold or transferred pursuant to an effective Registration Statement, Rule 144 or any other exemption from the registration requirements of the Securities Act, the Company shall promptly as practicable take any and all action necessary or reasonably requested by the Holder of such Registrable Securities or its transferees in order to permit or facilitate such sale or transfer, including, without limitation, at the sole expense of the Company, by (i) issuing such directions to any transfer agent, registrar or depositary, as applicable, as are reasonably necessary to facilitate such sale or transfer, (ii) delivering such opinions to the transfer agent, registrar or depository as are requested by the same, (iii) taking or causing to be taken such other actions as are reasonably necessary (in each case on a timely basis) in order to (a) cause any legend, notation or similar designation restricting transferability of such Registrable Securities to be removed from the certificates or book entries evidencing such

Registrable Securities, and (b) rescind any transfer restrictions, and (iv) delivering (or causing to be delivered) to any broker, dealer or underwriter purchasing such Registrable Securities or facilitating such sale or transfer any opinions of counsel to the Company and comfort letters from the independent registered public accountants of the Company, each in customary form and covering such matters of the type customarily covered by such opinions or comfort letters, as the case may be, as reasonably requested by such Holder.

3.1.17 otherwise, in good faith, cooperate reasonably with, and take such customary actions as may reasonably be requested by the Holders, in connection with such Registration.

3.2 Registration Expenses. The Registration Expenses of all Registrations shall be borne by the Company. It is acknowledged by the Holders that the Holders shall bear all incremental selling expenses relating to the sale of Registrable Securities, such as Underwriters' commissions and discounts, brokerage fees, Underwriter marketing costs and, other than as set forth in the definition of "Registration Expenses," all fees and expenses of any legal counsel representing the Holders.

3.3 Holder Information Required for Participation in Registrations. At least ten (10) business days prior to the first anticipated filing date of a Registration Statement, the Company shall use its commercially reasonable efforts to notify each Holder in writing (which may be by email) of the information reasonably necessary about the Holder to include such Holder's Registrable Securities in such Registration Statement. At least three (3) business days prior to the anticipated filing date of any post-effective amendment of a Registration Statement (including pursuant to subsection 2.1.2), the Company shall use its commercially reasonable efforts to notify each Holder of Registrable Securities included in such Registration Statement in writing (which may be by email) of the information reasonably necessary about the Holder to keep such Holder's Registrable Securities in such Registration Statement. Notwithstanding anything else in this Agreement, the Company shall not be obligated to include or keep a Holder's Registrable Securities in a Registration Statement to the extent the Company has not received such information, and received any other reasonably requested agreements or certificates, on or prior to the fifth (5^{th}) business day prior to the first anticipated filing date of a Registration Statement or the second (2^{nd}) business day prior to the anticipated filing date of any post-effective amendment of a Registration Statement, as applicable.

3.4 Requirements for Participation in Underwritten Offerings. No person may participate in any Underwritten Offering for equity securities of the Company pursuant to a Registration initiated by the Company hereunder unless such person (i) agrees to sell such person's securities on the basis provided in any underwriting arrangements approved by the Company and (ii) completes and executes all customary questionnaires, powers of attorney, indemnities, lock-up agreements, underwriting agreements and other customary documents as may be reasonably required under the terms of such underwriting arrangements.

3.5 Suspension of Sales; Adverse Disclosure. Upon receipt of written notice from the Company that a Registration Statement or Prospectus contains a Misstatement, each of the Holders shall forthwith discontinue disposition of Registrable Securities until such Holder has received copies of a supplemented or amended Prospectus correcting the Misstatement (it being understood that the Company hereby covenants to prepare and file such supplement or amendment as soon as practicable after the time of such notice), or until it is advised in writing by the Company that the use of the Prospectus may be resumed. If the filing, initial effectiveness or continued use of a Registration Statement in respect of any Registration at any time would require the Company to make an Adverse Disclosure or would require the inclusion in such Registration Statement of financial statements that are unavailable to the Company for reasons beyond the Company's control, the Company may, upon giving prompt written notice of such action to the Holders, delay the filing or initial effectiveness of, or suspend use of, such Registration Statement for the shortest period of time, but in no event more than thirty (30) days, determined in good faith by the Company to be necessary for such purpose. In the event the Company exercises its rights under the preceding sentence, the Holders agree to suspend, immediately upon their receipt of the notice referred to above, their use of the Prospectus relating to any Registration in connection with any sale or offer to sell Registrable Securities. The Company shall immediately notify the Holders of the expiration of any period during which it exercised its rights under this Section 3.5.

3.6 Reporting Obligations. As long as any Holder shall own Registrable Securities, the Company, at all times while it shall be a reporting company under the Exchange Act, covenants to file timely (or obtain extensions in respect thereof and file within the applicable grace period) all reports required to be filed by the Company after the date hereof pursuant to Sections 13(a) or 15(d) of the Exchange Act. The Company further covenants that it shall take such further action as any Holder may reasonably request, all to the extent required from time to time to

enable such Holder to sell Common Shares held by such Holder without registration under the Securities Act within the limitation of the exemptions provided by Rule 144 promulgated under the Securities Act (or any successor rule promulgated thereafter by the Commission), including providing any legal opinions, it being acknowledged by the Holders that the securities of the Company will not be eligible for resale pursuant to Rule 144 promulgated under the Securities Act, until, among other requirements, at least one year has elapsed from the time that the Company has filed current Form 10 information with the Commission reflecting its status as an entity that is not a shell company. Upon the request of any Holder, the Company shall deliver to such Holder a written certification of a duly authorized officer as to whether it has complied with such requirements.

3.7 Compliance with Canadian Securities Laws. With a view to making available the benefits of Canadian securities laws that may at any time permit the resale of Registrable Securities without the filing of a Canadian prospectus, at all times after the Company has become a reporting issuer or the equivalent under Canadian securities laws in any province or territory of Canada, the Company agrees to use its commercially reasonable efforts to (a) file with the appropriate Canadian securities authorities in a timely manner all reports and other documents required under Canadian securities laws, and (b) so long as any Holder owns any Registrable Securities, furnish to any Holder forthwith upon request a written statement by the Company stating that the Company is a reporting issuer and is not in default of any requirement under Canadian Securities Laws.

3.8 Lock-up Restrictions.

3.8.1 During the Founder Shares Six-Month Lock-up Period and the Founder Shares Twelve-Month Lock-up Period (collectively, the "**Founder Lock-up Periods**"), none of the Holders owning the securities subject to the Founder Lock-up Periods shall, and during the DeepGreen Management Lock-up Period and the DeepGreen Shares Lock-up Period (collectively, the "**DeepGreen Lock-up Periods**"), none of the Holders owning the securities subject to the DeepGreen Lock-up Periods shall: offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise dispose of or distribute any Common Shares that are subject to the applicable Lock-up Period or any securities convertible into, exercisable for, exchangeable for or that represent the right to receive Common Shares that are subject to the applicable Lock-up Period, whether now owned or hereinafter acquired, that is owned directly by such Holder (including securities held as a custodian) or with respect to which such Holder has beneficial ownership within the rules and regulations of the Commission (such securities that are subject to an applicable Lock-up Period, the "**Restricted Securities**"), other than any transfer to an affiliate of a Holder or to a Permitted Transferee, as applicable. The foregoing restriction is expressly agreed to preclude each Holder, as applicable, from engaging in any hedging or other transaction with respect to Restricted Securities which is designed to or which reasonably could be expected to lead to or result in a sale or disposition of the Restricted Securities even if such Restricted Securities would be disposed of by someone other than such Existing Holder. Such prohibited hedging or other transactions include any short sale or any purchase, sale or grant of any right (including any put or call option) with respect to any of the Restricted Securities of the applicable Holder, or with respect to any security that includes, relates to, or derives any significant part of its value from such Restricted Securities.

3.8.2 Each Holder hereby represents and warrants that it now has and, except as contemplated by this subsection 3.7.2 for the duration of the applicable Lock-up Period, will have good, and marketable title to its Restricted Securities, free and clear of all liens, encumbrances, and claims that could impair the ability of such Holder to comply with the foregoing restrictions. Subject to subsection 3.1.16, each Holder agrees and consents to the entry of stop-transfer instructions with the Company's transfer agent and registrar against the transfer of any Restricted Securities during the applicable lock-up period.

ARTICLE IV

INDEMNIFICATION AND CONTRIBUTION

4.1 Indemnification.

4.1.1 The Company agrees to indemnify, to the extent permitted by law, each Holder of Registrable Securities, its officers and directors and agents and each person who controls such Holder (within the meaning of the Securities Act) against all losses, claims, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees) resulting from any untrue or alleged untrue statement of material fact contained in any Registration Statement, Prospectus or preliminary Prospectus or any amendment thereof or supplement thereto or any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein not misleading, except insofar as the same are caused by or contained in any information or affidavit so furnished in writing to the Company by such Holder expressly for use therein.

4.1.2 In connection with any Registration Statement in which a Holder of Registrable Securities is participating, such Holder shall furnish to the Company in writing such information and affidavits as the Company reasonably requests for use in connection with any such Registration Statement or Prospectus and, to the extent permitted by law, shall indemnify the Company, its directors and officers and agents and each person who controls the Company (within the meaning of the Securities Act) against all losses, claims, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees) resulting from any untrue or alleged untrue statement of material fact contained in any Registration Statement, Prospectus or preliminary Prospectus or any amendment thereof or supplement thereto or any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein not misleading, but only to the extent that such untrue statement or omission is contained in any information or affidavit so furnished in writing by such Holder expressly for use therein; provided, however, that the obligation to indemnify shall be several, not joint and several, among such Holders of Registrable Securities, and the liability of each such Holder of Registrable Securities shall be in proportion to and limited to the net proceeds received by such Holder from the sale of Registrable Securities pursuant to such Registration Statement. The Holders of Registrable Securities shall indemnify the Underwriters, their officers, directors and each person who controls such Underwriters (within the meaning of the Securities Act) to the same extent as provided in the foregoing with respect to indemnification of the Company.

4.1.3 Any person entitled to indemnification herein shall (i) give prompt written notice to the indemnifying party of any claim with respect to which it seeks indemnification (provided that the failure to give prompt notice shall not impair any person's right to indemnification hereunder to the extent such failure has not materially prejudiced the indemnifying party) and (ii) unless in such indemnified party's reasonable judgment a conflict of interest between such indemnified and indemnifying parties may exist with respect to such claim, permit such indemnifying party to assume the defense of such claim with counsel reasonably satisfactory to the indemnified party. If such defense is assumed, the indemnifying party shall not be subject to any liability for any settlement made by the indemnified party without its consent (but such consent shall not be unreasonably withheld). An indemnifying party who is not entitled to, or elects not to, assume the defense of a claim shall not be obligated to pay the fees and expenses of more than one counsel for all parties indemnified by such indemnifying party with respect to such claim, unless in the reasonable judgment of any indemnified party a conflict of interest may exist between such indemnified party and any other of such indemnified parties with respect to such claim. No indemnifying party shall, without the consent of the indemnified party, consent to the entry of any judgment or enter into any settlement which cannot be settled in all respects by the payment of money (and such money is so paid by the indemnifying party pursuant to the terms of such settlement) or which settlement does not include as an unconditional term thereof the giving by the claimant or plaintiff to such indemnified party of a release from all liability in respect to such claim or litigation.

4.1.4 The indemnification provided for under this Agreement shall remain in full force and effect regardless of any investigation made by or on behalf of the indemnified party or any officer, director or controlling person of such indemnified party and shall survive the transfer of securities. The Company and each Holder of Registrable Securities participating in an offering also agrees to make such provisions as are reasonably requested by any indemnified party for contribution to such party in the event the Company's or such Holder's indemnification is unavailable for any reason.

4.1.5 If the indemnification provided under Section 4.1 hereof from the indemnifying party is unavailable or insufficient to hold harmless an indemnified party in respect of any losses, claims, damages, liabilities and expenses referred to herein, then the indemnifying party, in lieu of indemnifying the indemnified party, shall contribute to the amount paid or payable by the indemnified party as a result of such losses, claims, damages, liabilities and expenses in such proportion as is appropriate to reflect the relative fault of the indemnifying party and the indemnified party, as well as any other relevant equitable considerations. The relative fault of the indemnifying party and indemnified party shall be determined by reference to, among other things, whether any action in question, including any untrue or alleged untrue statement of a material fact or omission or alleged omission to state a material fact, was made by, or relates to information supplied by, such indemnifying party or indemnified party, and the indemnifying party's and indemnified party's relative intent, knowledge, access to information and opportunity to correct or prevent such action and the benefits received by such indemnifying party or indemnified party; provided, however, that the liability of any Holder under this subsection 4.1.5 shall be limited to the amount of the net proceeds received by such Holder in such offering giving rise to such liability. The amount paid or payable by a party as a result of the losses or other liabilities referred to above shall be deemed to include, subject to the limitations set forth in subsections 4.1.1, 4.1.2 and 4.1.3 above, any legal or other fees, charges or expenses reasonably incurred by such party in connection with any investigation or proceeding. The parties hereto agree that it would not be just and equitable if contribution pursuant to this subsection 4.1.5 were determined by pro rata allocation or by any other method of allocation, which does not take account of the equitable considerations referred to in this subsection 4.1.5. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution pursuant to this subsection 4.1.5 from any person who was not guilty of such fraudulent misrepresentation.

ARTICLE V

MISCELLANEOUS

5.1 Notices. Any notice or communication under this Agreement must be in writing and given by (i) deposit in the United States mail, addressed to the party to be notified, postage prepaid and registered or certified with return receipt requested, (ii) delivery in person or by courier service providing evidence of delivery, or (iii) transmission by hand delivery, electronic mail or facsimile. Each notice or communication that is mailed, delivered, or transmitted in the manner described above shall be deemed sufficiently given, served, sent, and received, in the case of mailed notices, on the third business day following the date on which it is mailed and, in the case of notices delivered by courier service, hand delivery, electronic mail or facsimile, at such time as it is delivered to the addressee (with the delivery receipt or the affidavit of messenger) or at such time as delivery is refused by the addressee upon presentation. Any notice or communication under this Agreement must be addressed to the Company, 1601 Bryan Street, Suite 4141, Dallas, Texas 75201, Attn: Chief Executive Officer, with a copy (which shall not constitute notice) to Michael L. Fantozzi, Esq., Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., One Financial Center, Boston, MA 02111, and, if to any Holder, at such Holder's address or other contact information as set forth in the Company's books and records. Any party may change its address for notice at any time and from time to time by written notice to the other parties hereto, and such change of address shall become effective thirty (30) days after delivery of such notice as provided in this Section 5.1.

5.2 Assignment; No Third Party Beneficiaries.

5.2.1 This Agreement and the rights, duties and obligations of the Company and the Holders, as the case may be, hereunder may not be assigned or delegated by the Company or the Holders, as the case may be, in whole or in part, except in connection with a transfer of Registrable Securities by such Holder to a Permitted Transferee, but only if such Permitted Transferee agrees to become bound by the terms and restrictions set forth in this Agreement.

5.2.2 Notwithstanding subsection 5.2.1, prior to the expiration of any Lock-up Period applicable to a Holder, if any, no such Holder may assign or delegate such Holder's rights, duties or obligations under this Agreement, in whole or in part, except in connection with a transfer of Registrable Securities by such Holder to a Permitted Transferee, but only if such Permitted Transferee agrees to become bound by the transfer restrictions set forth in this Agreement, including the lock up restrictions applicable to the transferor, or any other applicable agreements between the Company and such Holder.

5.2.3 This Agreement and the provisions hereof shall be binding upon and shall inure to the benefit of each of the parties and its successors and the permitted assigns of the Holders, which shall include Permitted Transferees.

5.2.4 This Agreement shall not confer any rights or benefits on any persons that are not parties hereto, other than as expressly set forth in this Agreement and Section 5.2 hereof.

5.2.5 No assignment by any party hereto of such party's rights, duties and obligations hereunder shall be binding upon or obligate the Company unless and until the Company shall have received (i) written notice of such assignment as provided in Section 5.1 hereof and (ii) the written agreement of the assignee, in a form reasonably satisfactory to the Company, to be bound by the terms and provisions of this Agreement (which may be accomplished by an addendum or certificate of joinder to this Agreement). Any transfer or assignment made other than as provided in this Section 5.2 shall be null and void.

5.3 Severability. This Agreement shall be deemed severable, and the invalidity or unenforceability of any term or provision hereof shall not affect the validity or enforceability of this Agreement or of any other term or provision hereof. Furthermore, in lieu of any such invalid or unenforceable term or provision, the parties hereto intend that there shall be added as a part of this Agreement a provision as similar in terms to such invalid or unenforceable provision as may be possible that is valid and enforceable.

5.4 Counterparts. This Agreement may be executed in multiple counterparts (including facsimile or PDF counterparts), each of which shall be deemed an original, and all of which together shall constitute the same instrument, but only one of which need be produced.

5.5 Governing Law; Venue. NOTWITHSTANDING THE PLACE WHERE THIS AGREEMENT MAY BE EXECUTED BY ANY OF THE PARTIES HERETO, THE PARTIES EXPRESSLY AGREE THAT (I) THIS AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED UNDER THE LAWS OF THE STATE OF NEW YORK, INCLUDING, WITHOUT LIMITATION, SECTIONS 5-1401 AND 5-1402 OF THE NEW YORK GENERAL OBLIGATIONS LAW AND NEW YORK CIVIL PRACTICE LAWS AND RULES 327(B), AS APPLIED TO AGREEMENTS AMONG NEW YORK RESIDENTS ENTERED INTO AND TO BE PERFORMED ENTIRELY WITHIN NEW YORK, WITHOUT REGARD TO THE CONFLICT OF LAW PROVISIONS OF SUCH JURISDICTION, AND (II) THE VENUE FOR ANY ACTION TAKEN WITH RESPECT TO THIS AGREEMENT SHALL BE ANY STATE OR FEDERAL COURT IN NEW YORK COUNTY IN THE STATE OF NEW YORK.

5.6 Entire Agreement. This Agreement (including all agreements entered into pursuant hereto and all certificates and instruments delivered pursuant hereto and thereto) constitute the entire agreement of the parties with respect to the subject matter hereof and supersede all prior and contemporaneous agreements, representations, understandings, negotiations and discussions between the parties, whether oral or written.

5.7 Amendments and Modifications. Upon the written consent of the Company and the Holders of at least a majority-in-interest of the Registrable Securities at the time in question (including the Holders of at least a majority-in-interest of the Founder Shares and the Holders of at least a majority-in-interest of the DeepGreen Shares), compliance with any of the provisions, covenants and conditions set forth in this Agreement may be waived, or any of such provisions, covenants or conditions may be amended or modified; provided, however, that notwithstanding the foregoing, any amendment hereto or waiver hereof that adversely affects any Holder(s), solely in its capacity as a holder of the shares of the Company, in a manner that is materially different from other Holders (in such capacity) shall require the consent of the Holder(s) so affected. No course of dealing between any Holder or the Company and any other party hereto or any failure or delay on the part of a Holder or the Company in exercising any rights or remedies under this Agreement shall operate as a waiver of any rights or remedies of any Holder or the Company. No single or partial exercise of any rights or remedies under this Agreement by a party shall operate as a waiver or preclude the exercise of any other rights or remedies hereunder or thereunder by such party. Any waiver, amendment or modification effected in accordance with this Section 5.7 shall be binding on all parties hereto, regardless of whether any such party has consented thereto.

5.8 Titles and Headings. Titles and headings of sections of this Agreement are for convenience only and shall not affect the construction of any provision of this Agreement.

5.9 Waivers and Extensions. Any party to this Agreement may waive any right, breach or default which such party has the right to waive, provided that such waiver will not be effective against the waiving party unless it is in writing, is signed by such party, and specifically refers to this Agreement. Waivers may be made in advance or after the right waived has arisen or the breach or default waived has occurred. Any waiver may be conditional. No waiver of any breach of any agreement or provision herein contained shall be deemed a waiver of any preceding or succeeding breach thereof nor of any other agreement or provision herein contained. No waiver or extension of time for performance of any obligations or acts shall be deemed a waiver or extension of the time for performance of any other obligations or acts.

5.10 Remedies Cumulative. In the event that the Company fails to observe or perform any covenant or agreement to be observed or performed under this Agreement, the Holders may proceed to protect and enforce its rights by suit in equity or action at law, whether for specific performance of any term contained in this Agreement or for an injunction against the breach of any such term or in aid of the exercise of any power granted in this Agreement or to enforce any other legal or equitable right, or to take any one or more of such actions, without being required to post a bond. None of the rights, powers or remedies conferred under this Agreement shall be mutually exclusive, and each such right, power or remedy shall be cumulative and in addition to any other right, power or remedy, whether conferred by this Agreement or now or hereafter available at law, in equity, by statute or otherwise.

5.11 Other Registration Rights. The Company represents and warrants that no person, other than the Holders with respect to Registrable Securities, or the PIPE Investors pursuant to the terms of the Subscription Agreements with respect to the PIPE Shares, has any right to require the Company to register any securities of the Company for sale or to include such securities of the Company in any Registration filed by the Company for the sale of securities for its own account or for the account of any other person. Further, the Company represents and warrants that this Agreement supersedes any other registration rights agreement or agreement with similar terms and conditions (excluding the Subscription Agreements) and in the event of a conflict between any such agreement or agreements and this Agreement, the terms of this Agreement shall prevail.

5.12 Term. This Agreement shall terminate upon the earlier of (i) the tenth anniversary of the date of this Agreement, (ii) the date as of which no Registrable Securities remain outstanding; or (iii) the date as of which all Holders of Registrable Securities are permitted to sell the Registrable Securities without registration pursuant to Rule 144 promulgated under the Securities Act (but with no volume or manner of sale restrictions or limitations). The provisions of Section 3.6 and Article IV shall survive any termination.

5.13 Existing Registration Rights Agreement Superseded. Pursuant to Section 6.8 of the Existing Registration Rights Agreement, the undersigned parties who are parties to the Existing Registration Rights Agreement hereby terminate the Existing Registration Rights Agreement, with the intent and effect that the Existing Registration Rights Agreement shall hereby be replaced and superseded in its entirety by this Agreement.

[SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, the undersigned have caused this Agreement to be executed as of the date first written above.

COMPANY:

[•],
a company existing under the laws of British Columbia

By: _____

Name:

Title:

[*Signature Page to Registration Rights Agreement*]

IN WITNESS WHEREOF, the undersigned have caused this Agreement to be executed as of the date first written above.

SPONSOR GROUP HOLDERS:

SUSTAINABLE OPPORTUNITIES
HOLDINGS LLC,
a Delaware limited liability company

By: _____
Name:
Title:

By: _____
Name:

By: _____
Name:

By: _____
Name:

By: _____
Name:

[*Signature Page to Registration Rights Agreement*]

IN WITNESS WHEREOF, the undersigned have caused this Agreement to be executed as of the date first written above.

DEEPGREEN HOLDERS:

_____

_____

_____

_____

_____

_____

_____

_____

_____

[*Signature Page to Registration Rights Agreement*]

Schedule A

Schedule B

Schedule C

Schedule D

ANNEX I

THE COMPANIES LAW (2020 REVISION)
OF THE CAYMAN ISLANDS
COMPANY LIMITED BY SHARES

AMENDED AND RESTATED
MEMORANDUM AND ARTICLES OF ASSOCIATION

OF

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
(ADOPTED BY SPECIAL RESOLUTION DATED 5 MAY 2020 AND EFFECTIVE ON 5 MAY 2020)



Filed: 06-May-2020 10:19 EST
Auth Code: H54397741721

www.verify.gov.ky File#: 358424

THE COMPANIES LAW (2020 REVISION)
OF THE CAYMAN ISLANDS
COMPANY LIMITED BY SHARES

AMENDED AND RESTATED
MEMORANDUM OF ASSOCIATION
OF
SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
(ADOPTED BY SPECIAL RESOLUTION DATED 5 MAY 2020 AND EFFECTIVE ON 5 MAY 2020)

1 The name of the Company is **Sustainable Opportunities Acquisition Corp.**

2 The Registered Office of the Company shall be at the offices of Maples Corporate Services Limited, PO Box 309, Ugland House, Grand Cayman, KY1-1104, Cayman Islands, or at such other place within the Cayman Islands as the Directors may decide.

3 The objects for which the Company is established are unrestricted and the Company shall have full power and authority to carry out any object not prohibited by the laws of the Cayman Islands.

4 The liability of each Member is limited to the amount unpaid on such Member's shares.

5 The share capital of the Company is US$33,100 divided into 300,000,000 Class A ordinary shares of a par value of US$0.0001 each, 30,000,000 Class B ordinary shares of a par value of US$0.0001 each and 1,000,000 preference shares of a par value of US$0.0001 each.

6 The Company has power to register by way of continuation as a body corporate limited by shares under the laws of any jurisdiction outside the Cayman Islands and to be deregistered in the Cayman Islands.

7 Capitalised terms that are not defined in this Memorandum of Association bear the respective meanings given to them in the Articles of Association of the Company.



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THE COMPANIES LAW (2020 REVISION)
OF THE CAYMAN ISLANDS
COMPANY LIMITED BY SHARES

AMENDED AND RESTATED
ARTICLES OF ASSOCIATION
OF
SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
(ADOPTED BY SPECIAL RESOLUTION DATED 5 MAY 2020 AND EFFECTIVE ON 5 MAY 2020)

1 Interpretation

1.1 In the Articles Table A in the First Schedule to the Statute does not apply and, unless there is something in the subject or context inconsistent therewith:

"Affiliate"	in respect of a person, means any other person that, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such person, and (a) in the case of a natural person, shall include, without limitation, such person's spouse, parents, children, siblings, mother-in-law and father-in-law and brothers and sisters-in-law, whether by blood, marriage or adoption or anyone residing in such person's home, a trust for the benefit of any of the foregoing, a company, partnership or any natural person or entity wholly or jointly owned by any of the foregoing and (b) in the case of an entity, shall include a partnership, a corporation or any natural person or entity which directly, or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with, such entity.
"Applicable Law"	means, with respect to any person, all provisions of laws, statutes, ordinances, rules, regulations, permits, certificates, judgments, decisions, decrees or orders of any governmental authority applicable to such person.
"Articles"	means these articles of association of the Company.
"Audit Committee"	means the audit committee of the board of directors of the Company established pursuant to the Articles, or any successor committee.
"Auditor"	means the person for the time being performing the duties of auditor of the Company (if any).
"Business Combination"	means a merger, amalgamation, share exchange, asset acquisition, share purchase, reorganisation or similar business combination involving the Company, with one or more businesses or entities (the "**target business**"), which Business Combination: (a) as long as the Company's securities are listed on the Designated Stock Exchange, must occur with one or more target businesses that together have an aggregate fair market value of at least 80 per cent of the assets held in the Trust Account (excluding the deferred underwriting commissions and taxes payable on the income earned on the Trust Account) at the time of the agreement to enter into such Business Combination; and (b) must not be effectuated solely with another blank cheque company or a similar company with nominal operations.



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"business day"	means any day other than a Saturday, a Sunday or a legal holiday or a day on which banking institutions or trust companies are authorised or obligated by law to close in New York City.
"Clearing House"	means a clearing house recognised by the laws of the jurisdiction in which the Shares (or depositary receipts therefor) are listed or quoted on a stock exchange or interdealer quotation system in such jurisdiction.
"Class A Share"	means a class A ordinary share of a par value of US$0.0001 in the share capital of the Company.
"Class B Share"	means a class B ordinary share of a par value of US$0.0001 in the share capital of the Company.
"Company"	means the above named company.
"Company's Website"	means the website of the Company and/or its web-address or domain name (if any).
"Compensation Committee"	means the compensation committee of the board of directors of the Company established pursuant to the Articles, or any successor committee.
"Designated Stock Exchange"	means any United States national securities exchange on which the securities of the Company are listed for trading, including the New York Stock Exchange.
"Directors"	means the directors for the time being of the Company.
"Dividend"	means any dividend (whether interim or final) resolved to be paid on Shares pursuant to the Articles.
"Electronic Communication"	means a communication sent by electronic means, including electronic posting to the Company's Website, transmission to any number, address or internet website (including the website of the Securities and Exchange Commission) or other electronic delivery methods as otherwise decided and approved by the Directors.
"Electronic Record"	has the same meaning as in the Electronic Transactions Law.
"Electronic Transactions Law"	means the Electronic Transactions Law (2003 Revision) of the Cayman Islands.
"Equity-linked Securities"	means any debt or equity securities that are convertible, exercisable or exchangeable for Class A Shares issued in a financing transaction in connection with a Business Combination, including but not limited to a private placement of equity or debt.
"Exchange Act"	means the United States Securities Exchange Act of 1934, as amended, or any similar U.S. federal statute and the rules and regulations of the Securities and Exchange Commission thereunder, all as the same shall be in effect at the time.
"Founders"	means all Members immediately prior to the consummation of the IPO.
"Independent Director"	has the same meaning as in the rules and regulations of the Designated Stock Exchange or in Rule 10A-3 under the Exchange Act, as the case may be.

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"IPO"	means the Company's initial public offering of securities.
"Member"	has the same meaning as in the Statute.
"Memorandum"	means the memorandum of association of the Company.
"Nominating and Corporate Governance Committee"	means the nominating and corporate governance committee of the board of directors of the Company established pursuant to the Articles, or any successor committee.
"Officer"	means a person appointed to hold an office in the Company.
"Ordinary Resolution"	means a resolution passed by a simple majority of the Members as, being entitled to do so, vote in person or, where proxies are allowed, by proxy at a general meeting, and includes a unanimous written resolution. In computing the majority when a poll is demanded regard shall be had to the number of votes to which each Member is entitled by the Articles.
"Over-Allotment Option"	means the option of the Underwriters to purchase up to an additional 15 per cent of the units (as described in the Articles) sold in the IPO at a price equal to US$10 per unit, less underwriting discounts and commissions.
"Preference Share"	means a preference share of a par value of US$0.0001 in the share capital of the Company.
"Public Share"	means a Class A Share issued as part of the units (as described in the Articles) issued in the IPO.
"Redemption Notice"	means a notice in a form approved by the Company by which a holder of Public Shares is entitled to require the Company to redeem its Public Shares, subject to the condition contained therein.
"Register of Members"	means the register of Members maintained in accordance with the Statute and includes (except where otherwise stated) any branch or duplicate register of Members.
"Registered Office"	means the registered office for the time being of the Company.
"Representative"	means a representative of the Underwriters.
"Seal"	means the common seal of the Company and includes every duplicate seal.
"Securities and Exchange Commission"	means the United States Securities and Exchange commission.
"Share"	means a Class A Share, a Class B Share, or a Preference Share and includes a fraction of a share in the Company.
"Special Resolution"	subject to Article 29.4, has the same meaning as in the Statute, and includes a unanimous written resolution.



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"Sponsor"	means Sustainable Opportunities Holdings LLC, a Delaware limited liability company, and its successors or assigns.
"Statute"	means the Companies Law (2020 Revision) of the Cayman Islands.
"Treasury Share"	means a Share held in the name of the Company as a treasury share in accordance with the Statute.
"Trust Account"	means the trust account established by the Company upon the consummation of its IPO and into which a certain amount of the net proceeds of the IPO, together with a certain amount of the proceeds of a private placement of warrants simultaneously with the closing date of the IPO, will be deposited.
"Underwriter"	means an underwriter of the IPO from time to time and any successor underwriter.

1.2 In the Articles:

(a) words importing the singular number include the plural number and vice versa;

(b) words importing the masculine gender include the feminine gender;

(c) words importing persons include corporations as well as any other legal or natural person;

(d) "written" and "in writing" include all modes of representing or reproducing words in visible form, including in the form of an Electronic Record;

(e) "shall" shall be construed as imperative and "may" shall be construed as permissive;

(f) references to provisions of any law or regulation shall be construed as references to those provisions as amended, modified, re-enacted or replaced;

(g) any phrase introduced by the terms "including", "include", "in particular" or any similar expression shall be construed as illustrative and shall not limit the sense of the words preceding those terms;

(h) the term "and/or" is used herein to mean both "and" as well as "or." The use of "and/or" in certain contexts in no respects qualifies or modifies the use of the terms "and" or "or" in others. The term "or" shall not be interpreted to be exclusive and the term "and" shall not be interpreted to require the conjunctive (in each case, unless the context otherwise requires);

(i) headings are inserted for reference only and shall be ignored in construing the Articles;

(j) any requirements as to delivery under the Articles include delivery in the form of an Electronic Record;

(k) any requirements as to execution or signature under the Articles including the execution of the Articles themselves can be satisfied in the form of an electronic signature as defined in the Electronic Transactions Law;

(l) sections 8 and 19(3) of the Electronic Transactions Law shall not apply;



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(m) the term "clear days" in relation to the period of a notice means that period excluding the day when the notice is received or deemed to be received and the day for which it is given or on which it is to take effect; and

(n) the term "holder" in relation to a Share means a person whose name is entered in the Register of Members as the holder of such Share.

2 Commencement of Business

2.1 The business of the Company may be commenced as soon after incorporation of the Company as the Directors shall see fit.

2.2 The Directors may pay, out of the capital or any other monies of the Company, all expenses incurred in or about the formation and establishment of the Company, including the expenses of registration.

3 Issue of Shares and other Securities

3.1 Subject to the provisions, if any, in the Memorandum (and to any direction that may be given by the Company in general meeting) and, where applicable, the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law, and without prejudice to any rights attached to any existing Shares, the Directors may allot, issue, grant options over or otherwise dispose of Shares (including fractions of a Share) with or without preferred, deferred or other rights or restrictions, whether in regard to Dividends or other distributions, voting, return of capital or otherwise and to such persons, at such times and on such other terms as they think proper, and may also (subject to the Statute and the Articles) vary such rights save that the Directors shall not allot, issue, grant options over or otherwise dispose of Shares (including fractions of a Share) to the extent that it may affect the ability of the Company to carry out a Class B Share Conversion set out in the Articles.

3.2 The Company may issue rights, options, warrants or convertible securities or securities of similar nature conferring the right upon the holders thereof to subscribe for, purchase or receive any class of Shares or other securities in the Company on such terms as the Directors may from time to time determine.

3.3 The Company may issue units of securities in the Company, which may be comprised of whole or fractional Shares, rights, options, warrants or convertible securities or securities of similar nature conferring the right upon the holders thereof to subscribe for, purchase or receive any class of Shares or other securities in the Company, upon such terms as the Directors may from time to time determine.

3.4 The Company shall not issue Shares to bearer.

4 Register of Members

4.1 The Company shall maintain or cause to be maintained the Register of Members in accordance with the Statute.

4.2 The Directors may determine that the Company shall maintain one or more branch registers of Members in accordance with the Statute. The Directors may also determine which register of Members shall constitute the principal register and which shall constitute the branch register or registers, and to vary such determination from time to time.



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5 Closing Register of Members or Fixing Record Date

5.1 For the purpose of determining Members entitled to notice of, or to vote at any meeting of Members or any adjournment thereof, or Members entitled to receive payment of any Dividend or other distribution, or in order to make a determination of Members for any other purpose, the Directors may, after notice has been given by advertisement in an appointed newspaper or any other newspaper or by any other means in accordance with the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law, provide that the Register of Members shall be closed for transfers for a stated period which shall not in any case exceed forty days.

5.2 In lieu of, or apart from, closing the Register of Members, the Directors may fix in advance or arrears a date as the record date for any such determination of Members entitled to notice of, or to vote at any meeting of the Members or any adjournment thereof, or for the purpose of determining the Members entitled to receive payment of any Dividend or other distribution, or in order to make a determination of Members for any other purpose.

5.3 If the Register of Members is not so closed and no record date is fixed for the determination of Members entitled to notice of, or to vote at, a meeting of Members or Members entitled to receive payment of a Dividend or other distribution, the date on which notice of the meeting is sent or the date on which the resolution of the Directors resolving to pay such Dividend or other distribution is passed, as the case may be, shall be the record date for such determination of Members. When a determination of Members entitled to vote at any meeting of Members has been made as provided in this Article, such determination shall apply to any adjournment thereof.

6 Certificates for Shares

6.1 A Member shall only be entitled to a share certificate if the Directors resolve that share certificates shall be issued. Share certificates representing Shares, if any, shall be in such form as the Directors may determine. Share certificates shall be signed by one or more Directors or other person authorised by the Directors. The Directors may authorise certificates to be issued with the authorised signature(s) affixed by mechanical process. All certificates for Shares shall be consecutively numbered or otherwise identified and shall specify the Shares to which they relate. All certificates surrendered to the Company for transfer shall be cancelled and, subject to the Articles, no new certificate shall be issued until the former certificate representing a like number of relevant Shares shall have been surrendered and cancelled.

6.2 The Company shall not be bound to issue more than one certificate for Shares held jointly by more than one person and delivery of a certificate to one joint holder shall be a sufficient delivery to all of them.

6.3 If a share certificate is defaced, worn out, lost or destroyed, it may be renewed on such terms (if any) as to evidence and indemnity and on the payment of such expenses reasonably incurred by the Company in investigating evidence, as the Directors may prescribe, and (in the case of defacement or wearing out) upon delivery of the old certificate.

6.4 Every share certificate sent in accordance with the Articles will be sent at the risk of the Member or other person entitled to the certificate. The Company will not be responsible for any share certificate lost or delayed in the course of delivery.



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6.5 Share certificates shall be issued within the relevant time limit as prescribed by the Statute, if applicable, or as the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law may from time to time determine, whichever is shorter, after the allotment or, except in the case of a Share transfer which the Company is for the time being entitled to refuse to register and does not register, after lodgement of a Share transfer with the Company.

7 Transfer of Shares

7.1 Subject to the terms of the Articles, any Member may transfer all or any of his Shares by an instrument of transfer provided that such transfer complies with the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law. If the Shares in question were issued in conjunction with rights, options or warrants issued pursuant to the Articles on terms that one cannot be transferred without the other, the Directors shall refuse to register the transfer of any such Share without evidence satisfactory to them of the like transfer of such option or warrant.

7.2 The instrument of transfer of any Share shall be in writing in the usual or common form or in a form prescribed by the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law or in any other form approved by the Directors and shall be executed by or on behalf of the transferor (and if the Directors so require, signed by or on behalf of the transferee) and may be under hand or, if the transferor or transferee is a Clearing House or its nominee(s), by hand or by machine imprinted signature or by such other manner of execution as the Directors may approve from time to time. The transferor shall be deemed to remain the holder of a Share until the name of the transferee is entered in the Register of Members.

8 Redemption, Repurchase and Surrender of Shares

8.1 Subject to the provisions of the Statute, and, where applicable, the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law, the Company may issue Shares that are to be redeemed or are liable to be redeemed at the option of the Member or the Company. The redemption of such Shares, except Public Shares, shall be effected in such manner and upon such other terms as the Company may, by Special Resolution, determine before the issue of such Shares. With respect to redeeming or repurchasing the Shares:

(a) Members who hold Public Shares are entitled to request the redemption of such Shares in the circumstances described in the Business Combination Article hereof;

(b) Class B Shares held by the Founders shall be surrendered by the Founders for no consideration to the extent that the Over-Allotment Option is not exercised in full so that the Founders will own 20 percent of the Company's issued Shares after the IPO (exclusive of any securities purchased in a private placement simultaneously with the IPO); and

(c) Public Shares shall be repurchased by way of tender offer in the circumstances set out in the Business Combination Article hereof.



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8.2 Subject to the provisions of the Statute, and, where applicable, the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law, the Company may purchase its own Shares (including any redeemable Shares) in such manner and on such other terms as the Directors may agree with the relevant Member. For the avoidance of doubt, redemptions, repurchases and surrenders of Shares in the circumstances described in the Article above shall not require further approval of the Members.

8.3 The Company may make a payment in respect of the redemption or purchase of its own Shares in any manner permitted by the Statute, including out of capital.

8.4 The Directors may accept the surrender for no consideration of any fully paid Share.

9 Treasury Shares

9.1 The Directors may, prior to the purchase, redemption or surrender of any Share, determine that such Share shall be held as a Treasury Share.

9.2 The Directors may determine to cancel a Treasury Share or transfer a Treasury Share on such terms as they think proper (including, without limitation, for nil consideration).

10 Variation of Rights of Shares

10.1 Subject to Article 3.1, if at any time the share capital of the Company is divided into different classes of Shares, all or any of the rights attached to any class (unless otherwise provided by the terms of issue of the Shares of that class) may, whether or not the Company is being wound up, be varied without the consent of the holders of the issued Shares of that class where such variation is considered by the Directors not to have a material adverse effect upon such rights; otherwise, any such variation shall be made only with the consent in writing of the holders of not less than two thirds of the issued Shares of that class (other than with respect to a waiver of the provisions of the Class B Share Conversion Article hereof, which as stated therein shall only require the consent in writing of the holders of a majority of the issued Shares of that class), or with the approval of a resolution passed by a majority of not less than two thirds of the votes cast at a separate meeting of the holders of the Shares of that class. For the avoidance of doubt, the Directors reserve the right, notwithstanding that any such variation may not have a material adverse effect, to obtain consent from the holders of Shares of the relevant class. To any such meeting all the provisions of the Articles relating to general meetings shall apply *mutatis mutandis*, except that the necessary quorum shall be one person holding or representing by proxy at least one third of the issued Shares of the class and that any holder of Shares of the class present in person or by proxy may demand a poll.

10.2 For the purposes of a separate class meeting, the Directors may treat two or more or all the classes of Shares as forming one class of Shares if the Directors consider that such class of Shares would be affected in the same way by the proposals under consideration, but in any other case shall treat them as separate classes of Shares.

10.3 The rights conferred upon the holders of the Shares of any class issued with preferred or other rights shall not, unless otherwise expressly provided by the terms of issue of the Shares of that class, be deemed to be varied by the creation or issue of further Shares ranking pari passu therewith or Shares issued with preferred or other rights.



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11 Commission on Sale of Shares

The Company may, in so far as the Statute permits, pay a commission to any person in consideration of his subscribing or agreeing to subscribe (whether absolutely or conditionally) or procuring or agreeing to procure subscriptions (whether absolutely or conditionally) for any Shares. Such commissions may be satisfied by the payment of cash and/or the issue of fully or partly paid-up Shares. The Company may also on any issue of Shares pay such brokerage as may be lawful.

12 Non Recognition of Trusts

The Company shall not be bound by or compelled to recognise in any way (even when notified) any equitable, contingent, future or partial interest in any Share, or (except only as is otherwise provided by the Articles or the Statute) any other rights in respect of any Share other than an absolute right to the entirety thereof in the holder.

13 Lien on Shares

13.1 The Company shall have a first and paramount lien on all Shares (whether fully paid-up or not) registered in the name of a Member (whether solely or jointly with others) for all debts, liabilities or engagements to or with the Company (whether presently payable or not) by such Member or his estate, either alone or jointly with any other person, whether a Member or not, but the Directors may at any time declare any Share to be wholly or in part exempt from the provisions of this Article. The registration of a transfer of any such Share shall operate as a waiver of the Company's lien thereon. The Company's lien on a Share shall also extend to any amount payable in respect of that Share.

13.2 The Company may sell, in such manner as the Directors think fit, any Shares on which the Company has a lien, if a sum in respect of which the lien exists is presently payable, and is not paid within fourteen clear days after notice has been received or deemed to have been received by the holder of the Shares, or to the person entitled to it in consequence of the death or bankruptcy of the holder, demanding payment and stating that if the notice is not complied with the Shares may be sold.

13.3 To give effect to any such sale the Directors may authorise any person to execute an instrument of transfer of the Shares sold to, or in accordance with the directions of, the purchaser. The purchaser or his nominee shall be registered as the holder of the Shares comprised in any such transfer, and he shall not be bound to see to the application of the purchase money, nor shall his title to the Shares be affected by any irregularity or invalidity in the sale or the exercise of the Company's power of sale under the Articles.

13.4 The net proceeds of such sale after payment of costs, shall be applied in payment of such part of the amount in respect of which the lien exists as is presently payable and any balance shall (subject to a like lien for sums not presently payable as existed upon the Shares before the sale) be paid to the person entitled to the Shares at the date of the sale.

14 Call on Shares

14.1 Subject to the terms of the allotment and issue of any Shares, the Directors may make calls upon the Members in respect of any monies unpaid on their Shares (whether in respect of par value or premium), and each Member shall (subject to receiving at least fourteen clear days' notice specifying the time or times of payment) pay to the Company at the time or times so specified the amount called on the Shares. A call may be revoked or postponed, in whole or in part, as the Directors may determine. A call may be required to be paid by instalments. A person upon whom a call is made shall remain liable for calls made upon him notwithstanding the subsequent transfer of the Shares in respect of which the call was made.



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14.2 A call shall be deemed to have been made at the time when the resolution of the Directors authorising such call was passed.

14.3 The joint holders of a Share shall be jointly and severally liable to pay all calls in respect thereof.

14.4 If a call remains unpaid after it has become due and payable, the person from whom it is due shall pay interest on the amount unpaid from the day it became due and payable until it is paid at such rate as the Directors may determine (and in addition all expenses that have been incurred by the Company by reason of such non-payment), but the Directors may waive payment of the interest or expenses wholly or in part.

14.5 An amount payable in respect of a Share on issue or allotment or at any fixed date, whether on account of the par value of the Share or premium or otherwise, shall be deemed to be a call and if it is not paid all the provisions of the Articles shall apply as if that amount had become due and payable by virtue of a call.

14.6 The Directors may issue Shares with different terms as to the amount and times of payment of calls, or the interest to be paid.

14.7 The Directors may, if they think fit, receive an amount from any Member willing to advance all or any part of the monies uncalled and unpaid upon any Shares held by him, and may (until the amount would otherwise become payable) pay interest at such rate as may be agreed upon between the Directors and the Member paying such amount in advance.

14.8 No such amount paid in advance of calls shall entitle the Member paying such amount to any portion of a Dividend or other distribution payable in respect of any period prior to the date upon which such amount would, but for such payment, become payable.

15 Forfeiture of Shares

15.1 If a call or instalment of a call remains unpaid after it has become due and payable the Directors may give to the person from whom it is due not less than fourteen clear days' notice requiring payment of the amount unpaid together with any interest which may have accrued and any expenses incurred by the Company by reason of such non-payment. The notice shall specify where payment is to be made and shall state that if the notice is not complied with the Shares in respect of which the call was made will be liable to be forfeited.

15.2 If the notice is not complied with, any Share in respect of which it was given may, before the payment required by the notice has been made, be forfeited by a resolution of the Directors. Such forfeiture shall include all Dividends, other distributions or other monies payable in respect of the forfeited Share and not paid before the forfeiture.

15.3 A forfeited Share may be sold, re-allotted or otherwise disposed of on such terms and in such manner as the Directors think fit and at any time before a sale, re-allotment or disposition the forfeiture may be cancelled on such terms as the Directors think fit. Where for the purposes of its disposal a forfeited Share is to be transferred to any person the Directors may authorise some person to execute an instrument of transfer of the Share in favour of that person.

15.4 A person any of whose Shares have been forfeited shall cease to be a Member in respect of them and shall surrender to the Company for cancellation the certificate for the Shares forfeited and shall remain liable to pay to the Company all monies which at the date of forfeiture were payable by him to the Company in respect of those Shares together with interest at such rate as the Directors may determine, but his liability shall cease if and when the Company shall have received payment in full of all monies due and payable by him in respect of those Shares.



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15.5 A certificate in writing under the hand of one Director or Officer that a Share has been forfeited on a specified date shall be conclusive evidence of the facts stated in it as against all persons claiming to be entitled to the Share. The certificate shall (subject to the execution of an instrument of transfer) constitute a good title to the Share and the person to whom the Share is sold or otherwise disposed of shall not be bound to see to the application of the purchase money, if any, nor shall his title to the Share be affected by any irregularity or invalidity in the proceedings in reference to the forfeiture, sale or disposal of the Share.

15.6 The provisions of the Articles as to forfeiture shall apply in the case of non payment of any sum which, by the terms of issue of a Share, becomes payable at a fixed time, whether on account of the par value of the Share or by way of premium as if it had been payable by virtue of a call duly made and notified.

16 Transmission of Shares

16.1 If a Member dies, the survivor or survivors (where he was a joint holder), or his legal personal representatives (where he was a sole holder), shall be the only persons recognised by the Company as having any title to his Shares. The estate of a deceased Member is not thereby released from any liability in respect of any Share, for which he was a joint or sole holder.

16.2 Any person becoming entitled to a Share in consequence of the death or bankruptcy or liquidation or dissolution of a Member (or in any other way than by transfer) may, upon such evidence being produced as may be required by the Directors, elect, by a notice in writing sent by him to the Company, either to become the holder of such Share or to have some person nominated by him registered as the holder of such Share. If he elects to have another person registered as the holder of such Share he shall sign an instrument of transfer of that Share to that person. The Directors shall, in either case, have the same right to decline or suspend registration as they would have had in the case of a transfer of the Share by the relevant Member before his death or bankruptcy or liquidation or dissolution, as the case may be.

16.3 A person becoming entitled to a Share by reason of the death or bankruptcy or liquidation or dissolution of a Member (or in any other case than by transfer) shall be entitled to the same Dividends, other distributions and other advantages to which he would be entitled if he were the holder of such Share. However, he shall not, before becoming a Member in respect of a Share, be entitled in respect of it to exercise any right conferred by membership in relation to general meetings of the Company and the Directors may at any time give notice requiring any such person to elect either to be registered himself or to have some person nominated by him be registered as the holder of the Share (but the Directors shall, in either case, have the same right to decline or suspend registration as they would have had in the case of a transfer of the Share by the relevant Member before his death or bankruptcy or liquidation or dissolution or any other case than by transfer, as the case may be). If the notice is not complied with within ninety days of being received or deemed to be received (as determined pursuant to the Articles), the Directors may thereafter withhold payment of all Dividends, other distributions, bonuses or other monies payable in respect of the Share until the requirements of the notice have been complied with.

17 Class B Share Conversion

17.1 The rights attaching to all Shares shall rank *pari passu* in all respects, and the Class A Shares and Class B Shares shall vote together as a single class on all matters (subject to the Variation of Rights of Shares Article and the Appointment and Removal of Directors Article hereof) with the exception that the holder of a Class B Share shall have the Conversion Rights referred to in this Article.

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17.2 Class B Shares shall automatically convert into Class A Shares on a one-for-one basis (the "**Initial Conversion Ratio**"): (a) at any time and from time to time at the option of the holder thereof; and (b) automatically on the day of the closing of a Business Combination.

17.3 Notwithstanding the Initial Conversion Ratio, in the case that additional Class A Shares or any other Equity-linked Securities, are issued, or deemed issued, by the Company in excess of the amounts offered in the IPO and related to the closing of a Business Combination, all Class B Shares in issue shall automatically convert into Class A Shares at the time of the closing of a Business Combination at an adjusted ratio so that the number of Class A Shares issuable upon conversion of all Class B Shares will equal, in the aggregate, 20 per cent of the sum of all Class A Shares and Class B Shares in issue upon completion of the IPO plus all Class A Shares and Equity-linked Securities issued, or deemed issued, in connection with a Business Combination, excluding any Shares or Equity-linked Securities issued, or to be issued, to any seller in a Business Combination and any private placement warrants issued to the Sponsor or an affiliate of the Sponsor or certain of the Officers and Directors upon conversion of working capital loans.

17.4 Notwithstanding anything to the contrary contained herein, the foregoing adjustment to the Initial Conversion Ratio may be waived as to any particular issuance, or deemed issuance, of additional Class A Shares or Equity-linked Securities by the written consent or agreement of holders of a majority of the Class B Shares then in issue consenting or agreeing separately as a separate class in the manner provided in the Variation of Rights of Shares Article hereof.

17.5 The foregoing conversion ratio shall also be adjusted to account for any subdivision (by share split, subdivision, exchange, capitalisation, rights issue, reclassification, recapitalisation or otherwise) or combination (by reverse share split, share consolidation, exchange, reclassification, recapitalisation or otherwise) or similar reclassification or recapitalisation of the Class A Shares in issue into a greater or lesser number of shares occurring after the original filing of the Articles without a proportionate and corresponding subdivision, combination or similar reclassification or recapitalisation of the Class B Shares in issue.

17.6 Each Class B Share shall convert into its pro rata number of Class A Shares pursuant to this Article. The pro rata share for each holder of Class B Shares will be determined as follows: each Class B Share shall convert into such number of Class A Shares as is equal to the product of 1 multiplied by a fraction, the numerator of which shall be the total number of Class A Shares into which all of the Class B Shares in issue shall be converted pursuant to this Article and the denominator of which shall be the total number of Class B Shares in issue at the time of conversion.

17.7 References in this Article to "**converted**", "**conversion**" or "**exchange**" shall mean the compulsory redemption without notice of Class B Shares of any Member and, on behalf of such Members, automatic application of such redemption proceeds in paying for such new Class A Shares into which the Class B Shares have been converted or exchanged at a price per Class B Share necessary to give effect to a conversion or exchange calculated on the basis that the Class A Shares to be issued as part of the conversion or exchange will be issued at par. The Class A Shares to be issued on an exchange or conversion shall be registered in the name of such Member or in such name as the Member may direct.

17.8 Notwithstanding anything to the contrary in this Article, in no event may any Class B Share convert into Class A Shares at a ratio that is less than one-for-one.



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18 Amendments of Memorandum and Articles of Association and Alteration of Capital

18.1 The Company may by Ordinary Resolution:

(a) increase its share capital by such sum as the Ordinary Resolution shall prescribe and with such rights, priorities and privileges annexed thereto, as the Company in general meeting may determine;

(b) consolidate and divide all or any of its share capital into Shares of larger amount than its existing Shares;

(c) convert all or any of its paid-up Shares into stock, and reconvert that stock into paid-up Shares of any denomination;

(d) by subdivision of its existing Shares or any of them divide the whole or any part of its share capital into Shares of smaller amount than is fixed by the Memorandum or into Shares without par value; and

(e) cancel any Shares that at the date of the passing of the Ordinary Resolution have not been taken or agreed to be taken by any person and diminish the amount of its share capital by the amount of the Shares so cancelled.

18.2 All new Shares created in accordance with the provisions of the preceding Article shall be subject to the same provisions of the Articles with reference to the payment of calls, liens, transfer, transmission, forfeiture and otherwise as the Shares in the original share capital.

18.3 Subject to the provisions of the Statute, the provisions of the Articles as regards the matters to be dealt with by Ordinary Resolution and Article 29.4, the Company may by Special Resolution:

(a) change its name;

(b) alter or add to the Articles (subject to Article 29.4);

(c) alter or add to the Memorandum with respect to any objects, powers or other matters specified therein; and

(d) reduce its share capital or any capital redemption reserve fund.

19 Offices and Places of Business

Subject to the provisions of the Statute, the Company may by resolution of the Directors change the location of its Registered Office. The Company may, in addition to its Registered Office, maintain such other offices or places of business as the Directors determine.

20 General Meetings

20.1 All general meetings other than annual general meetings shall be called extraordinary general meetings.

20.2 The Company may, but shall not (unless required by the Statute) be obliged to, in each year hold a general meeting as its annual general meeting, and shall specify the meeting as such in the notices calling it. Any annual general meeting shall be held at such time and place as the Directors shall appoint and if no other time and place is prescribed by them, it shall be held at the Registered Office on the second Wednesday in December of each year at ten o'clock in the morning. At these meetings the report of the Directors (if any) shall be presented.



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20.3 The Directors, the chief executive officer or the chairman of the board of Directors may call general meetings, and, for the avoidance of doubt, Members shall not have the ability to call general meetings.

20.4 Members seeking to bring business before the annual general meeting or to nominate candidates for appointment as Directors at the annual general meeting must deliver notice to the principal executive offices of the Company not later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the scheduled date of the annual general meeting.

21 Notice of General Meetings

21.1 At least five clear days' notice shall be given of any general meeting. Every notice shall specify the place, the day and the hour of the meeting and the general nature of the business to be conducted at the general meeting and shall be given in the manner hereinafter mentioned or in such other manner if any as may be prescribed by the Company, provided that a general meeting of the Company shall, whether or not the notice specified in this Article has been given and whether or not the provisions of the Articles regarding general meetings have been complied with, be deemed to have been duly convened if it is so agreed:

(a) in the case of an annual general meeting, by all of the Members entitled to attend and vote thereat; and

(b) in the case of an extraordinary general meeting, by a majority in number of the Members having a right to attend and vote at the meeting, together holding not less than ninety-five per cent in par value of the Shares giving that right.

21.2 The accidental omission to give notice of a general meeting to, or the non receipt of notice of a general meeting by, any person entitled to receive such notice shall not invalidate the proceedings of that general meeting.

22 Proceedings at General Meetings

22.1 No business shall be transacted at any general meeting unless a quorum is present. The holders of a majority of the Shares being individuals present in person or by proxy or if a corporation or other non-natural person by its duly authorised representative or proxy shall be a quorum.

22.2 A person may participate at a general meeting by conference telephone or other communications equipment by means of which all the persons participating in the meeting can communicate with each other. Participation by a person in a general meeting in this manner is treated as presence in person at that meeting.

22.3 A resolution (including a Special Resolution) in writing (in one or more counterparts) signed by or on behalf of all of the Members for the time being entitled to receive notice of and to attend and vote at general meetings (or, being corporations or other non-natural persons, signed by their duly authorised representatives) shall be as valid and effective as if the resolution had been passed at a general meeting of the Company duly convened and held.

22.4 If a quorum is not present within half an hour from the time appointed for the meeting to commence or if during such a meeting a quorum ceases to be present, the meeting, if convened upon a Members' requisition, shall be dissolved and in any other case it shall stand adjourned to the same day in the next week at the same time and/or place or to such other day, time and/or place as the Directors may determine, and if at the adjourned meeting a quorum is not present within half an hour from the time appointed for the meeting to commence, the Members present shall be a quorum.



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22.5 The Directors may, at any time prior to the time appointed for the meeting to commence, appoint any person to act as chairman of a general meeting of the Company or, if the Directors do not make any such appointment, the chairman, if any, of the board of Directors shall preside as chairman at such general meeting. If there is no such chairman, or if he shall not be present within fifteen minutes after the time appointed for the meeting to commence, or is unwilling to act, the Directors present shall elect one of their number to be chairman of the meeting.

22.6 If no Director is willing to act as chairman or if no Director is present within fifteen minutes after the time appointed for the meeting to commence, the Members present shall choose one of their number to be chairman of the meeting.

22.7 The chairman may, with the consent of a meeting at which a quorum is present (and shall if so directed by the meeting) adjourn the meeting from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.

22.8 When a general meeting is adjourned for thirty days or more, notice of the adjourned meeting shall be given as in the case of an original meeting. Otherwise it shall not be necessary to give any such notice of an adjourned meeting.

22.9 If, prior to a Business Combination, a notice is issued in respect of a general meeting and the Directors, in their absolute discretion, consider that it is impractical or undesirable for any reason to hold that general meeting at the place, the day and the hour specified in the notice calling such general meeting, the Directors may postpone the general meeting to another place, day and/or hour provided that notice of the place, the day and the hour of the rearranged general meeting is promptly given to all Members. No business shall be transacted at any postponed meeting other than the business specified in the notice of the original meeting.

22.10 When a general meeting is postponed for thirty days or more, notice of the postponed meeting shall be given as in the case of an original meeting. Otherwise it shall not be necessary to give any such notice of a postponed meeting. All proxy forms submitted for the original general meeting shall remain valid for the postponed meeting. The Directors may postpone a general meeting which has already been postponed.

22.11 A resolution put to the vote of the meeting shall be decided on a poll.

22.12 A poll shall be taken as the chairman directs, and the result of the poll shall be deemed to be the resolution of the general meeting at which the poll was demanded.

22.13 A poll demanded on the election of a chairman or on a question of adjournment shall be taken forthwith. A poll demanded on any other question shall be taken at such date, time and place as the chairman of the general meeting directs, and any business other than that upon which a poll has been demanded or is contingent thereon may proceed pending the taking of the poll.

22.14 In the case of an equality of votes the chairman shall be entitled to a second or casting vote.

23 Votes of Members

23.1 Subject to any rights or restrictions attached to any Shares, including as set out at Article 29.4, every Member present in any such manner shall have one vote for every Share of which he is the holder.



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23.2 In the case of joint holders the vote of the senior holder who tenders a vote, whether in person or by proxy (or, in the case of a corporation or other non-natural person, by its duly authorised representative or proxy), shall be accepted to the exclusion of the votes of the other joint holders, and seniority shall be determined by the order in which the names of the holders stand in the Register of Members.

23.3 A Member of unsound mind, or in respect of whom an order has been made by any court, having jurisdiction in lunacy, may vote by his committee, receiver, curator bonis, or other person on such Member's behalf appointed by that court, and any such committee, receiver, curator bonis or other person may vote by proxy.

23.4 No person shall be entitled to vote at any general meeting unless he is registered as a Member on the record date for such meeting nor unless all calls or other monies then payable by him in respect of Shares have been paid.

23.5 No objection shall be raised as to the qualification of any voter except at the general meeting or adjourned general meeting at which the vote objected to is given or tendered and every vote not disallowed at the meeting shall be valid. Any objection made in due time in accordance with this Article shall be referred to the chairman whose decision shall be final and conclusive.

23.6 Votes may be cast either personally or by proxy (or in the case of a corporation or other non-natural person by its duly authorised representative or proxy). A Member may appoint more than one proxy or the same proxy under one or more instruments to attend and vote at a meeting. Where a Member appoints more than one proxy the instrument of proxy shall specify the number of Shares in respect of which each proxy is entitled to exercise the related votes.

23.7 A Member holding more than one Share need not cast the votes in respect of his Shares in the same way on any resolution and therefore may vote a Share or some or all such Shares either for or against a resolution and/or abstain from voting a Share or some or all of the Shares and, subject to the terms of the instrument appointing him, a proxy appointed under one or more instruments may vote a Share or some or all of the Shares in respect of which he is appointed either for or against a resolution and/or abstain from voting a Share or some or all of the Shares in respect of which he is appointed.

24 Proxies

24.1 The instrument appointing a proxy shall be in writing and shall be executed under the hand of the appointor or of his attorney duly authorised in writing, or, if the appointor is a corporation or other non natural person, under the hand of its duly authorised representative. A proxy need not be a Member.

24.2 The Directors may, in the notice convening any meeting or adjourned meeting, or in an instrument of proxy sent out by the Company, specify the manner by which the instrument appointing a proxy shall be deposited and the place and the time (being not later than the time appointed for the commencement of the meeting or adjourned meeting to which the proxy relates) at which the instrument appointing a proxy shall be deposited. In the absence of any such direction from the Directors in the notice convening any meeting or adjourned meeting or in an instrument of proxy sent out by the Company, the instrument appointing a proxy shall be deposited physically at the Registered Office not less than 48 hours before the time appointed for the meeting or adjourned meeting to commence at which the person named in the ins trument proposes to vote.

24.3 The chairman may in any event at his discretion declare that an instrument of proxy shall be deemed to have been duly deposited. An instrument of proxy that is not deposited in the manner permitted, or which has not been declared to have been duly deposited by the chairman, shall be invalid.



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24.4 The instrument appointing a proxy may be in any usual or common form (or such other form as the Directors may approve) and may be expressed to be for a particular meeting or any adjournment thereof or generally until revoked. An instrument appointing a proxy shall be deemed to include the power to demand or join or concur in demanding a poll.

24.5 Votes given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death or insanity of the principal or revocation of the proxy or of the authority under which the proxy was executed, or the transfer of the Share in respect of which the proxy is given unless notice in writing of such death, insanity, revocation or transfer was received by the Company at the Registered Office before the commencement of the general meeting, or adjourned meeting at which it is sought to use the proxy.

25 Corporate Members

25.1 Any corporation or other non-natural person which is a Member may in accordance with its constitutional documents, or in the absence of such provision by resolution of its directors or other governing body, authorise such person as it thinks fit to act as its representative at any meeting of the Company or of any class of Members, and the person so authorised shall be entitled to exercise the same powers on behalf of the corporation which he represents as the corporation could exercise if it were an individual Member.

25.2 If a Clearing House (or its nominee(s)), being a corporation, is a Member, it may authorise such persons as it sees fit to act as its representative at any meeting of the Company or at any meeting of any class of Members provided that the authorisation shall specify the number and class of Shares in respect of which each such representative is so authorised. Each person so authorised under the provisions of this Article shall be deemed to have been duly authorised without further evidence of the facts and be entitled to exercise the same rights and powers on behalf of the Clearing House (or its nominee(s)) as if such person was the registered holder of such Shares held by the Clearing House (or its nominee(s)).

26 Shares that May Not be Voted

Shares in the Company that are beneficially owned by the Company shall not be voted, directly or indirectly, at any meeting and shall not be counted in determining the total number of outstanding Shares at any given time.

27 Directors

27.1 There shall be a board of Directors consisting of not less than one person provided however that the Company may by Ordinary Resolution increase or reduce the limits in the number of Directors.



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27.2 The Directors shall be divided into three classes: Class I, Class II and Class III. The number of Directors in each class shall be as nearly equal as possible. Upon the adoption of the Articles, the existing Directors shall by resolution classify themselves as Class I, Class II or Class III Directors. The Class I Directors shall stand elected for a term expiring at the Company's first annual general meeting, the Class II Directors shall stand elected for a term expiring at the Company's second annual general meeting and the Class III Directors shall stand elected for a term expiring at the Company's third annual general meeting. Commencing at the Company's first annual general meeting, and at each annual general meeting thereafter, Directors elected to succeed those Directors whose terms expire shall be elected for a term of office to expire at the third succeeding annual general meeting after their election. Except as the Statute or other Applicable Law may otherwise require, in the interim between annual general meetings or extraordinary general meetings called for the election of Directors and/or the removal of one or more Directors and the filling of any vacancy in that connection, additional Directors and any vacancies in the board of Directors, including unfilled vacancies resulting from the removal of Directors for cause, may be filled by the vote of a majority of the remaining Directors then in office, although less than a quorum (as defined in the Articles), or by the sole remaining Director. All Directors shall hold office until the expiration of their respective terms of office and until their successors shall have been elected and qualified. A Director elected to fill a vacancy resulting from the death, resignation or removal of a Director shall serve for the remainder of the full term of the Director whose death, resignation or removal shall have created such vacancy and until his successor shall have been elected and qualified.

28 Powers of Directors

28.1 Subject to the provisions of the Statute, the Memorandum and the Articles and to any directions given by Special Resolution, the business of the Company shall be managed by the Directors who may exercise all the powers of the Company. No alteration of the Memorandum or Articles and no such direction shall invalidate any prior act of the Directors which would have been valid if that alteration had not been made or that direction had not been given. A duly convened meeting of Directors at which a quorum is present may exercise all powers exercisable by the Directors.

28.2 All cheques, promissory notes, drafts, bills of exchange and other negotiable or transferable instruments and all receipts for monies paid to the Company shall be signed, drawn, accepted, endorsed or otherwise executed as the case may be in such manner as the Directors shall determine by resolution.

28.3 The Directors on behalf of the Company may pay a gratuity or pension or allowance on retirement to any Director who has held any other salaried office or place of profit with the Company or to his widow or dependants and may make contributions to any fund and pay premiums for the purchase or provision of any such gratuity, pension or allowance.

28.4 The Directors may exercise all the powers of the Company to borrow money and to mortgage or charge its undertaking, property and assets (present and future) and uncalled capital or any part thereof and to issue debentures, debenture stock, mortgages, bonds and other such securities whether outright or as security for any debt, liability or obligation of the Company or of any third party.

29 Appointment and Removal of Directors

29.1 Prior to the closing of a Business Combination, the Company may by Ordinary Resolution of the holders of the Class B Shares appoint any person to be a Director or may by Ordinary Resolution of the holders of the Class B Shares remove any Director. For the avoidance of doubt, prior to the closing of a Business Combination, holders of Class A Shares shall have no right to vote on the appointment or removal of any Director.

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29.2 The Directors may appoint any person to be a Director, either to fill a vacancy or as an additional Director provided that the appointment does not cause the number of Directors to exceed any number fixed by or in accordance with the Articles as the maximum number of Directors.

29.3 After the closing of a Business Combination, the Company may by Ordinary Resolution appoint any person to be a Director or may by Ordinary Resolution remove any Director.

29.4 Prior to the closing of a Business Combination, Article 29.1 may only be amended by a Special Resolution passed by at least 90 per cent of such Members as, being entitled to do so, vote in person or, where proxies are allowed, by proxy at a general meeting of which notice specifying the intention to propose the resolution as a special resolution has been given, or by way of unanimous written resolution.

30 Vacation of Office of Director

The office of a Director shall be vacated if:

(a) the Director gives notice in writing to the Company that he resigns the office of Director; or

(b) the Director absents himself (for the avoidance of doubt, without being represented by proxy) from three consecutive meetings of the board of Directors without special leave of absence from the Directors, and the Directors pass a resolution that he has by reason of such absence vacated office; or

(c) the Director dies, becomes bankrupt or makes any arrangement or composition with his creditors generally; or

(d) the Director is found to be or becomes of unsound mind; or

(e) all of the other Directors (being not less than two in number) determine that he should be removed as a Director, either by a resolution passed by all of the other Directors at a meeting of the Directors duly convened and held in accordance with the Articles or by a resolution in writing signed by all of the other Directors.

31 Proceedings of Directors

31.1 The quorum for the transaction of the business of the Directors may be fixed by the Directors, and unless so fixed shall be two if there are two or more Directors, and shall be one if there is only one Director.

31.2 Subject to the provisions of the Articles, the Directors may regulate their proceedings as they think fit. Questions arising at any meeting shall be decided by a majority of votes. In the case of an equality of votes, the chairman shall have a second or casting vote.

31.3 A person may participate in a meeting of the Directors or any committee of Directors by conference telephone or other communications equipment by means of which all the persons participating in the meeting can communicate with each other at the same time. Participation by a person in a meeting in this manner is treated as presence in person at that meeting. Unless otherwise determined by the Directors, the meeting shall be deemed to be held at the place where the chairman is located at the start of the meeting.



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31.4 A resolution in writing (in one or more counterparts) signed by all the Directors or all the members of a committee of the Directors or, in the case of a resolution in writing relating to the removal of any Director or the vacation of office by any Director, all of the Directors other than the Director who is the subject of such resolution shall be as valid and effectual as if it had been passed at a meeting of the Directors, or committee of Directors as the case may be, duly convened and held.

31.5 A Director may, or other Officer on the direction of a Director shall, call a meeting of the Directors by at least two days' notice in writing to every Director which notice shall set forth the general nature of the business to be considered unless notice is waived by all the Directors either at, before or after the meeting is held. To any such notice of a meeting of the Directors all the provisions of the Articles relating to the giving of notices by the Company to the Members shall apply *mutatis mutandis*.

31.6 The continuing Directors (or a sole continuing Director, as the case may be) may act notwithstanding any vacancy in their body, but if and so long as their number is reduced below the number fixed by or pursuant to the Articles as the necessary quorum of Directors the continuing Directors or Director may act for the purpose of increasing the number of Directors to be equal to such fixed number, or of summoning a general meeting of the Company, but for no other purpose.

31.7 The Directors may elect a chairman of their board and determine the period for which he is to hold office; but if no such chairman is elected, or if at any meeting the chairman is not present within five minutes after the time appointed for the meeting to commence, the Directors present may choose one of their number to be chairman of the meeting.

31.8 All acts done by any meeting of the Directors or of a committee of the Directors shall, notwithstanding that it is afterwards discovered that there was some defect in the appointment of any Director, and/or that they or any of them were disqualified, and/or had vacated their office and/or were not entitled to vote, be as valid as if every such person had been duly appointed and/or not disqualified to be a Director and/or had not vacated their office and/or had been entitled to vote, as the case may be.

31.9 A Director may be represented at any meetings of the board of Directors by a proxy appointed in writing by him. The proxy shall count towards the quorum and the vote of the proxy shall for all purposes be deemed to be that of the appointing Director.

32 Presumption of Assent

A Director who is present at a meeting of the board of Directors at which action on any Company matter is taken shall be presumed to have assented to the action taken unless his dissent shall be entered in the minutes of the meeting or unless he shall file his written dissent from such action with the person acting as the chairman or secretary of the meeting before the adjournment thereof or shall forward such dissent by registered post to such person immediately after the adjournment of the meeting. Such right to dissent shall not apply to a Director who voted in favour of such action.

33 Directors' Interests

33.1 A Director may hold any other office or place of profit under the Company (other than the office of Auditor) in conjunction with his office of Director for such period and on such terms as to remuneration and otherwise as the Directors may determine.

33.2 A Director may act by himself or by, through or on behalf of his firm in a professional capacity for the Company and he or his firm shall be entitled to remuneration for professional services as if he were not a Director.



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33.3 A Director may be or become a director or other officer of or otherwise interested in any company promoted by the Company or in which the Company may be interested as a shareholder, a contracting party or otherwise, and no such Director shall be accountable to the Company for any remuneration or other benefits received by him as a director or officer of, or from his interest in, such other company.

33.4 No person shall be disqualified from the office of Director or prevented by such office from contracting with the Company, either as vendor, purchaser or otherwise, nor shall any such contract or any contract or transaction entered into by or on behalf of the Company in which any Director shall be in any way interested be or be liable to be avoided, nor shall any Director so contracting or being so interested be liable to account to the Company for any profit realised by or arising in connection with any such contract or transaction by reason of such Director holding office or of the fiduciary relationship thereby established. A Director shall be at liberty to vote in respect of any contract or transaction in which he is interested provided that the nature of the interest of any Director in any such contract or transaction shall be disclosed by him at or prior to its consideration and any vote thereon.

33.5 A general notice that a Director is a shareholder, director, officer or employee of any specified firm or company and is to be regarded as interested in any transaction with such firm or company shall be sufficient disclosure for the purposes of voting on a resolution in respect of a contract or transaction in which he has an interest, and after such general notice it shall not be necessary to give special notice relating to any particular transaction.

34 Minutes

The Directors shall cause minutes to be made in books kept for the purpose of recording all appointments of Officers made by the Directors, all proceedings at meetings of the Company or the holders of any class of Shares and of the Directors, and of committees of the Directors, including the names of the Directors present at each meeting.

35 Delegation of Directors' Powers

35.1 The Directors may delegate any of their powers, authorities and discretions, including the power to sub-delegate, to any committee consisting of one or more Directors (including, without limitation, the Audit Committee, the Compensation Committee and the Nominating and Corporate Governance Committee). Any such delegation may be made subject to any conditions the Directors may impose and either collaterally with or to the exclusion of their own powers and any such delegation may be revoked or altered by the Directors. Subject to any such conditions, the proceedings of a committee of Directors shall be governed by the Articles regulating the proceedings of Directors, so far as they are capable of applying.

35.2 The Directors may establish any committees, local boards or agencies or appoint any person to be a manager or agent for managing the affairs of the Company and may appoint any person to be a member of such committees, local boards or agencies. Any such appointment may be made subject to any conditions the Directors may impose, and either collaterally with or to the exclusion of their own powers and any such appointment may be revoked or altered by the Directors. Subject to any such conditions, the proceedings of any such committee, local board or agency shall be governed by the Articles regulating the proceedings of Directors, so far as they are capable of applying.

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35.3 The Directors may adopt formal written charters for committees. Each of these committees shall be empowered to do all things necessary to exercise the rights of such committee set forth in the Articles and shall have such powers as the Directors may delegate pursuant to the Articles and as required by the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law. Each of the Audit Committee, the Compensation Committee and the Nominating and Corporate Governance Committee, if established, shall consist of such number of Directors as the Directors shall from time to time determine (or such minimum number as may be required from time to time by the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law).

35.4 The Directors may by power of attorney or otherwise appoint any person to be the agent of the Company on such conditions as the Directors may determine, provided that the delegation is not to the exclusion of their own powers and may be revoked by the Directors at any time.

35.5 The Directors may by power of attorney or otherwise appoint any company, firm, person or body of persons, whether nominated directly or indirectly by the Directors, to be the attorney or authorised signatory of the Company for such purpose and with such powers, authorities and discretions (not exceeding those vested in or exercisable by the Directors under the Articles) and for such period and subject to such conditions as they may think fit, and any such powers of attorney or other appointment may contain such provisions for the protection and convenience of persons dealing with any such attorneys or authorised signatories as the Directors may think fit and may also authorise any such attorney or authorised signatory to delegate all or any of the powers, authorities and discretions vested in him.

35.6 The Directors may appoint such Officers as they consider necessary on such terms, at such remuneration and to perform such duties, and subject to such provisions as to disqualification and removal as the Directors may think fit. Unless otherwise specified in the terms of his appointment an Officer may be removed by resolution of the Directors or Members. An Officer may vacate his office at any time if he gives notice in writing to the Company that he resigns his office.

36 No Minimum Shareholding

The Company in general meeting may fix a minimum shareholding required to be held by a Director, but unless and until such a shareholding qualification is fixed a Director is not required to hold Shares.

37 Remuneration of Directors

37.1 The remuneration to be paid to the Directors, if any, shall be such remuneration as the Directors shall determine, provided that no remuneration shall be paid to any Director by the Company prior to the consummation of a Business Combination. The Directors shall also, whether prior to or after the consummation of a Business Combination, be entitled to be paid all travelling, hotel and other expenses properly incurred by them in connection with their attendance at meetings of Directors or committees of Directors, or general meetings of the Company, or separate meetings of the holders of any class of Shares or debentures of the Company, or otherwise in connection with the business of the Company or the discharge of their duties as a Director, or to receive a fixed allowance in respect thereof as may be determined by the Directors, or a combination partly of one such method and partly the other.

37.2 The Directors may by resolution approve additional remuneration to any Director for any services which in the opinion of the Directors go beyond his ordinary routine work as a Director. Any fees paid to a Director who is also counsel, attorney or solicitor to the Company, or otherwise serves it in a professional capacity shall be in addition to his remuneration as a Director.



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38 Seal

38.1 The Company may, if the Directors so determine, have a Seal. The Seal shall only be used by the authority of the Directors or of a committee of the Directors authorised by the Directors. Every instrument to which the Seal has been affixed shall be signed by at least one person who shall be either a Director or some Officer or other person appointed by the Directors for the purpose.

38.2 The Company may have for use in any place or places outside the Cayman Islands a duplicate Seal or Seals each of which shall be a facsimile of the common Seal of the Company and, if the Directors so determine, with the addition on its face of the name of every place where it is to be used.

38.3 A Director or Officer, representative or attorney of the Company may without further authority of the Directors affix the Seal over his signature alone to any document of the Company required to be authenticated by him under seal or to be filed with the Registrar of Companies in the Cayman Islands or elsewhere wheresoever.

39 Dividends, Distributions and Reserve

39.1 Subject to the Statute and this Article and except as otherwise provided by the rights attached to any Shares, the Directors may resolve to pay Dividends and other distributions on Shares in issue and authorise payment of the Dividends or other distributions out of the funds of the Company lawfully available therefor. A Dividend shall be deemed to be an interim Dividend unless the terms of the resolution pursuant to which the Directors resolve to pay such Dividend specifically state that such Dividend shall be a final Dividend. No Dividend or other distribution shall be paid except out of the realised or unrealised profits of the Company, out of the share premium account or as otherwise permitted by law.

39.2 Except as otherwise provided by the rights attached to any Shares, all Dividends and other distributions shall be paid according to the par value of the Shares that a Member holds. If any Share is issued on terms providing that it shall rank for Dividend as from a particular date, that Share shall rank for Dividend accordingly.

39.3 The Directors may deduct from any Dividend or other distribution payable to any Member all sums of money (if any) then payable by him to the Company on account of calls or otherwise.

39.4 The Directors may resolve that any Dividend or other distribution be paid wholly or partly by the distribution of specific assets and in particular (but without limitation) by the distribution of shares, debentures, or securities of any other company or in any one or more of such ways and where any difficulty arises in regard to such distribution, the Directors may settle the same as they think expedient and in particular may issue fractional Shares and may fix the value for distribution of such specific assets or any part thereof and may determine that cash payments shall be made to any Members upon the basis of the value so fixed in order to adjust the rights of all Members and may vest any such specific assets in trustees in such manner as may seem expedient to the Directors.

39.5 Except as otherwise provided by the rights attached to any Shares, Dividends and other distributions may be paid in any currency. The Directors may determine the basis of conversion for any currency conversions that may be required and how any costs involved are to be met.

39.6 The Directors may, before resolving to pay any Dividend or other distribution, set aside such sums as they think proper as a reserve or reserves which shall, at the discretion of the Directors, be applicable for any purpose of the Company and pending such application may, at the discretion of the Directors, be employed in the business of the Company.



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39.7 Any Dividend, other distribution, interest or other monies payable in cash in respect of Shares may be paid by wire transfer to the holder or by cheque or warrant sent through the post directed to the registered address of the holder or, in the case of joint holders, to the registered address of the holder who is first named on the Register of Members or to such person and to such address as such holder or joint holders may in writing direct. Every such cheque or warrant shall be made payable to the order of the person to whom it is sent. Any one of two or more joint holders may give effectual receipts for any Dividends, other distributions, bonuses, or other monies payable in respect of the Share held by them as joint holders.

39.8 No Dividend or other distribution shall bear interest against the Company.

39.9 Any Dividend or other distribution which cannot be paid to a Member and/or which remains unclaimed after six months from the date on which such Dividend or other distribution becomes payable may, in the discretion of the Directors, be paid into a separate account in the Company's name, provided that the Company shall not be constituted as a trustee in respect of that account and the Dividend or other distribution shall remain as a debt due to the Member. Any Dividend or other distribution which remains unclaimed after a period of six years from the date on which such Dividend or other distribution becomes payable shall be forfeited and shall revert to the Company.

40 Capitalisation

The Directors may at any time capitalise any sum standing to the credit of any of the Company's reserve accounts or funds (including the share premium account and capital redemption reserve fund) or any sum standing to the credit of the profit and loss account or otherwise available for distribution; appropriate such sum to Members in the proportions in which such sum would have been divisible amongst such Members had the same been a distribution of profits by way of Dividend or other distribution; and apply such sum on their behalf in paying up in full unissued Shares for allotment and distribution credited as fully paid-up to and amongst them in the proportion aforesaid. In such event the Directors shall do all acts and things required to give effect to such capitalisation, with full power given to the Directors to make such provisions as they think fit in the case of Shares becoming distributable in fractions (including provisions whereby the benefit of fractional entitlements accrue to the Company rather than to the Members concerned). The Directors may authorise any person to enter on behalf of all of the Members interested into an agreement with the Company providing for such capitalisation and matters incidental or relating thereto and any agreement made under such authority shall be effective and binding on all such Members and the Company.

41 Books of Account

41.1 The Directors shall cause proper books of account (including, where applicable, material underlying documentation including contracts and invoices) to be kept with respect to all sums of money received and expended by the Company and the matters in respect of which the receipt or expenditure takes place, all sales and purchases of goods by the Company and the assets and liabilities of the Company. Such books of account must be retained for a minimum period of five years from the date on which they are prepared. Proper books shall not be deemed to be kept if there are not kept such books of account as are necessary to give a true and fair view of the state of the Company's affairs and to explain its transactions.



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41.2 The Directors shall determine whether and to what extent and at what times and places and under what conditions or regulations the accounts and books of the Company or any of them shall be open to the inspection of Members not being Directors and no Member (not being a Director) shall have any right of inspecting any account or book or document of the Company except as conferred by Statute or authorised by the Directors or by the Company in general meeting.

41.3 The Directors may cause to be prepared and to be laid before the Company in general meeting profit and loss accounts, balance sheets, group accounts (if any) and such other reports and accounts as may be required by law.

42 Audit

42.1 The Directors may appoint an Auditor of the Company who shall hold office on such terms as the Directors determine.

42.2 Without prejudice to the freedom of the Directors to establish any other committee, if the Shares (or depositary receipts therefor) are listed or quoted on the Designated Stock Exchange, and if required by the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law, the Directors shall establish and maintain an Audit Committee as a committee of the Directors and shall adopt a formal written Audit Committee charter and review and assess the adequacy of the formal written charter on an annual basis. The composition and responsibilities of the Audit Committee shall comply with the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or otherwise under Applicable Law.

42.3 If the Shares (or depositary receipts therefor) are listed or quoted on the Designated Stock Exchange, the Company shall conduct an appropriate review of all related party transactions on an ongoing basis and shall utilise the Audit Committee for the review and approval of potential conflicts of interest.

42.4 The remuneration of the Auditor shall be fixed by the Audit Committee (if one exists).

42.5 If the office of Auditor becomes vacant by resignation or death of the Auditor, or by his becoming incapable of acting by reason of illness or other disability at a time when his services are required, the Directors shall fill the vacancy and determine the remuneration of such Auditor.

42.6 Every Auditor of the Company shall have a right of access at all times to the books and accounts and vouchers of the Company and shall be entitled to require from the Directors and Officers such information and explanation as may be necessary for the performance of the duties of the Auditor.

42.7 Auditors shall, if so required by the Directors, make a report on the accounts of the Company during their tenure of office at the next annual general meeting following their appointment in the case of a company which is registered with the Registrar of Companies as an ordinary company, and at the next extraordinary general meeting following their appointment in the case of a company which is registered with the Registrar of Companies as an exempted company, and at any other time during their term of office, upon request of the Directors or any general meeting of the Members.



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43 Notices

43.1 Notices shall be in writing and may be given by the Company to any Member either personally or by sending it by courier, post, cable, telex, fax or e-mail to him or to his address as shown in the Register of Members (or where the notice is given by e-mail by sending it to the e-mail address provided by such Member). Notice may also be served by Electronic Communication in accordance with the rules and regulations of the Designated Stock Exchange, the Securities and Exchange Commission and/or any other competent regulatory authority or by placing it on the Company's Website.

43.2 Where a notice is sent by:

(a) courier; service of the notice shall be deemed to be effected by delivery of the notice to a courier company, and shall be deemed to have been received on the third day (not including Saturdays or Sundays or public holidays) following the day on which the notice was delivered to the courier;

(b) post; service of the notice shall be deemed to be effected by properly addressing, pre paying and posting a letter containing the notice, and shall be deemed to have been received on the fifth day (not including Saturdays or Sundays or public holidays in the Cayman Islands) following the day on which the notice was posted;

(c) cable, telex or fax; service of the notice shall be deemed to be effected by properly addressing and sending such notice and shall be deemed to have been received on the same day that it was transmitted;

(d) e-mail or other Electronic Communication; service of the notice shall be deemed to be effected by transmitting the e-mail to the e-mail address provided by the intended recipient and shall be deemed to have been received on the same day that it was sent, and it shall not be necessary for the receipt of the e-mail to be acknowledged by the recipient; and

(e) placing it on the Company's Website; service of the notice shall be deemed to have been effected one hour after the notice or document was placed on the Company's Website.

43.3 A notice may be given by the Company to the person or persons which the Company has been advised are entitled to a Share or Shares in consequence of the death or bankruptcy of a Member in the same manner as other notices which are required to be given under the Articles and shall be addressed to them by name, or by the title of representatives of the deceased, or trustee of the bankrupt, or by any like description at the address supplied for that purpose by the persons claiming to be so entitled, or at the option of the Company by giving the notice in any manner in which the same might have been given if the death or bankruptcy had not occurred.

43.4 Notice of every general meeting shall be given in any manner authorised by the Articles to every holder of Shares carrying an entitlement to receive such notice on the record date for such meeting except that in the case of joint holders the notice shall be sufficient if given to the joint holder first named in the Register of Members and every person upon whom the ownership of a Share devolves by reason of his being a legal personal representative or a trustee in bankruptcy of a Member where the Member but for his death or bankruptcy would be entitled to receive notice of the meeting, and no other person shall be entitled to receive notices of general meetings.



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44 Winding Up

44.1 If the Company shall be wound up, the liquidator shall apply the assets of the Company in satisfaction of creditors' claims in such manner and order as such liquidator thinks fit. Subject to the rights attaching to any Shares, in a winding up:

(a) if the assets available for distribution amongst the Members shall be insufficient to repay the whole of the Company's issued share capital, such assets shall be distributed so that, as nearly as may be, the losses shall be borne by the Members in proportion to the par value of the Shares held by them; or

(b) if the assets available for distribution amongst the Members shall be more than sufficient to repay the whole of the Company's issued share capital at the commencement of the winding up, the surplus shall be distributed amongst the Members in proportion to the par value of the Shares held by them at the commencement of the winding up subject to a deduction from those Shares in respect of which there are monies due, of all monies payable to the Company for unpaid calls or otherwise.

44.2 If the Company shall be wound up the liquidator may, subject to the rights attaching to any Shares and with the approval of a Special Resolution of the Company and any other approval required by the Statute, divide amongst the Members in kind the whole or any part of the assets of the Company (whether such assets shall consist of property of the same kind or not) and may for that purpose value any assets and determine how the division shall be carried out as between the Members or different classes of Members. The liquidator may, with the like approval, vest the whole or any part of such assets in trustees upon such trusts for the benefit of the Members as the liquidator, with the like approval, shall think fit, but so that no Member shall be compelled to accept any asset upon which there is a liability.

45 Indemnity and Insurance

45.1 Every Director and Officer (which for the avoidance of doubt, shall not include auditors of the Company), together with every former Director and former Officer (each an "**Indemnified Person**") shall be indemnified out of the assets of the Company against any liability, action, proceeding, claim, demand, costs, damages or expenses, including legal expenses, whatsoever which they or any of them may incur as a result of any act or failure to act in carrying out their functions other than such liability (if any) that they may incur by reason of their own actual fraud, wilful neglect or wilful default. No Indemnified Person shall be liable to the Company for any loss or damage incurred by the Company as a result (whether direct or indirect) of the carrying out of their functions unless that liability arises through the actual fraud, wilful neglect or wilful default of such Indemnified Person. No person shall be found to have committed actual fraud, wilful neglect or wilful default under this Article unless or until a court of competent jurisdiction shall have made a finding to that effect.

45.2 The Company shall advance to each Indemnified Person reasonable attorneys' fees and other costs and expenses incurred in connection with the defence of any action, suit, proceeding or investigation involving such Indemnified Person for which indemnity will or could be sought. In connection with any advance of any expenses hereunder, the Indemnified Person shall execute an undertaking to repay the advanced amount to the Company if it shall be determined by final judgment or other final adjudication that such Indemnified Person was not entitled to indemnification pursuant to this Article. If it shall be determined by a final judgment or other final adjudication that such Indemnified Person was not entitled to indemnification with respect to such judgment, costs or expenses, then such party shall not be indemnified with respect to such judgment, costs or expenses and any advancement shall be returned to the Company (without interest) by the Indemnified Person.



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45.3 The Directors, on behalf of the Company, may purchase and maintain insurance for the benefit of any Director or Officer against any liability which, by virtue of any rule of law, would otherwise attach to such person in respect of any negligence, default, breach of duty or breach of trust of which such person may be guilty in relation to the Company.

46 Financial Year

Unless the Directors otherwise prescribe, the financial year of the Company shall end on 31st December in each year and, following the year of incorporation, shall begin on 1st January in each year.

47 Transfer by Way of Continuation

If the Company is exempted as defined in the Statute, it shall, subject to the provisions of the Statute and with the approval of a Special Resolution, have the power to register by way of continuation as a body corporate under the laws of any jurisdiction outside the Cayman Islands and to be deregistered in the Cayman Islands.

48 Mergers and Consolidations

The Company shall have the power to merge or consolidate with one or more other constituent companies (as defined in the Statute) upon such terms as the Directors may determine and (to the extent required by the Statute) with the approval of a Special Resolution.

49 Business Combination

49.1 Notwithstanding any other provision of the Articles, this Article shall apply during the period commencing upon the adoption of the Articles and terminating upon the first to occur of the consummation of a Business Combination and the full distribution of the Trust Account pursuant to this Article. In the event of a conflict between this Article and any other Articles, the provisions of this Article shall prevail.

49.2 Prior to the consummation of a Business Combination, the Company shall either:

(a) submit such Business Combination to its Members for approval; or

(b) provide Members with the opportunity to have their Shares repurchased by means of a tender offer for a per-Share repurchase price payable in cash, equal to the aggregate amount then on deposit in the Trust Account, calculated as of two business days prior to the consummation of such Business Combination, including interest earned on the Trust Account (which interest shall be net of taxes paid or payable, if any) divided by the number of then issued Public Shares, provided that the Company shall not repurchase Public Shares in an amount that would cause the Company's net tangible assets to be less than US$5,000,001 following such repurchases. Such obligation to purchase Shares is subject to the completion of the proposed Business Combination to which it relates.

49.3 If the Company initiates any tender offer in accordance with Rule 13e-4 and Regulation 14E of the Exchange Act in connection with a proposed Business Combination, it shall file tender offer documents with the Securities and Exchange Commission prior to completing such Business Combination which contain substantially the same financial and other information about such Business Combination and the redemption rights as is required under Regulation 14A of the Exchange Act. If, alternatively, the Company holds a general meeting to approve a proposed Business Combination, the Company will conduct any redemptions in conjunction with a proxy solicitation pursuant to Regulation 14A of the Exchange Act, and not pursuant to the tender offer rules, and file proxy materials with the Securities and Exchange Commission.



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49.4 At a general meeting called for the purposes of approving a Business Combination pursuant to this Article, in the event that such Business Combination is approved by Ordinary Resolution, the Company shall be authorised to consummate such Business Combination, provided that the Company shall not consummate such Business Combination unless the Company has net tangible assets of at least US$5,000,001 immediately prior to, or upon such consummation of, or any greater net tangible asset or cash requirement that may be contained in the agreement relating to, such Business Combination.

49.5 Any Member holding Public Shares who is not the Sponsor, a Founder, Officer or Director may, at least two business days' prior to the initially scheduled vote on a Business Combination, elect to have their Public Shares redeemed for cash (the "**IPO Redemption**"), provided that no such Member acting together with any Affiliate of his or any other person with whom he is acting in concert or as a partnership, limited partnership, syndicate, or other group for the purposes of acquiring, holding, or disposing of Shares may exercise this redemption right with respect to more than 15 per cent of the Public Shares in the aggregate without the prior consent of the Company, and provided further that any beneficial owner of Public Shares on whose behalf a redemption right is being exercised must identify itself to the Company in connection with any redemption election in order to validly redeem such Public Shares. If so demanded, the Company shall pay any such redeeming Member, regardless of whether he votes or is voting for or against such proposed Business Combination, a per-Share redemption price payable in cash, equal to the aggregate amount then on deposit in the Trust Account calculated as of two business days prior to the consummation of the Business Combination, including interest earned on the Trust Account and not previously released to the Company to pay its taxes, divided by the number of then issued Public Shares (such redemption price being referred to herein as the "**Redemption Price**"), but only in the event that the applicable proposed Business Combination is approved and consummated. The Company shall not redeem Public Shares that would cause the Company's net tangible assets to be less than US$5,000,001 following such redemptions (the "**Redemption Limitation**").

49.6 A Member may not withdraw a Redemption Notice following the deadline for such Redemption Notice once submitted to the Company unless the Directors determine (in their sole discretion) to permit the withdrawal of such redemption request (which they may do in whole or in part).

49.7 In the event that the Company does not consummate a Business Combination within 18 months from the consummation of the IPO, or such later time as the Members may approve in accordance with the Articles, the Company shall:

(a) cease all operations except for the purpose of winding up;

(b) as promptly as reasonably possible but not more than ten business days thereafter, redeem the Public Shares, at a per-Share price, payable in cash, equal to the aggregate amount then on deposit in the Trust Account, including interest earned on the funds held in the Trust Account and not previously released to the Company (less taxes payable and up to US$100,000 of interest to pay dissolution expenses), divided by the number of then Public Shares in issue, which redemption will completely extinguish public Members' rights as Members (including the right to receive further liquidation distributions, if any); and

(c) as promptly as reasonably possible following such redemption, subject to the approval of the Company's remaining Members and the Directors, liquidate and dissolve, subject in the case of (b) and (c) above to its obligations under Cayman Islands law to provide for claims of creditors and in all cases subject to the other requirements of Applicable Law.



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49.8 In the event that any amendment is made to this Article that would affect the substance or timing of the Company's obligation to:

(a) provide for the redemption of the Public Shares in connection with a Business Combination; or

(b) redeem 100 per cent of the Public Shares if the Company has not consummated a Business Combination within 18 months from the consummation of the IPO, or such later time as the Members may approve in accordance with the Articles,

each holder of Public Shares who is not the Sponsor, a Founder, Officer or Director shall be provided with the opportunity to redeem their Public Shares upon the approval or effectiveness of any such amendment at a per-Share price, payable in cash, equal to the aggregate amount then on deposit in the Trust Account, including interest earned on the funds held in the Trust Account and not previously released to the Company to pay its taxes, divided by the number of then outstanding Public Shares. The Company's ability to provide such redemption in this Article is subject to the Redemption Limitation.

49.9 A holder of Public Shares shall be entitled to receive distributions from the Trust Account only in the event of an IPO Redemption, a repurchase of Shares by means of a tender offer pursuant to this Article**Error! Reference source not found.**, or a distribution of the Trust Account pursuant to this Article. In no other circumstance shall a holder of Public Shares have any right or interest of any kind in the Trust Account.

49.10 After the issue of Public Shares, and prior to the consummation of a Business Combination, the Company shall not issue additional Shares or any other securities that would entitle the holders thereof to:

(a) receive funds from the Trust Account; or

(b) vote as a class with Public Shares on a Business Combination.

49.11 A Director may vote in respect of a Business Combination in which such Director has a conflict of interest with respect to the evaluation of such Business Combination. Such Director must disclose such interest or conflict to the other Directors.

49.12 As long as the Company's securities are listed on the Designated Stock Exchange, the Company must complete one or more Business Combinations having an aggregate fair market value equal to at least 80 percent of the assets held in the Trust Account (net of amounts previously disbursed to the Company's management for taxes and excluding the amount of deferred underwriting discounts held in the Trust Account) at the time of the Company's signing a definitive agreement in connection with a Business Combination. A Business Combination must not be effectuated with another blank cheque company or a similar company with nominal operations

49.13 The Company may enter into a Business Combination with a target business that is Affiliated with the Sponsor, a Founder, a Director or an Officer. In the event the Company seeks to complete a Business Combination with a target that is Affiliated with the Sponsor, a Founder, a Director or an Officer, the Company, or a committee of Independent Directors, will obtain an opinion from an independent investment banking firm or another valuation or appraisal firm that regularly renders fairness opinions on the type of target business the Company is seeking to acquire that such a Business Combination is fair to the Company from a financial point of view.

GENERAL REGISTRY CAYMAN ISLANDS
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50 Business Opportunities

50.1 To the fullest extent permitted by Applicable Law, no individual serving as a Director or an Officer ("**Management**") shall have any duty, except and to the extent expressly assumed by contract, to refrain from engaging directly or indirectly in the same or similar business activities or lines of business as the Company. To the fullest extent permitted by Applicable Law, the Company renounces any interest or expectancy of the Company in, or in being offered an opportunity to participate in, any potential transaction or matter which may be a corporate opportunity for Management, on the one hand, and the Company, on the other. Except to the extent expressly assumed by contract, to the fullest extent permitted by Applicable Law, Management shall have no duty to communicate or offer any such corporate opportunity to the Company and shall not be liable to the Company or its Members for breach of any fiduciary duty as a Member, Director and/or Officer solely by reason of the fact that such party pursues or acquires such corporate opportunity for itself, himself or herself, directs such corporate opportunity to another person, or does not communicate information regarding such corporate opportunity to the Company.

50.2 Except as provided elsewhere in this Article, the Company hereby renounces any interest or expectancy of the Company in, or in being offered an opportunity to participate in, any potential transaction or matter which may be a corporate opportunity for both the Company and Management, about which a Director and/or Officer who is also a member of Management acquires knowledge.

50.3 To the extent a court might hold that the conduct of any activity related to a corporate opportunity that is renounced in this Article to be a breach of duty to the Company or its Members, the Company hereby waives, to the fullest extent permitted by Applicable Law, any and all claims and causes of action that the Company may have for such activities. To the fullest extent permitted by Applicable Law, the provisions of this Article apply equally to activities conducted in the future and that have been conducted in the past.

GENERAL REGISTRY CAYMAN ISLANDS

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ANNEX J

PLAN OF ARRANGEMENT
UNDER SECTION 288 OF THE
***BUSINESS CORPORATIONS ACT* (BRITISH COLUMBIA)**

ARTICLE 1
INTERPRETATION

1.1 In this Plan of Arrangement, any capitalized term used herein and not defined in this Section 1.1 will have the meaning ascribed thereto in the Business Combination Agreement. Unless the context otherwise requires, the following words and phrases used in this Plan of Arrangement will have the meanings hereinafter set out:

"**Affected Securities**" means, collectively, the Company Common Shares, the Company Preferred Shares and the Company Options;

"**Affected Securityholders**" means, collectively, the Company Shareholders and the Company Optionholders;

"**Allocation Schedule**" means the allocation schedule to be delivered no later than five (5) Business Days prior to the Effective Date by the Company to SOAC (and to be delivered by SOAC to the Exchange Agent thereafter) in accordance with Section 2.4 of the Business Combination Agreement;

"**Amalco**" has the meaning ascribed thereto in Section 3.1(e) of this Plan of Arrangement;

"**Amalco Shares**" means the common shares in the capital of Amalco;

"**Amalgamation**" has the meaning ascribed thereto in Section 3.1(e) of this Plan of Arrangement;

"**Arrangement**" means the arrangement under Part 9, Division 5 of the BCBCA on the terms and subject to the conditions set out in this Plan of Arrangement, subject to any amendments or variations thereto made in accordance with the terms of the Business Combination Agreement or Article 7 of this Plan of Arrangement or made at the direction of the Court in the Final Order with the prior written consent of SOAC and the Company, such consent not to be unreasonably withheld, conditioned or delayed;

"**Arrangement Dissent Rights**" has the meaning ascribed thereto in Section 4.1 of this Plan of Arrangement;

"**Assumed Plan**" has the meaning ascribed thereto in Section 3.1(c)(i) of this Plan of Arrangement;

"**BCBCA**" means the *Business Corporations Act* (British Columbia) and the regulations made thereunder, as now in effect and as they may be promulgated or amended from time to time;

"**Business Combination Agreement**" means the business combination agreement made as of March 4, 2021 by and among SOAC, NewCo Sub and the Company, including all schedules annexed thereto, as the same may be amended, supplemented or otherwise modified from time to time in accordance with the terms thereof;

"**Business Day**" means a day, other than a Saturday or Sunday, on which commercial banks in New York, New York and Vancouver, British Columbia are open for the general transaction of business;

"**Code**" means the U.S. Internal Revenue Code of 1986, as amended;

"**Company**" means DeepGreen Metals Inc., a company existing under the laws of the Province of British Columbia;

"**Company Arrangement Resolution**" means the special resolution of the Affected Securityholders approving the Plan of Arrangement which is to be considered at the Company Shareholders Meeting, substantially in the form of Exhibit A to the Business Combination Agreement;

"**Company Common Shares**" means the common shares in the capital of the Company (including, for greater certainty, any Company Common Shares issued in connection with the Preferred Share Conversion and the Convertible Debenture Conversion);

"**Company Common Shareholders**" means, at any time, the holders of Company Common Shares issued and outstanding at such time and "**Company Common Shareholder**" means any one of them;

"**Company Equity Plan**" means the Company stock option plan currently in effect (as amended from time to time) and each other plan that provides for the award to any current or former director, manager, officer, employee, individual independent contractor, consultant or other service provider of any Group Company of rights of any kind to receive Equity Securities of any Group Company or benefits measured in whole or in part by reference to Equity Securities of any Group Company;

"**Company Optionholders**" means, at any time, the holders of Company Options outstanding at such time and "**Company Optionholder**" means any one of them;

"**Company Options**" means, as of any determination time, each option to purchase Company Common Shares that is outstanding and unexercised, whether vested or unvested, granted under the Company Equity Plan;

"**Company Preferred Shareholders**" means, at any time, the holders of Company Preferred Shares issued and outstanding at such time and "**Company Preferred Shareholder**" means any one of them;

"**Company Preferred Shares**" means the Class B Preferred Shares in the capital of the Company;

"**Company Shareholders**" means, at any time, the holders of Company Common Shares, Company Preferred Shares or both, in each case issued and outstanding at such time and "**Company Shareholder**" means any one of them;

"**Company Shareholders Meeting**" means the special meeting of the Affected Securityholders, including any adjournment or postponement thereof in accordance with the terms of the Business Combination Agreement, that is to be convened as provided by the Interim Order to consider, and if deemed advisable, approve, the Company Arrangement Resolution, and for any other purpose as may be set out in the Company Information Circular and agreed to by SOAC;

"**Company Shares**" means, collectively, the Company Common Shares and the Company Preferred Shares;

"**Court**" means the Supreme Court of British Columbia;

"**Dissenting Shareholders**" means a registered Company Shareholder (other than a Supporting Company Shareholder) who exercises Arrangement Dissent Rights in respect of the Company Arrangement Resolution in compliance with the dissent procedures set out in this Plan of Arrangement and the Interim Order or the BCBCA, as applicable, and who has not withdrawn or been deemed to have withdrawn such exercise of Arrangement Dissent Rights;

"**Earnout Shares**" means (i) 5,000,000 Class A Special Shares, (ii) 10,000,000 Class B Special Shares, (iii) 10,000,000 Class C Special Shares, (iv) 20,000,000 Class D Special Shares, (v) 20,000,000 Class E Special Shares, (vi) 20,000,000 Class F Special Shares, (vii) 25,000,000 Class G Special Shares, and (viii) 25,000,000 Class H Special Shares, in each case, in the capital of SOAC following the SOAC Continuance, convertible into SOAC Common Shares and redeemable in accordance with their terms;

"**Effective Date**" means the date upon which the Arrangement becomes effective as provided in this Plan of Arrangement;

"**Effective Time**" means 12:00 p.m. (noon) (Vancouver time) on the Effective Date or such other time as the Company and SOAC may agree upon in writing;

"**Eligible Holder**" means a Company Shareholder that is (a) a resident of Canada for purposes of the Tax Act and not exempt from tax under Part I of the Tax Act, or (b) a partnership, any member of which is a resident of Canada for purposes of the Tax Act and not exempt from tax under Part I of the Tax Act;

"**Exchange Agent**" means such Person appointed by SOAC to act as exchange agent for the Company Shares in accordance with the Business Combination Agreement, reasonably acceptable to the Company, such acceptance not to be unreasonably withheld, conditioned or delayed;

"**Exchange Consideration**" means the number of SOAC Common Shares and Earnout Shares allocated to each Company Common Shareholder pursuant to the Allocation Schedule;

"**holder**", when used with reference to any securities of the Company, means the holder of such securities shown from time to time in the central securities register maintained by or on behalf of Company in respect of such securities;

"Interim Order" means the interim order of the Court contemplated by Section 2.1(a) of the Business Combination Agreement and made pursuant to Section 291 of the BCBCA, in a form acceptable to the Company and SOAC, each acting reasonably, providing for, among other things, the calling and holding of the Company Shareholders Meeting, as the same may be amended by the Court with the consent of the Company and SOAC, such consent not to be unreasonably withheld, conditioned or delayed, provided that any such amendment is reasonable acceptable to each of the Company and SOAC;

"**Letter of Transmittal**" means the letter of transmittal as mutually agreed by each of the Exchange Agent, SOAC and the Company as contemplated in the Business Combination Agreement;

"**NewCo Shares**" means the common shares in the capital of NewCo Sub;

"**NewCo Sub**" means 1291924 B.C. Unlimited Liability Company, an unlimited liability company formed under the laws of the Province of British Columbia;

"**Plan of Arrangement**" means this plan of arrangement and any amendments, supplements, modifications or variations hereto made in accordance with this Plan of Arrangement, the applicable provisions of the Business Combination Agreement, or upon the direction of the Court in the Final Order with the consent of the Company and SOAC, such consent not to be unreasonably withheld, conditioned or delayed;

"**Rollover Option**" has the meaning ascribed thereto in Section 3.1(c)(i) of this Plan of Arrangement;

"**SOAC**" means Sustainable Opportunities Acquisition Corp., a Cayman Islands exempted company, and any successor thereof continued under the BCBCA;

"**Supporting Company Shareholder**" means a Company Shareholder that executed and delivered to SOAC a transaction support agreement, substantially in the form of Exhibit E to the Business Combination Agreement; and

"**Tax Act**" means the *Income Tax Act* (Canada) and the regulations made thereunder, as now in effect and as they may be promulgated or amended from time to time.

1.2 In this Plan of Arrangement, unless otherwise expressly stated or the context otherwise requires:

(a) all references to Articles and Sections are to Articles and Sections of this Plan of Arrangement;

(b) time periods within or following which any payment is to be made or act is to be done will be calculated by excluding the day on which the period commences and including the day on which the period ends. If any action under this Plan of Arrangement is required to be done or taken on a day that is not a Business Day, then such action shall be required to be done or taken not on such day but on the first succeeding Business Day thereafter;

(c) the words, "herein," "hereto," "hereof" and words of similar import refer to this Plan of Arrangement as a whole, and not to any particular section, subsection, paragraph, subparagraph or clause set forth in this Plan of Arrangement;

(d) masculine gender shall also include the feminine and neutral genders, and vice versa;

(e) words importing the singular shall also include the plural, and vice versa;

(f) the word "or" is disjunctive but not necessarily exclusive;

(g) the words "include," "includes" or "including" shall be deemed to be followed by the words "without limitation";

(h) the word "extent" in the phrase "to the extent" means the degree of which a subject or other thing extends, and such phrase shall mean simply "if";

(i) all references to any Law will be to such Law as amended, supplemented or otherwise modified or re-enacted from time to time; and

(j) all references to cash or currency in this Plan of Arrangement are to United States dollars unless otherwise indicated.

ARTICLE 2
BUSINESS COMBINATION AGREEMENT

2.1 This Plan of Arrangement is made pursuant to and subject to the provisions of the Business Combination Agreement and constitutes an arrangement as referred to in Part 9, Division 5 of the BCBCA. If there is any inconsistency or conflict between the provisions of this Plan of Arrangement and the provisions of the Business Combination Agreement, the provisions of this Plan of Arrangement will govern.

2.2 This Plan of Arrangement and the Arrangement will become effective as at the Effective Time and will be binding without any further authorization, act or formality on the part of the Court or any Person, on the Affected Securityholders, SOAC, Newco Sub, the Company, Amalco and the Exchange Agent from and after the Effective Time.

ARTICLE 3
ARRANGEMENT

3.1 Commencing at the Effective Time, the following transactions will occur and will be deemed to occur at the times and in the order set out below without any further authorization, act or formality required on the part of any Person, except as otherwise expressly provided herein:

(a) At the Effective Time:

(i) each Company Common Share (including, for greater certainty, any Company Common Shares issued in connection with the Preferred Share Conversion and the Convertible Debenture Conversion), held by a Company Common Shareholder (other than a Dissenting Shareholder) immediately prior to the Effective Time will be transferred and assigned to SOAC free and clear of all Liens in consideration for the Exchange Consideration (provided that it shall be a condition to a Company Common Shareholder's entitlement to receive the Exchange Consideration that such Company Common Shareholder shall have executed and delivered the Letter of Transmittal);

(ii) each Company Common Shareholder will cease to have any rights as a registered holder of Company Common Shares other than the right to receive (A) the consideration contemplated by Section 3.1(a)(i), and (B) any dividends and other distributions payable in respect of the Company Common Shares as of the Effective Time, to the extent applicable, in each case less any amounts required to be withheld in accordance with Section 6.2, as applicable;

(iii) the name of each Company Common Shareholder will be removed as the registered holder of Company Common Shares from the applicable central securities register of the Company maintained by or on behalf of the Company and added as a registered holder of SOAC Common Shares and Earnout Shares, as applicable, on the applicable central securities registers of SOAC maintained by or on behalf of SOAC; and

(iv) SOAC will be recorded as the registered holder of the Company Common Shares so transferred and acquired in accordance with this Section 3.1(a) and will be deemed to be the legal and beneficial owner thereof free and clear of all Liens;

(b) one minute after the steps in Section 3.1(a):

(i) each Company Common Share held by a Dissenting Shareholder will be deemed to be transferred and assigned by such Dissenting Shareholder to the Company free and clear of all Liens, in accordance with, and for the consideration contemplated in, Article 4;

(ii) each Dissenting Shareholder will cease to have any rights as a registered holder of Company Common Shares other than the right to receive (A) the consideration contemplated by Article 4, and (B) any dividends and other distributions payable in respect of the Company Common Shares held by such Dissenting Shareholder as of the Effective Time, to the extent applicable, in each case less any amounts required to be withheld in accordance with Section 6.2, as applicable;

(iii) each Dissenting Shareholder shall be deemed to have executed and delivered all consents, releases, assignments and waivers, statutory or otherwise, required to transfer and assign each Company Common Shares held by such Dissenting Shareholder; and

(iv) the name of each Dissenting Shareholder will be removed as the registered holder of Company Common Shares from the applicable central securities register of the Company maintained by or on behalf of the Company, and at such time, such Dissenting Shareholder will have the rights set out in Section 4.1;

(c) one minute after the steps in Section 3.1(b):

(i) the Company Equity Plan will be assumed by SOAC and become a stock option plan of SOAC (the "**Assumed Plan**") and will continue in full force and effect without any amendments thereof (including with respect to vesting, expiration and forfeiture provisions), except such amendments required to take into account the Arrangement and securities laws and regulations applicable to SOAC;

(ii) each Company Option outstanding immediately prior to the Effective Time (whether vested or unvested) (each a "**Rollover Option**"), will be exchanged for options to purchase the number of SOAC Common Shares and Earnout Shares allocated to such Rollover Option pursuant to the Allocation Schedule and having the exercise price set forth therein, in each case in accordance with the Assumed Plan, and in a manner intended to comply with the requirements of Section 409A of the Code and subsection 7(1.4) of the Tax Act (provided that the exercise of the Rollover Options shall be conditional upon the holder of the Rollover Option executing an instrument providing the same covenants, agreements and undertakings in respect of the securities issuable on the exercise of the Rollover Options as those contained in the Letter of Transmittal in respect of the issuance of the Earnout Shares, which instrument shall be in a form reasonably acceptable to SOAC);

(iii) each Company Optionholder will cease to have any rights as a holder of Company Options other than the right to receive the consideration contemplated by Section 3.1(c)(ii);

(iv) the name of each Company Optionholder will be removed as the registered holder of Company Options from the applicable central securities register of the Company maintained by or on behalf of the Company and added as a registered holder of options under the Assumed Plan on the applicable central securities register of SOAC maintained by or on behalf of SOAC (subject to the condition set out in Section 3.1(c)(ii)); and

(v) any document previously evidencing Company Options will thereafter evidence and be deemed to evidence the Rollover Options exchanged therefor and no certificates evidencing the Rollover Options shall be required to be issued and the Rollover Options shall be governed by and be subject to such previously issued documents, other than as amended hereby; and

(d) one minute after the step in Section 3.1(c), the Company and NewCo Sub will amalgamate to continue as one corporate entity as an unlimited liability company (as so amalgamated, "**Amalco**"), with the same effect as if they were amalgamated under section 276 of the BCBCA (the "**Amalgamation**"). For greater certainty, the Parties intend that the Amalgamation qualify as (i) an "amalgamation" for purposes of subsection 87(1) of the Tax Act, and (ii) a "reorganization" within the meaning of Section 368(a) of the Code. On and after the Amalgamation:

(i) each Company Common Share outstanding immediately after the steps in Sections 3.1(a) and 3.1(b) will be exchanged for one Amalco Share, the holder of the Company Common Shares so exchanged will be added to the register of holders of Amalco Shares and the Company Common Shares so exchanged will be cancelled without any repayment of capital;

(ii) each NewCo Share outstanding immediately prior to the Effective Time will be exchanged for one Amalco Share, the holder of the NewCo Shares so exchanged will be added to the register of holders of Amalco Shares and the NewCo Shares so exchanged will be cancelled without any repayment of capital;

(iii) the name of Amalco will be DeepGreen Metals ULC, as to be set out in the notice of articles of Amalco;

(iv) the registered office of Amalco will be the same registered office as the Company, as to be set out in the notice of articles of Amalco;

(v) the notice of articles and the articles of Amalco will be in the form of the notice of articles, other than as to reflect Sections 3.1(d)(iii), 3.1(d)(iv), and 3.1(d)(vi), and the articles of NewCo Sub, as amended;

(vi) the first directors of Amalco will be the directors of the Company, as to be set out in the notice of articles of Amalco;

(vii) the stated capital of Amalco will be the sum of the stated capital of the Company and NewCo Sub;

(viii) Amalco will own and hold all property of the Company and NewCo Sub, and, without limiting the provisions hereof, all rights of creditors or others will be unimpaired by such Amalgamation, and all obligations of the Company and NewCo Sub, whether arising by contract or otherwise, may be enforced against Amalco to the same extent as if such obligations had been incurred or contracted by it;

(ix) Amalco will continue to be liable for the obligations of the Company and NewCo Sub;

(x) all rights, contracts, permits and interests of the Company and NewCo Sub will continue as rights, contracts, permits and interests of Amalco and, for greater certainty, the Amalgamation will not constitute a transfer or assignment of the rights or obligations of the Company and NewCo Sub under any such rights, contracts, permits and interests;

(xi) any existing cause of action, claim or liability to prosecution will be unaffected;

(xii) a civil, criminal or administrative action or proceeding pending by or against the Company or NewCo Sub may be continued by or against Amalco; and

(xiii) a conviction against, or ruling, order or judgment in favour of or against, the Company or NewCo Sub may be enforced by or against Amalco.

The transactions provided for in this Section 3.1 will be deemed to occur on the Effective Date notwithstanding that certain of the procedures related hereto are not completed until after the Effective Date (and provided that none of the foregoing will occur or will be deemed to occur unless all of the foregoing occur and, if they occur, all of the foregoing will be deemed to occur without further act or formality).

3.2 Each Company Shareholder who is an Eligible Holder shall be entitled to make an income tax election pursuant to subsection 85(1) of the Tax Act, or subsection 85(2) of the Tax Act if such Company Shareholder is a partnership (and in each case, where applicable, the analogous provisions of provincial

income tax law), with respect to the transfer of its Company Common Shares to SOAC and the receipt of the Exchange Consideration in respect thereof by: (A) notifying SOAC of its intention to make such an income tax election by completing the Letter of Transmittal accordingly; and (B) providing two signed copies of the necessary prescribed election form(s) (or equivalent information through an alternative document or platform, at SOAC's discretion) to SOAC within 90 days following the Agreement Effective Date in accordance with the instructions provided on SOAC's website, duly completed with the details of the number of Company Common Shares transferred and the applicable agreed amounts for the purposes of such elections. Thereafter, subject to the election forms being correct and complete and complying with the provisions of the Tax Act (and applicable provincial income tax law), the forms will be signed by SOAC and returned to such former Company Shareholder within 90 days after the receipt of the election forms (and/or equivalent information through and alternative document or platform) by SOAC (and/or its representative) for filing with the Canada Revenue Agency (or the applicable provincial taxing authority) by such former Company Shareholder. SOAC will not be responsible for the proper completion of any election form and, except for SOAC's obligation to return (within 90 days after the receipt thereof) duly completed election forms which election forms (and/or equivalent information through and alternative document or platform) are received by SOAC within 90 days of the Arrangement Effective Date, SOAC will not be responsible for any taxes, interest or penalties resulting from the failure by a former Company Shareholder to properly complete or file the election forms in the form and manner and within the time prescribed by the Tax Act (or any applicable provincial legislation).

ARTICLE 4
RIGHTS OF DISSENT

4.1 In connection with the Arrangement, each registered Company Shareholder (other than a Supporting Company Shareholder) may exercise rights of dissent (the "**Arrangement Dissent Rights**") with respect to the Company Shares held by such Company Shareholder pursuant to Section 237 to 247 of the BCBCA, as modified by the Interim Order and this Section 4.1; provided that, notwithstanding Section 242(1)(a) of the BCBCA, the written objection to the Company Arrangement Resolution referred to in such section of the BCBCA must be received by the Company not later than 4:00 p.m. (Vancouver time) on the day that is two Business Days preceding the Company Shareholders Meeting.

4.2 Dissenting Shareholders who duly exercise their Arrangement Dissent Rights and are ultimately entitled to be paid by the Company the fair value for their Company Common Shares (1) shall be deemed to not to have participated in the transactions in Article 3 (other than Section 3.1(b)); (2) shall be deemed to have transferred and assigned such Company Common Shares held by them in respect of which Arrangement Dissent Rights have been validly exercised to the Company, free and clear of all Liens, in accordance with Section 3.1(b); (3) will be entitled to be paid the fair value of such Company Common Shares by the Company, which fair value, notwithstanding anything to the contrary contained in the BCBCA, shall be determined as of the close of business on the day before the Company Arrangement Resolution was adopted at the Company Shareholders Meeting; and (4) will not be entitled to any other payment or consideration, including any payment that would be payable under the Arrangement had such Dissenting Shareholders not exercised their Arrangement Dissent Rights in respect of such Company Common Shares.

4.3 Dissenting Shareholders who are ultimately not entitled, for any reason, to be paid by the Company the fair value for their Company Common Shares, shall be deemed to have participated in the Arrangement in respect of those Company Common Shares on the same basis as a non-Dissenting Shareholder, and shall be entitled to receive their portion of the Exchange Consideration from SOAC in the same manner as such a non-Dissenting Shareholder, provided such Dissenting Shareholders comply with Article 5 of this Plan of Arrangement.

4.4 In no case shall SOAC, the Company, the Exchange Agent or any other Person be required to recognize a Dissenting Shareholder as a holder of Company Common Shares or any interest therein (other than the rights set out in this Article 4) at or after the Effective Time and the name of each such Dissenting Shareholder shall be removed as the registered holder of such Company Common Shares from the applicable securities register of the Company maintained by or on behalf of the Company as at the Effective Time, as provided in Section 3.1(b)(iv).

4.5 For greater certainty, in addition to any other restrictions in the Interim Order, no Person shall be entitled to exercise Arrangement Dissent Rights with respect to Company Common Shares in respect of which a Person has voted in person or has instructed a proxyholder to vote in favour of the Company Arrangement Resolution at the Company Shareholders Meeting.

4.6 No Arrangement Dissent Rights shall be available to Company Optionholders in connection with the Arrangement.

ARTICLE 5
CERTIFICATES AND PAYMENTS

5.1 As soon as practicable following the SOAC Continuance and prior to the Effective Time, SOAC will deposit or cause to be deposited with the Exchange Agent, for the benefit of and to be held on behalf of the Company Shareholders entitled to receive the Exchange Consideration in accordance with Section 3.1(a)(i), evidence of the Exchange Consideration in the book-entry form. All SOAC Common Shares and Earnout Shares issued as part of the Exchange Consideration issued pursuant hereto shall be deemed to be validly issued and outstanding as fully paid and non-assessable shares for the purposes of the BCBCA.

5.2 Following the deposit with the Exchange Agent of the Exchange Consideration in accordance with Section 5.1, SOAC will be fully and completely discharged from its obligation to pay the Exchange Consideration to the Company Shareholders pursuant to Section 3.1(a), and the rights of such holders will be limited to receiving, from the Exchange Agent, the SOAC Common Shares and the Earnout Shares to which they are entitled in accordance with this Plan of Arrangement. After the Effective Time and until surrendered for cancellation as contemplated by this Article 5, each certificate that immediately prior to the Effective Time represented one or more Company Shares shall be deemed at all times to represent only the right to receive in exchange therefor the Exchange Consideration in book-entry form, that the holder of such certificate is entitled to receive in accordance with Section 3.1(a)(i).

5.3 Until such time as a Company Shareholder deposits with the Exchange Agent a duly completed Letter of Transmittal, and such documents, certificates and instruments contemplated by the Letter of Transmittal, and such other documents and instruments as the Exchange Agent or SOAC reasonably require, the payment or delivery to which such Company Shareholder is entitled will, in each case, be delivered or paid to the Exchange Agent to be held as agent on behalf of and for the benefit of such Company Shareholder for delivery to such Company Shareholder, without interest and net of all applicable withholdings and other taxes, if any, upon delivery of the Letter of Transmittal, and such documents, certificates and instruments contemplated by the Letter of Transmittal, and such other documents, certificates and instruments as the Exchange Agent or SOAC reasonably require.

5.4 Upon surrender to the Exchange Agent for cancellation of a certificate (or affidavit of loss in lieu thereof in the form required by SOAC and the Exchange Agent) that immediately prior to the Effective Time represented one or more Company Common Shares, or in the case of Company Common Shares held in the book-entry form, a properly completed and duly executed Letter of Transmittal, and such additional documents, certificates and instruments as the SOAC, the Company and the Exchange Agent may reasonably require, the holder of such surrendered certificate (or affidavit of loss in lieu thereof), or the deliverer of such Letter of Transmittal, as applicable, will be entitled to receive, and the Exchange Agent will, as promptly as practicable after the Effective Time, deliver to such holder, evidence of the Exchange Consideration, in book entry form, to which such holder is entitled under the Arrangement, and any certificate so surrendered will forthwith be cancelled.

5.5 If any portion of the Exchange Consideration is to be issued to a Person other than the Company Shareholder in whose name the surrendered Certificate or the transferred Company Share in book-entry form is registered, it shall be a condition to the issuance of the applicable portion of the Exchange Consideration that (i) either such Certificate shall be properly endorsed or shall otherwise be in proper form for transfer or such Company Share in book-entry form shall be properly transferred and (ii) the Person requesting such consideration pay to the Exchange Agent any transfer Taxes required as a result

of such consideration being issued to a Person other than the registered holder of such Certificate or Company Share in book-entry form or establish to the satisfaction of the Exchange Agent that such transfer Taxes have been paid or are not payable

5.6 No interest will be paid or accrued on the Exchange Consideration (or any portion thereof). From and after the Effective Time, until surrendered or transferred, as applicable, in accordance with this Article 5, each Company Share shall solely represent the right to receive a portion of the Exchange Consideration to which such Company Share is entitled to receive in accordance with the Allocation Schedule.

5.7 Any portion of the aggregate Exchange Consideration that remains unclaimed by the Company Shareholders six (6) years following the Effective Time shall be delivered to SOAC or as otherwise instructed by SOAC, and any right or claim to payment under the Plan of Arrangement that remains outstanding six (6) years following the Arrangement Effective Date shall cease to represent a right or claim of any kind or nature and the right of the Company Shareholders to receive the applicable portion of the aggregate Exchange Consideration in accordance with the Plan of Arrangement shall terminate and be deemed to be surrendered and forfeited to SOAC, for no consideration.

5.8 In no event will any Person be entitled to a fractional SOAC Common Share or fractional Earnout Share. Where the aggregate number of SOAC Common Shares or Earnout Shares to be issued to a Person pursuant to the Plan of Arrangement would result in a fraction of a SOAC Common Share or Earnout Share being issuable, the number of SOAC Common Shares and Earnout Shares to be received by such Person will be rounded up to the nearest whole SOAC Common Share or Earnout Share, as the case may be.

5.9 No dividend or other distribution declared or made after the Effective Time with respect to the Exchange Consideration with a record date after the Effective Time shall be delivered to the holder of any unsurrendered certificate that, immediately prior to the Effective Time, represented outstanding Company Shares unless and until the holder of such certificate shall have complied with the provisions of Article 5. Subject to applicable law and to Section 6.1, at the time of such compliance, there shall, in addition to the delivery of evidence of the portion of the Exchange Consideration to which such holder is entitled under the Arrangement, be delivered to such holder, without interest, the amount of the dividend or other distribution with a record date after the Effective Time theretofore paid with respect to such Exchange Consideration.

ARTICLE 6
EFFECT OF THE ARRANGEMENT; WITHHOLDINGS

6.1 From and after the Effective Time: (a) this Plan of Arrangement will take precedence and priority over any and all Affected Securities issued prior to the Effective Time, (b) the rights and obligations of the Affected Securityholders, the Company, SOAC, NewCo Sub, Amalco, the Exchange Agent and any transfer agent or other exchange agent therefor in relation thereto, will be solely as provided for in this Plan of Arrangement, and (c) all actions, causes of action, claims or proceedings (actual or contingent and whether or not previously asserted) based on or in any way relating to any Affected Securities will be deemed to have been settled, compromised, released and determined without liability except as set forth in this Plan of Arrangement.

6.2 SOAC, the Company and the Exchange Agent shall be entitled to deduct and withhold (or cause to be deducted and withheld) with respect to any consideration payable pursuant to this Plan of Arrangement such amounts as are required to be deducted and withheld under applicable Tax Law. Any amounts so withheld shall be timely remitted to the applicable Governmental Entity, and shall be treated for all purposes of this Plan of Arrangement as having been paid to the Person in respect of which such deduction and withholding was made. Each of SOAC and the Exchange Agent, as applicable, is hereby authorized to sell or otherwise dispose of, on behalf of such Person, such portion of the Exchange Consideration as is necessary to provide sufficient funds to SOAC or the Exchange Agent, as the case may be, to enable it to comply with such deduction and withholding requirement and SOAC or the Exchange Agent shall use commercially reasonable efforts to notify such Person thereof and remit the applicable portion of the net proceeds of such sale to the appropriate Governmental Entity and, if applicable, any portion of such net proceeds that is not required to be so remitted shall be paid to

such Person. The Parties shall cooperate in good faith to eliminate or reduce any such deduction or withholding (including through the request and provision of any statements, forms or other documents to reduce or eliminate any such deduction or withholding).

ARTICLE 7
AMENDMENTS

7.1 The Company and SOAC may amend, modify and/or supplement this Plan of Arrangement at any time and from time to time prior to the Effective Time, provided that each such amendment, modification and/or supplement must (i) be set out in writing, (ii) be approved by the Company and SOAC, each acting reasonably, (iii) be filed with the Court and, if made following the Company Shareholders Meeting, approved by the Court, and (iv) be communicated to the Affected Securityholders if and as required by the Court.

7.2 Any amendment, modification or supplement to this Plan of Arrangement may be proposed by the Company or SOAC at any time prior to the Company Shareholders Meeting (provided that the Company or SOAC will have consented thereto) with or without any other prior notice or communication, and if so proposed and accepted by the Persons voting at the Company Shareholders Meeting(other than as may be required under the Interim Order), will become part of this Plan of Arrangement for all purposes.

7.3 Any amendment, modification or supplement to this Plan of Arrangement that is approved or directed by the Court following the Company Shareholders Meeting will be effective only if (i) it is consented to in writing by each of the Company and SOAC (in each case, acting reasonably) and (ii) if required by the Court, it is consented to by some or all of the Company Shareholders voting in the manner directed by the Court.

7.4 Any amendment, modification or supplement to this Plan of Arrangement may be made following the Effective Date by SOAC, provided that it concerns a matter which, in the reasonable opinion of SOAC, is of an administrative nature required to better give effect to the implementation of this Plan of Arrangement.

ARTICLE 8
FURTHER ASSURANCES

8.1 Notwithstanding that the transactions and events set out herein will occur and be deemed to occur in the order set out in this Plan of Arrangement without any further act or formality, each of the parties to the Business Combination Agreement will make, do and execute, or cause to be made, done and executed, all such further acts, deeds, agreements, transfers, assurances, instruments or documents as may reasonably be required by any of them in order further to document or evidence any of the transactions or events set out therein.

ARTICLE 9
U.S. SECURITIES LAW MATTERS

9.1 Notwithstanding any provision herein to the contrary, this Plan of Arrangement will be carried out with the intention that (i) all Exchange Consideration to be issued to Affected Securityholders in exchange for their Affected Securities pursuant to this Plan of Arrangement, as applicable, will be issued and exchanged in reliance on the exemption from the registration requirements of the U.S. Securities Act as provided by section 3(a)(10) thereof and applicable state securities laws, and pursuant to the terms, conditions and procedures set forth in the Business Combination Agreement; and (ii) all Rollover Options to be issued to Company Optionholders in exchange for their Company Options pursuant to this Plan of Arrangement will be issued and exchanged in reliance upon the exemption from the registration requirements of the U.S. Securities Act as provided by section 3(a)(10) thereof.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 20. Indemnification of directors and officers

Cayman Islands law does not limit the extent to which a company's memorandum and articles of association may provide for indemnification of officers and directors, except to the extent any such provision may be held by the Cayman Islands courts to be contrary to public policy, such as to provide indemnification against willful default, willful neglect, civil fraud or the consequences of committing a crime. The Existing Governing Documents provided for indemnification of our officers and directors to the maximum extent permitted by law, including for any liability incurred in their capacities as such, except through their own actual fraud, willful default or willful neglect.

We have entered into agreements with our officers and directors to provide contractual indemnification in addition to the indemnification provided for in the Existing Governing Documents. We have purchased a policy of directors' and officers' liability insurance that insures our officers and directors against the cost of defense, settlement or payment of a judgment in some circumstances and insures us against our obligations to indemnify our officers and directors.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling us pursuant to the foregoing provisions, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

Item 21. Exhibits and Financial Statements Schedules

(a) Exhibits.

Exhibit Number	Description
2.1††	Business Combination Agreement, dated as of March 4, 2021, by and among Sustainable Opportunities Acquisition Corp., 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada, and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada (included as Annex A to the proxy statement/prospectus).
3.1	Amended and Restated Memorandum and Articles of Association of SOAC (included as Annex I to the proxy statement/prospectus).
3.2	Form of Notice of Articles of TMC the metals company Inc., to become effective upon Continuance (included as Annex B to the proxy statement/prospectus).
3.3	Form of Articles of TMC the metals company Inc., to become effective upon Continuance (included as Annex C to the proxy statement/prospectus).
4.1*	Specimen Unit Certificate (incorporated by reference to Exhibit 4.1 to the Registration Statement on Form S-1/A filed by the Registrant on May 1, 2020).
4.2*	Specimen Ordinary Share Certificate (incorporated by reference to Exhibit 4.2 to the Registration Statement on Form S-1/A filed by the Registrant on May 1, 2020).
4.3*	Specimen Warrant Certificate (incorporated by reference to Exhibit 4.3 to the Registration Statement on Form S-1/A filed by the Registrant on May 1, 2020).
4.4*	Warrant Agreement between Continental Stock Transfer & Trust Company and Sustainable Opportunities Acquisition Corp., dated May 8, 2020 (incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K filed by the Registrant on May 8, 2020).
4.5*	Warrant to Purchase Common Shares issued by DeepGreen Metals Inc. to Allseas Group S.A. on March 4, 2021.
5.1**	Opinion of Kirkland & Ellis LLP.
5.2**	Opinion of Stikeman Elliott LLP, Canadian Counsel to the Registrant.
10.1	Form of PIPE Subscription Agreement for institutional investors (included as Annex E-1 to the proxy statement/prospectus).
10.2	Form of PIPE Subscription Agreement for accredited investors (included as Annex E-2 to the proxy statement/prospectus).
10.3	Form of Transaction Support Agreement (included as Annex F to the proxy statement/prospectus).
10.4††	Sponsor Letter Agreement, dated as of March 4, 2021, by and among Sustainable Opportunities Holdings LLC, certain other holders set forth on Schedule I thereto, Sustainable Opportunities Acquisition Corp. and DeepGreen Metals Inc. (and included as Annex G to the proxy statement/prospectus).

Exhibit Number	Description
10.5	Form of Amended and Restated Registration Rights Agreement (included as Annex H to the proxy statement/prospectus).
10.6	Form of TMC Incentive Equity Plan (included as Annex D to the proxy statement/prospectus).
10.7†*	Strategic Alliance Agreement, dated as of March 29, 2019, by and between DeepGreen Metals Inc. and Allseas Group S.A.
10.8†*	Pilot Mining Test Agreement dated as of July 8, 2019, by and between DeepGreen Metals Inc. and Allseas Group S.A.
10.9†*	Third Amendment to Pilot Mining Test Agreement and First Amendment to Strategic Alliance Agreement, dated as of March 4, 2021, by and between DeepGreen Metals Inc. and Allseas Group S.A.
10.10*	Investment and Participation Agreement, dated as of March 15, 2017, by and among DeepGreen Metals Inc., Maersk Supply Service NS, and Maersk Supply Service Subsea UK Limited.
10.11*	Project Management Framework Agreement, dated as of April 6, 2018, by and among Nauru Ocean Resources Inc. and Maersk Supply Service Integrated Solutions A/S.
10.12*	Letter Agreement, dated as of March 3, 2021, by and among DeepGreen Metals Inc., Maersk Supply Service NS, and Maersk Supply Service Subsea UK Limited.
10.13†*	Sponsorship Agreement, dated as of March 8, 2008, by and between the Kingdom of Tonga and Tonga Offshore Mining Limited.
10.14†*	Sponsorship Agreement, dated as of June 5, 2017, by and among the Republic of Nauru, the Nauru Seabed Minerals Authority, and Nauru Ocean Resources Inc.
10.15*	ISA Contract for Exploration (Republic of Nauru) dated as of July 22, 2011.
10.16*	ISA Contract for Exploration (Kingdom of Tonga) dated as of January 11, 2012.
10.17+	Employment Agreement, dated January 1, 2018, by and between DeepGreen Metals Inc. and Gerard Barron.
10.18+	Employment Agreement, dated July 25, 2017, by and between DeepGreen Metals Inc. and Anthony O'Sullivan.
10.19+	Employment Agreement, dated September 1, 2018, by and between DeepGreen Metals Inc. and Erika Ilves.
10.20+	DeepGreen Metals Inc. Stock Option Plan and form of Stock Option Agreement thereunder.
10.21+	Amendment to DeepGreen Metals Inc. Stock Option Plan.
10.22+	TMC the metals company Inc. 2021 Incentive Equity Plan (included as Annex D).
23.1	Consent of Ernst & Young LLP, independent registered accounting firm for DeepGreen.
23.2	Consent of Marcum, LLP, independent registered accounting firm for SOAC.
23.3**	Consent of Kirkland & Ellis LLP (included as part of Exhibit 5.1).
23.4**	Consent of Stikeman Elliott LLP (included as part of Exhibit 5.2).
23.6	Consent of AMC Consultants Pty Ltd.
23.7	Consent of AMC Consultants Pty Ltd.
23.8*	Consent of Canadian Engineering Associates Ltd.
23.9*	Consent of Deep Reach Technology Inc.
23.10*	Consent of Margin — Marine Geoscience Innovation.
23.11*	Consent of John Michael Parianos.
24.1*	Power of Attorney (included on signature page to the initial filing of the Registration Statement).
96.1	Technical Report Summary — Initial Assessment of the NORI Property, Clarion-Clipperton Zone, for Deep Green Metals Inc., effective as of March 17, 2021, by AMC Consultants Pty Ltd and other qualified persons.
96.2	Technical Report Summary — Initial Assessment of the TOML Mineral Resource, Clarion-Clipperton Zone, Pacific Ocean, for Deep Green Metals Inc., effective as of March 26, 2021, by AMC Consultants Pty Ltd and other qualified persons.
99.1	Form of Proxy Card.
99.2	Consent of Andrew Hall.
99.3	Consent of Eric Branderiz.
99.4	Consent of Sheila Khama.
99.5	Consent of Riva Krut.

Exhibit Number	Description
99.6	Consent of Andrei Karkar
99.7	Consent of Christian Madsbjerg
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase

* Previously filed.
** To be filed by amendment.
+ Indicates a management contract or compensatory plan.
† Certain confidential portions (indicated by brackets and asterisks) have been omitted from this exhibit.
†† Schedules and exhibits to this Exhibit omitted pursuant to Regulation S-K Item 601(b)(2). The Registrant agrees to furnish supplementally a copy of any omitted schedule or exhibit to the SEC upon request.

Item 22. Undertakings

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof), which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "*Calculation of Registration Fee*" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchasers:

(ii) Each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated

by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) the portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(c) The undersigned registrant hereby undertakes as follows:

(1) That prior to any public reoffering of the securities registered hereunder through use of a prospectus which is a part of this registration statement, by any person or party who is deemed to be an underwriter within the meaning of Rule 145(c), the issuer undertakes that such reoffering prospectus will contain the information called for by the applicable registration form with respect to reofferings by persons who may be deemed underwriters, in addition to the information called for by the other items of this form.

(2) That every prospectus (i) that is filed pursuant to paragraph (1) immediately preceding or (ii) that purports to meet the requirements of Section 10(a)(3) of the Securities Act and is used in connection with an offering of securities subject to Rule 415, will be filed as a part of an amendment to the registration statement and will not be used until such amendment is effective, and that, for purposes of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(d) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification

against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(e) The undersigned registrant hereby undertakes to respond to requests for information that is incorporated by reference into the prospectus pursuant to Items 4, 10(b), 11, or 13 of Form S-4, within one business day of receipt of such request, and to send the incorporated documents by first class mail or other equally prompt means. This includes information contained in documents filed subsequent to the effective date of the registration statement through the date of responding to the request.

(f) The undersigned registrant hereby undertakes to supply by means of a post-effective amendment all information concerning a transaction, and the company being acquired involved therein, that was not the subject of and included in the registration statement when it became effective.

SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of New York, State of New York on the 26th of May, 2021.

SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.

By: /s/ Scott Leonard
Name: Scott Leonard
Title: Chief Executive Officer and Director

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed below by the following persons in the capacities and on the dates indicated.

Name	Position	Date
/s/ * Scott Honour	Chairman of the Board	May 26, 2021
/s/ Scott Leonard Scott Leonard	Chief Executive Officer and Director *(Principal Executive Officer)*	May 26, 2021
/s/ * David Quiram	Chief Financial Officer *(Principal Financial Officer and Principal Accounting Officer)*	May 26, 2021
/s/ * Rick Gaenzle	Director	May 26, 2021
/s/ * Isaac Barchas	Director	May 26, 2021
/s/ * Justin Kelly	Director	May 26, 2021

*By: /s/ Scott Leonard
Scott Leonard
Attorney-in-Fact

Exhibit 10.17

EMPLOYMENT AGREEMENT

This Agreement is made and effective as of December 15th, 2017 (the "Effective Date")

Between:

DEEPGREEN METALS INC., a company incorporated pursuant to the laws of British Columbia, Canada (the "Company"),

- and -

GERARD BARRON (the "Employee")

WHEREAS the Company desires to hire the Employee;

AND WHEREAS the Employee agrees to accept employment with the Company on the terms and conditions set out in this agreement;

NOW THIS AGREEMENT WITNESSES that in consideration of the premises and mutual covenants herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by both parties, the parties hereby covenant and agree with each other as follows:

1. TERM

1.1 This agreement will start on the Effective Date and continue for an indefinite term unless terminated by either party in accordance with the terms of this agreement.

2. POSITION AND DUTIES

2.1 The Employee will be employed as Chief Executive Officer, and report to the Board of Directors of the Company (the "Board"). The Employee will perform such duties and assume such responsibilities inherent in and consistent with this position, including any reasonable additional duties and responsibilities as the Board may require and assign to him from time to time.

2.2 The Employee agrees to act as a director or officer of the Company or any of its affiliates (as defined in the British Columbia *Business Corporations Act*) if so requested by the Board and agrees that his Base Salary (as defined below) is adequate consideration for him so acting.

2.3 The Employee will be based out of such location as mutually agreed between the parties from time to time. At the time of this agreement the base of the employee is Dubai. Notwithstanding the Employee's location, the Employee acknowledges that the nature of his employment requires international travel to places other than his regular place of employment. All travel and related expenses must be incurred in accordance with the Company's travel expense policy.

3. CONFLICT OF INTEREST/DUTY OF LOYALTY

3.1 The Employee agrees to act, at all times, in the best interests of the Company. The Employee will not, without the advanced written approval of the Company, directly or indirectly engage in or have an interest in any other enterprise, occupation or profession, or become a principal, agent, director, officer, or employee of another entity which interferes or conflicts with the Employee's duties and responsibilities to the Company or the interests of the Company.

4. BASE COMPENSATION

4.1 Commencing January 1st, 2018 the Company will pay to the Employee an annual salary of US $450,000, paid in accordance with the Company's usual payroll practices (the "Base Salary"). The Base Salary covers all time worked.

4.2 The Employee is responsible for paying all applicable taxes on all remuneration received by him from the Company, including without limitation the Base Salary. The Employee further acknowledges and agrees that the Company is not responsible in any way for:

(i) payment of any income or withholding taxes, levies, superannuation, pension, or workers compensation contributions;

(ii) the deduction, withholding or remittance of any income tax;

in relation to or arising out of the payment of remuneration to him from the Company.

The Employee further agrees to indemnify and keep indemnified the Company against any of the costs referred to in clause 4.2(i) and (ii) that the Company is required to pay in relation to or arising out of the payment of remuneration to him from the Company.

4.3 The Company will review the Employee's Base Salary on an annual basis. The Company is not obligated to increase the Employee's Base Salary at any review.

4.4 Upon Execution of this Agreement the Company will also issue to the Employee 250,000 common shares in lieu of cash for the period worked from July to November 2017 (inclusive).

4.5 The Employee represents to the Company that he is based in Dubai for purposes of taxation and that the Company is not required to withhold any taxes or make any payment of taxes to any taxation authority in regards to the remuneration being received by him from the Company.

5. SHORT-TERM INCENTIVE PLAN

5.1 At the discretion of the Board from year to year, the Employee may be eligible to be considered for an annual performance incentive bonus (Bonus) under the Company's Short-Term Incentive Plan (STIP). If the Board decides that the Employee will have a right to be eligible to earn a Bonus in a particular year, the terms of the Bonus will be detailed in a separate agreement ("Bonus Agreement"), setting out the performance targets and Bonus payable upon achievement of the performance targets. A Bonus will only be payable if the Employee achieves the performance targets as set out in the Bonus Agreement. Where payable, the Bonus payment shall be made as soon as practicable following the first quarter of the first financial year following that in which it is earned (and for greater certainty, not when the performance goal is achieved).

5.2 Where payable, the Bonus payment may be paid by the Company through either cash or shares (or a combination of both) at the Board's discretion. If the Board chooses to pay the Bonus or part thereof through the issuance of shares, then the price at which the shares shall be issued will be the last price at which capital was raised in the Company, or in the event that the shares of the Company are listed on a stock exchange, then the Value Weighted Average Price of the shares for the 10 trading days before the issue.

5.3 As a one off incentive, and in addition to any other incentives covered by this Agreement, it is acknowledged that the Company's future will be greatly impacted by whether Maersk exercise their option and purchase US$50 million of shares in the Company by the end of 2018. In the event that Maersk do exercise their option and pay to the Company US$50 million in cash before the end of 2018, the Employee will be entitled to a one off special bonus of US$750,000 in recognition of his efforts in this regard. This incentive shall be payable within seven business days of the Company receiving the US$50 million as cleared funds from Maersk. It is also agreed that the Employee will pay part of the US$750,000 to other personnel who have played a role in the Maersk partnership, and that the Employee will use his fair discretion to share such bonus with such personel. For clarity, a reference to "Maersk" in this Section 5 3 includes Maersk Supply Service NS, the A.P. Moller—Maersk Group, as well as any entity associated or affiliated with (i) Maersk Supply Service AIS, (ii) the A.P. Moller—Maersk Group, (iii) the Moller family or (iv) the Uggla family.

6. LONG-TERM INCENTIVE PLAN

6.1 The Employee will be eligible to participate in the Company's stock option plan and options may be granted to the Employee thereunder, as and when determined by the Board, in its sole discretion.

6.2 Concurrently with execution of this Agreement, or as soon as practical after the execution of this Agreement, the Employee and the Company shall enter into a stock option agreement, pursuant to which the Employee shall be granted an aggregate of three million stock options, with an exercise price of US $0.75 and subject to the conditions set forth in the Company's stock option plan as amended from time to time, or in the case the Company carries out a Going Public Transaction, then subject to the conditions set forth in the listed entities stock option plan. Of these stock options, 2.5 million will be issued as part of the Employee's Long-Term Incentive Plan and 500,000 as part of his Board remuneration.

6.3 All options granted to the Employee under this section 6 shall be governed by the terms of the Company's stock option plan as amended from time to time and the applicable stock option agreement entered into between the Company and the Employee.

7. BENEFITS AND INSURANCE

7.1 The Employee will be eligible to participate in such group health, dental, and disability benefit plans as the Company may provide to its other executive level employees, subject to the terms of those plans. Such benefits may be varied or removed at any time.

8. EXPENSES

8.1 The Company will reimburse the Employee's reasonable expenses incurred in the course of employment after the Employee provides an itemized expense report in the form required by the Company, and appropriate receipts, and provided each such expense is incurred in accordance with any applicable Company policies.

9. VACATION

9.1 The Employee is entitled to take five (5) weeks of paid vacation per calendar year, pro rated for part years. Vacation may only be taken at a time approved by the Board having regard to business needs of the Company and must be approved in advance.

10. POLICIES

10.1 The Employee will comply with all Company policies in place from time to time which are brought to the Employee's attention or of which the Employee should reasonably be aware.

11. CONFIDENTIALITY

11.1 In the course of employment, the Employee will have access to, be entrusted with, and acquire detailed and confidential knowledge of the Company's confidential and proprietary business information and operations ("Confidential Information"). Confidential Information includes but is not limited to:

(a) work product resulting from or relating to work or projects performed or to be performed by the Employee or any employee or consultant of the Company, including interim and final lines of inquiry, hypotheses, research, conclusions, surveys, methods, processes, procedures, analyses, techniques, and audits used in connection with any projects, explorations, or research conducted by the Company;

(b) information concerning mineral properties, mineral exploration data, mineral exploration information, mining and exploration proposals;

(c) intellectual property, including any art, process, machine, manufacture or composition of matter or any improvement therein, patents, trademarks, trade secrets, processes, methods, industrial designs, works subject to copyright including architectural works, developments, and trade names; and any applications for registration of any of the foregoing, and any litigation or negotiations;

(d) corporate information, including contractual licensing arrangements, plans, strategies, tactics, policies, resolutions, debt arrangements, equity structure, investors and prospective investors (including all discussions, correspondence, plans and relationship history therewith) and holdings, recruitment, distribution plans, expansion plans, and business opportunities;

(e) financial information, including margins, cost and pricing information, sales, investment, and product plans, and expenses;

(f) personnel information, including personnel lists, resumes, personnel data, employee compensation, organizational structure and performance evaluations;

(g) marketing information, including materials, strategies, techniques, market research data, performance data, and prospects;

(h) operational and scientific information, including software;

(i) technical information, including technical drawings, designs, prototypes, and know-how; and

(j) all other material or information which has or will come into the possession or knowledge of the Employee in connection with his employment.

11.2 "Confidential Information" does not include information already in the public domain other than through a breach of this agreement or a breach of any other obligations of confidentiality under contract or the common law.

11.3 The Employee acknowledges and agrees that his use or disclosure of any Confidential Information to anyone, but particularly to the public or competitors of the Company would be highly detrimental to the Company's interests. The Employee hereby acknowledges and agrees that all Confidential Information is the sole and exclusive property of the Company, whether arising before or after the start of this agreement, and that the right of the Company to maintain such Confidential Information as confidential constitutes a proprietary right which the Company is entitled to protect.

11.4 The Employee covenants and agrees to:

(a) take precautions to keep all Confidential Information, and any information which in good faith and good conscience ought to be treated as confidential, in the strictest confidence;

(b) use commercially reasonable efforts to prevent any other individual or entity from making unauthorized use of the Confidential Information;

(c) not copy, forward by email, download, retain, communicate, use, publish, upload to the Internet, or disclose any Confidential Information to any individual or entity, directly or indirectly, or in any manner whatsoever, during or after this agreement, except as reasonably necessary to carry out employment duties, or as otherwise authorized in writing by the Company;

(d) not, directly or indirectly, use any Confidential Information for his own benefit or the benefit of any other individual or entity at any time before, during, or after this agreement; and

(e) forthwith return to the Company all Confidential Information, and all copies thereof, in the Employee's possession or control upon request at any time, and upon the termination of this agreement.

12. RESTRICTIVE COVENANTS

12.1 The Employee acknowledges that the Company is engaged in a highly competitive industry and, in order to protect its legitimate business interests, the following restrictions on competition in the markets in which the Company is engaged are necessary and reasonable.

12.2 The Employee acknowledges that the Employee owes to the Company a fiduciary duty.

12.3 The Employee covenants and agrees to comply with the terms set out in Section 11 of this Agreement.

12.4 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, individually or in partnership or in conjunction with any person(s) or entity, encourage or solicit any employee of the Company to leave the Company for any reason or to accept employment with any other entity.

12.5 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, individually or in partnership or in conjunction with any person(s) or entity, solicit, divert or take away, or attempt to divert or take away the business or patronage of any investor, customer or supplier, or prospective investor, customer or supplier, of the Company which, in the twelve (12) month period prior to the termination of this agreement, were contacted, solicited or served by the Employee or with respect to which the Employee acquired Confidential Information.

12.6 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, whether directly or indirectly, individually or in partnership or in conjunction with any person(s) or entity, engage in any endeavour, employment, activity, consulting, or business, in whole or in part, involving the exploration, assessment, harvesting, transporting, processing, exploitation or distribution of seafloor polymetallic nodules and/or products derived therefrom.

12.7 The Employee covenants and agrees not to usurp for his own benefit or to disclose to any other person(s) or entity, directly or indirectly, any corporate opportunities that the Employee became or becomes aware of by virtue of his employment, whether or not the Company decides to pursue such opportunities.

12.8 The Employee acknowledges and agrees that:

(a) his employment with the Company will allow him unique and substantial access to Confidential Information;

(b) in the event the Employee breaches sections 11 or 12 of this agreement, the Company will be exposed to significant and potentially irreparable damage to its business;

(c) the undertakings in sections 11 and 12 are reasonable in scope and duration and necessary for the protection of the confidential information, goodwill and legitimate business interests of the Company and its affiliates;

(d) the undertakings in sections 11 and 12 will not prevent the Employee from earning a living;

(e) the remedy of damages at law for breach of sections 11 or 12 would be inadequate and that temporary and permanent relief by way of injunction against the Employee may be granted in any proceedings which the Company may bring to enforce any of the provisions of sections 11 or 12 without necessity of proof of actual damage suffered by the Company or its affiliates; and

(f) the Employee will, if required by the Company, provide evidence to the reasonable satisfaction of the Company that the Employee is not in breach of sections 11 or 12.

13. INVENTION ASSIGNMENT

13.1 “Invention” means any item, machine, product, idea, project, process, art, or service created by the Employee and includes, without limitation, intellectual property, works subject to economic copyright, trade-marks, trade names, patents, patent applications, discoveries, ideas, plans, methodologies, designs, research data, trade secrets, materials, equipment, tools, marketing and sales materials, and other materials in any way relating to any Confidential Information of the Company.

13.2 The Employee acknowledges and agrees that any Invention the Employee conceives or makes during employment in connection with the company’s business of subsea nodule harvesting, processing and marketing, whether or not during regular working hours and whether or not using resources and/or tools belonging to the Company, shall be for the benefit of the Company and shall immediately become the exclusive property of the Company.

13.3 The Employee agrees to assign and transfer, exclusively to the Company, any and all of the Employee's right, title, and interest in and to any Invention subject to clause 13.2 together with the goodwill related to all trade-marks, together with all inventions, patents, applications, reissues, continuations, continuations in part, or divisional applications for any patent, and any other intellectual property in any Invention, in Canada and throughout the world, that the Employee has solely or jointly authored, created, conceived, developed, or reduced to practice. The Employee agrees not to apply for protection of any intellectual property rights for any Invention and agrees not to oppose, contest, or seek to invalidate any registration of such rights by the Company.

13.4 Upon the request of the Company at any time, the Employee agrees to sign all necessary documents and do all acts necessary to assign and transfer all Inventions and all rights thereto, under the laws of copyright, patent, trade-mark, industrial design, or otherwise, to the Company, so that the Company can make application through its attorneys for letters patent, copyright, industrial design, or trade-mark registration in Canada, and any and all countries foreign thereto.

13.5 The Employee waives all moral rights, or similar rights, which the Employee may have in any Invention, and to any intellectual property owned by the Company, in Canada and throughout the world.

13.6 The Employee represents and warrants to the Company that any Inventions will be original and will not knowingly violate or infringe upon the rights of any third party under the laws of copyright, trade-mark, privacy, publicity, defamation or otherwise. The Employee agrees to indemnify and hold the Company harmless from and against all loss, cost and damage (including legal fees) incurred or suffered by reason of any violation or infringement upon such rights of any third party.

13.7 The Employee covenants and agrees that during employment, the Employee will not knowingly use or incorporate into any Invention any confidential information or trade secrets of any former company, any person or entity to whom the Employee provided services, or any other person or entity, unless the Employee has obtained all consents, licenses, or other rights necessary to allow the Employee to provide the Company with the assignments and licenses set forth herein.

14. TERMINATION

14.1 The Company may terminate this agreement without penalty for (i) just cause or (ii) if the Employee breaches this Agreement, and:

(a) a notice has been delivered by the Company to the Employee setting out in detail the nature of the just cause and/or breach; and

(b) the Employee fails to remedy the just cause and/or breach within 30 days of receiving said notice.

14.2 The Company may terminate this Agreement immediately without penalty if the Employee:

(a) is convicted of a criminal offence or any other indictable offence (other than traffic violations and minor misdemeanour);

(b) is declared bankrupt;

(c) commits theft, fraud or embezzlement from the Company or any of its subsidiaries or any other material act of dishonesty by Employee; or

(d) commits any act, omission or negligence which results in either material loss or damage to the Company or any of its subsidiaries or prejudice to any of their business standings or reputations;

14.3 The Company may terminate this agreement at any time without cause by providing the Employee with:

(a) (i) three (3) months of Base Salary or, (ii) in the case that the Company has raised US $20 million of fresh equity from the 1 January 2018 to the date of termination and the Company has greater than US $10 million of cash at bank at the time, then twelve (12) months of Base Salary paid as a salary continuance in accordance with the Company's standard monthly payroll practices, always provided that in the case of i) or ii) the Company has greater than US $10 million of cash at bank at the time of such termination otherwise no salary continuance shall be payable;

(b) all accrued Base Salary, any declared but unpaid Bonus and vacation to the date of termination;

(c) continuation of benefit coverage for the period of time that may be required by applicable employment standards legislation;

14.4 If at any time after there is a Change of Control, and

(a) the Company terminates the Employee's employment without cause; or

(b) a Triggering Event occurs and the Employee delivers notice of his resignation within thirty (30) days of the Triggering Event,

the Employee shall be entitled to receive the applicable amount set out in accordance with Section 14.3.

14.5 If the Employee does not deliver the notice of resignation as a result of a Triggering Event within thirty (30) days of such Triggering Event, the Employee shall be deemed to have accepted the Triggering Event.

14.6 The Employee acknowledges and agrees that the payments and benefits provided to him by the Company in Section 14.3 are inclusive of his entitlements under applicable employment standards legislation and the common law, and he shall have no further claim in respect of notice of termination, severance, or separation pay of any kind.

14.7 The Employee shall execute a release in a commercially reasonable form, drafted by and acceptable to the Company, in order to receive any amounts in Section 14.3 that exceed his entitlements under applicable employment standards legislation.

14.8 In the event the Employee is in breach of any of the restrictive covenants or confidentiality set out in this Agreement, the Company reserves the right to cease payment of the salary continuance and in such case shall only be obligated to pay any minimum statutory requirements under any applicable employment standards legislation until such breach is cured to the Company's satisfaction in its sole discretion.

14.9 The Employee may resign his employment by providing at least ninety (90) days' written notice. The Company may waive all or part of the notice period in which case no further payment (including without limitation Base Salary and/or Bonus) will be due past the last day of employment as specified by the Company or as required by law.

14.10 In the event any of the termination provisions above conflict with applicable employment standards legislation, the requirements of the applicable employment standards legislation will prevail.

14.11 These termination provisions will continue to apply throughout the Employee's employment notwithstanding any changes to the Employee's compensation, title, duties, reporting line, or responsibilities.

14.12 Upon termination, and prior to any further payments that may be payable under this Agreement, the Employee will immediately return all Company property (including without limitation credit cards, access codes, passwords, keys, computers and phones) and any Confidential Information in his possession or control. The employee will also execute such documents that the Company may reasonably request to amongst other things, cancel credit cards, change bank signatures and banking authorities and letters of resignation to the Board of the Company and its affiliates as appropriate and provide the Company with details of all passwords that allow access by the Company to all emails, all online services and online subscriptions or accounts, including cloud storage.

15. APPLICABLE DEFINITIONS

15.1 "Triggering Event" means any one of the following events which occurs without the Employee's written agreement:

(a) a material adverse change to any of the Employee's duties, powers or title, as they existed immediately prior to a Change of Control;

(b) a material adverse change in the office or body to whom the Employee reports immediately prior to a Change of Control, except if such office or body is of equivalent rank or stature, provided that this shall not include a change resulting from a promotion in the normal course of business;

(c) a material adverse change in the Employee's Base Salary.

15.2 “Change of Control” means:

(a) a sale, lease or other disposition of all or substantially all of the property or assets of the Company other than to an affiliate which assumes all, or substantially all, of the obligations of the Company; or

(b) a change in the composition of the Company’s Board of Directors which occurs at a single meeting of the shareholders of the Company or upon the execution of a shareholder’s resolution, such that all the individuals who are members of the Board of Directors immediately prior to such meeting or resolution cease to constitute the Board of Directors immediately following such meeting, without the Board of Directors having approved of such change; or

Notwithstanding anything contained in this Agreement, the term “Change of Control’ will not be triggered from:

(a) any change relating to any transaction carried out with the effect of listing the Company’s shares on a stock market;

(b) any change relating to a transaction involving an amalgamation or takeover where the Employee is offered the role of Chief Executive Officer of the amalgamated or parent company or similar;

(c) any change relating to a transaction which the Employee has voted in favour of as a Director or shareholder or a Company he is associated with or has recommended to the Board.

16. ASSIGNMENT

16.1 The rights and obligations of the parties under this agreement will enure to the benefit and be binding upon the parties hereto, their respective heirs, executors, administrators, and successors. Only the Company may assign this agreement to affiliates and to any entity which succeeds to all or substantially all of the Company’s business, assets, or property.

17. AMENDMENT AND WAIVER

17.1 No amendment to any term of this agreement is valid unless set forth in writing and duly executed by the parties. The waiver by the.. Company or the Employee of a breach of any provision of this agreement will not operate or be construed as a waiver of any subsequent breach by the Company or the Employee.

18. SEVERABILITY

18.1 The invalidity or unenforceability of any provision of this agreement will not affect the validity or enforceability of any other provision. Any invalid provision will be severable from this agreement.

19. RECOURSE ON BREACH

19.1 The Company and Employee acknowledges that damages would be an insufficient remedy for a breach of this agreement and understands that the Company or Employee may apply to a court for injunctive relief to restrain any breach, or threatened breach, of this agreement.

20. GOVERNING LAW

20.1 This agreement is governed by laws of the Province of British Columbia and the federal laws of Canada, as applicable. The parties submit to the jurisdiction of the courts of British Columbia.

21. SURVIVAL

21.1 The termination of all or any part of this agreement will not affect or prejudice any rights or obligations which have accrued or arisen under this agreement or such part thereof prior to the time of termination and those rights and obligations will survive the termination of this agreement or part thereof.

22. CONFIDENTIALITY OF AGREEMENT

22.1 The terms of this agreement are confidential and neither party may disclose its terms without the written consent of the other party with the exception of disclosure to legal or financial advisors, and disclosure required by the law or regulatory bodies, including any applicable stock exchange.

23. ENTIRE AGREEMENT

23.1 This agreement constitutes the entire agreement between the parties with respect to the Employee's employment.

24. INDEPENDENT LEGAL ADVICE

24.1 The Employee acknowledges that it has had independent legal advice or the opportunity to receive same in connection with the execution of this agreement, has read this agreement in its entirety, understands its contents, and is signing this agreement voluntarily and without duress or undue influence from any party.

25. COUNTERPARTS

25.1 This agreement may be executed in counterparts, including by electronic means, each of which will be deemed to be an original and all of which taken together constitute one agreement.

IN WITNESS WHEREOF, the parties hereto have executed this agreement to be effective as of the Effective Date.

DEEPGREEN METALS INC.

/s/ Brian Paes Braga

GERARD BARRON

/s/ Gerard Barron

Exhibit 10.18

EMPLOYMENT AGREEMENT

This Agreement is made and effective as of 25 July 2017 (the "Effective Date")

Between:

DEEPGREEN RESOURCES INC., a company incorporated pursuant to the laws of British Columbia, Canada with a registered office at Suite 1620, 200 Burrard Street, Vancouver, British Columbia, V6C 3L6, CANADA (the "Company"),

- and -

ANTHONY O'SULLIVAN, an individual residing at Unit 708, 2 Bovell Lane, Claremont, Western Australia, 6010, (the "Employee")

WHEREAS the Company desires to hire the Employee;

AND WHEREAS the Employee agrees to accept employment with the Company on the terms and conditions set out in this agreement;

NOW THIS AGREEMENT WITNESSES that in consideration of the premises and mutual covenants herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by both parties, the parties hereby covenant and agree with each other as follows:

1. **TERM**

1.1 This agreement will start on the Effective Date and continue for an indefinite term unless terminated by either party in accordance with the terms of this agreement.

2. **POSITION AND DUTIES**

2.1 The Employee will be employed as Chief Development Officer, and report to the Chief Executive Officer. The Employee will perform such duties and assume such responsibilities inherent in and consistent with this position, including any reasonable additional duties and responsibilities as the Company may require and assign to him from time to time.

2.2 The Employee agrees to act as a director or officer of the Company or any of its affiliates (as defined in the British Columbia *Business Corporations Act*) if so requested by the Company and agrees that his Base Salary (as defined below) is adequate consideration for him so acting.

2.3 The Employee will be based out of Perth, Western Australia, or such other location as mutually agreed between the parties from time to time. Notwithstanding the Employee's location, the Employee acknowledges that the nature of his employment requires international travel to places other than his regular place of employment. All travel and related expenses must be incurred in accordance with the Company's travel expense policy. Subject to DeepGreen's work commitments, some flexible work arrangements can be made, and the Employee will be able to work from home from time to time provided the Employee has prior approval from the Company's Chief Executive Officer.

3. **CONFLICT OF INTEREST/DUTY OF LOYALTY**

3.1 The Employee agrees to act, at all times, in the best interests of the Company. The Employee will not, without the advanced written approval of the Company, directly or indirectly engage in or have an interest in any other enterprise, occupation or profession, or become a principal, agent, director, officer, or employee of another entity which interferes or conflicts with the Employee's duties and responsibilities to the Company or the interests of the Company.

4. **BASE COMPENSATION**

4.1 Commencing June 19, 2017 the Company will pay to the Employee an annual salary of AUD$400,000, less applicable deductions (including Australian PAYG withholding tax or such other withholding tax applicable in the jurisdiction where the Employee resides) and paid in accordance with the Company's usual payroll practices (the "Base Salary"). The Base Salary covers all time worked.

4.2 The Company will review the Employee's Base Salary on an annual basis. The Company is not obligated to increase the Employee's Base Salary at any review.

5. **SHORT-TERM INCENTIVE PLAN**

5.1 The Employee will be eligible to participate in the Company's short-term incentive plan (the "STIP") and to be considered for an annual performance incentive bonus under the STIP. STIP targets and performance goals will be set annually (in advance), by the Company's Chief Executive Officer. Where payable, STIP payments shall be made as soon as practicable following the first quarter of the first financial year following that in which it is earned (and for greater certainty, not when the performance goal is achieved).

5.2 Payments under the STIP shall be satisfied by a combination of the grant of stock options (valued using the Black-Scholes pricing model) and cash. All options granted in satisfaction of STIP payments shall be governed by the Company's stock option plan and any applicable stock option agreement entered into. The ratio of options to cash will not be less than 50% however, by agreement between the CEO and the Employee, the ratio may be adjusted in favour of more options. STIP payments shall be pro-rated for partial years and shall be based on the Employee's then current Base Salary.

5.3 The exercise price for stock options granted pursuant to any STIP payment shall be determined by the Company's Board of Directors with reference to (i) the published market on which the greatest volume of trading in the Company's common shares occurred and the rules of any applicable stock exchange regarding the pricing of stock options; or (ii) if no such published market exists, any and all factors that the Board of Directors considers appropriate in the circumstances at their sole discretion.

5.4 Notwithstanding anything contained in this Section 5, in the event the Company carries out a going public transaction (including without limitation an initial public offering, reverse takeover and/or a transaction with DV Resources Ltd.) ("**Going Public Transaction**"), the Short Term Incentive Plan will be amended by the Company as necessary to facilitate such going public transaction. This may include an amendment to the terms of any stock options granted under the Short Term Incentive Plan so as to comply with the terms of the listed entities' stock option plan.

6. **LONG-TERM INCENTIVE PLAN**

6.1 The Employee will be eligible to participate in the Company's stock option plan and options may be granted to the Employee thereunder, as and when determined by the Board of Directors of the Company, in its sole discretion.

6.2 As soon as practical after the execution of this Agreement, the Employee and the Company shall negotiate in good faith a stock option agreement, pursuant to which the Employee shall be granted stock options (the number of stock options and exercise price will be agreed between the Employee and the Company's Chief Executive Officer). The stock options will be subject to the conditions set forth in the Company's stock option plan, or in the case the Company carries out a Going Public Transaction, subject to the conditions set forth in the listed entities stock option plan.

6.3 All options granted to the Employee under this section 6 shall be governed by the terms of the Company's stock option plan and the applicable stock option agreement entered into between the Company and the Employee, or in the case the Company carries out a Going Public Transaction, then subject to the conditions set forth in the listed entity's stock option plan.

6.4 Subject to Section 6.5, options granted under the Long-Term Incentive Plan shall (i) vest: (a) as to 25% on the first year anniversary of the date of grant (Year 1); (b) as to 25% on the second anniversary of the date of grant (Year 2); (c) as to 25% on the third year anniversary of the date of grant (Year 3); and (d) as to 25% on the fourth year anniversary of the date of grant (Year 4); (ii) have a term of seven years; and (iii) shall terminate in accordance with the Company's stock option agreement.

6.5 Notwithstanding anything contained in this Section 6, in the event the Company carries out a Going Public Transaction, the Long Term Incentive Plan will be amended by the Company as necessary to facilitate such going public transaction. This may include an amendment to the terms of such Long-Term Incentive Plan so as to comply with the terms of the listed entity's stock option plan.

7. **BENEFITS AND INSURANCE**

7.1 The Employee will be eligible to participate in such group health, dental, and disability benefit plans as the Company may provide to its other executive level employees, subject to the terms of those plans. Such benefits may be varied or removed at any time.

8. **EXPENSES**

8.1 The Company will reimburse the Employee's reasonable expenses incurred in the course of employment after the Employee provides an itemized expense report and appropriate receipts, and provided each such expense is incurred in accordance with any applicable Company policies.

9. **VACATION**

9.1 The Employee is entitled to take four (4) weeks of paid vacation per calendar year, pro rated for part years. Vacation may only be taken at a time approved by the Company having regard to business needs of the Company and must be approved in advance.

10. **POLICIES**

10.1 The Employee will comply with all Company policies in place from time to time which are brought to the Employee's attention or of which the Employee should reasonably be aware.

11. **CONFIDENTIALITY**

11.1 In the course of employment, the Employee will have access to, be entrusted with, and acquire detailed and confidential knowledge of the Company's confidential and proprietary business information and operations ("Confidential Information"). Confidential Information includes but is not limited to:

(a) work product resulting from or relating to work or projects performed or to be performed by the Employee or any employee or consultant of the Company, including interim and final lines of inquiry, hypotheses, research, conclusions, surveys, methods, processes, procedures, analyses, techniques, and audits used in connection with any projects, explorations, or research conducted by the Company;

(b) information concerning mineral properties, mineral exploration data, mineral exploration information, mining and exploration proposals;

(c) intellectual property, including any art, process, machine, manufacture or composition of matter or any improvement therein, patents, trademarks, trade secrets, processes, methods, industrial designs, works subject to copyright including architectural works, developments, and trade names; and any applications for registration of any of the foregoing, and any litigation or negotiations;

(d) corporate information, including contractual licensing arrangements, plans, strategies, tactics, policies, resolutions, debt arrangements, equity structure, investors and prospective investors (including all discussions, correspondence, plans and relationship history therewith) and holdings, recruitment, distribution plans, expansion plans, and business opportunities;

(e) financial information, including margins, cost and pricing information, sales, investment, and product plans, and expenses;

(f) personnel information, including personnel lists, resumes, personnel data, employee compensation, organizational structure and performance evaluations;

(g) marketing information, including materials, strategies, techniques, market research data, performance data, and prospects;

(h) operational and scientific information, including software;

(i) technical information, including technical drawings, designs, prototypes, and know-how; and

(j) all other material or information which has or will come into the possession or knowledge of the Employee in connection with his employment.

11.2 "Confidential Information" does not include information already in the public domain other than through a breach of this agreement or a breach of any other obligations of confidentiality under contract or the common law.

11.3 The Employee acknowledges and agrees that his use or disclosure of any Confidential Information to anyone, but particularly to the public or competitors of the Company would be highly detrimental to the Company's interests. The Employee hereby acknowledges and agrees that all Confidential Information is the sole and exclusive property of the Company, whether arising before or after the start of this agreement, and that the right of the Company to maintain such Confidential Information as confidential constitutes a proprietary right which the Company is entitled to protect.

11.4 The Employee covenants and agrees to:

(a) take precautions to keep all Confidential Information, and any information which in good faith and good conscience ought to be treated as confidential, in the strictest confidence;

(b) use commercially reasonable efforts to prevent any other individual or entity from making unauthorized use of the Confidential Information;

(c) not copy, forward by email, download, retain, communicate, use, publish, upload to the internet, or disclose any Confidential Information to any individual or entity, directly or indirectly, or in any manner whatsoever, during or after this agreement, except as reasonably necessary to carry out employment duties, or as otherwise authorized in writing by the Company;

(d) not, directly or indirectly, use any Confidential Information for his own benefit or the benefit of any other individual or entity at any time before, during, or after this agreement; and

(e) forthwith return to the Company all Confidential Information, and all copies thereof, in the Employee's possession or control upon request at any time, and upon the termination of this agreement.

12. **RESTRICTIVE COVENANTS**

12.1 The Employee acknowledges that the Company is engaged in a highly competitive industry and, in order to protect its legitimate business interests, the following restrictions on competition in the markets in which the Company is engaged are necessary and reasonable.

12.2 The Employee acknowledges that the Employee owes to the Company a fiduciary duty.

12.3 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, individually or in partnership or in conjunction with any person(s) or entity, encourage or solicit any employee of the Company to leave the Company for any reason or to accept employment with any other entity.

12.4 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, individually or in partnership or in conjunction with any person(s) or entity, solicit, divert or take away, or attempt to divert or take away the business or patronage of any investor, customer or supplier, or prospective investor, customer or supplier, of the Company which, in the twelve (12) month period prior to the termination of this agreement, were contacted, solicited or served by the Employee or with respect to which the Employee acquired Confidential Information.

12.5 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, whether directly or indirectly, individually or in partnership or in conjunction with any person(s) or entity, engage in any endeavour, employment, activity, consulting, or business, in whole or in part, involving the exploration, assessment, harvesting, transporting, processing, exploitation or distribution of seafloor polymetallic nodules and/or products derived therefrom.

12.6 The Employee covenants and agrees not to usurp for his own benefit or to disclose to any other person(s) or entity, directly or indirectly, any corporate opportunities that the Employee became or becomes aware of by virtue of his employment, whether or not the Company decides to pursue such opportunities.

12.7 The Employee acknowledges and agrees that:

(a) his employment with the Company will allow him unique and substantial access to Confidential Information;

(b) in the event the Employee breaches sections 11 or 12 of this agreement, the Company will be exposed to significant and potentially irreparable damage to its business;

(c) the undertakings in section 12 are reasonable in scope and duration and necessary for the protection of the confidential information, goodwill and legitimate business interests of the Company and its affiliates;

(d) the undertakings in section 12 will not prevent the Employee from earning a living;

(e) the remedy of damages at law for breach of section 11 or 12 would be inadequate and that temporary and permanent relief by way of injunction against the Employee may be granted in any proceedings which the Company may bring to enforce any of the provisions of sections 11 or 12 without necessity of proof of actual damage suffered by the Company or its affiliates; and

(f) the Employee will, if required by the Company, provide evidence to the reasonable satisfaction of the Company that the Employee is not in breach of sections 11 or 12.

13. **INVENTION ASSIGNMENT**

13.1 "Invention" means any item, machine, product, idea, project, process, art, or service created by the Employee and includes, without limitation, intellectual property, works subject to economic copyright, trade-marks, trade names, patents, patent applications, discoveries, ideas, plans, methodologies, designs, research data, trade secrets, materials, equipment, tools, marketing and sales materials, and other materials in any way relating to any Confidential Information of the Company.

13.2 The Employee acknowledges and agrees that any Invention the Employee conceives or makes during employment in connection with the company's business of polymetallic nodule harvesting, production, processing and marketing, whether or not during regular working hours and whether or not using resources and/or tools belonging to the Company, shall be for the benefit of the Company and shall immediately become the exclusive property of the Company.

13.3 The Employee agrees to assign and transfer, exclusively to the Company, any and all of the Employee's right, title, and interest in and to any Invention subject to clause 13.2 together with the goodwill related to all trade-marks, together with all inventions, patents, applications, reissues, continuations, continuations in part, or divisional applications for any patent, and any other intellectual property in any Invention, in Canada and throughout the world, that the Employee has solely or jointly authored, created, conceived, developed, or reduced to practice. The Employee agrees not to apply for protection of any intellectual property rights for any Invention and agrees not to oppose, contest, or seek to invalidate any registration of such rights by the Company.

13.4 Upon the request of the Company at any time, the Employee agrees to sign all necessary documents and do all acts necessary to assign and transfer all Inventions and all rights thereto, under the laws of copyright, patent, trade-mark, industrial design, or otherwise, to the Company, so that the Company can make application through its attorneys for letters patent, copyright, industrial design, or trade-mark registration in Canada, and any and all countries foreign thereto.

13.5 The Employee waives all moral rights, or similar rights, which the Employee may have in any Invention, and to any intellectual property owned by the Company, in Canada and throughout the world.

13.6 The Employee represents and warrants to the Company that any Inventions will be original and will not knowingly violate or infringe upon the rights of any third party under the laws of copyright, trade-mark, privacy, publicity, defamation or otherwise. The Employee agrees to indemnify and hold the Company harmless from and against all loss, cost and damage (including legal fees) incurred or suffered by reason of any violation or infringement upon such rights of any third party.

13.7 The Employee covenants and agrees that during employment, the Employee will not knowingly use or incorporate into any Invention any confidential information or trade secrets of any former company, any person or entity to whom the Employee provided services, or any other person or entity, unless the Employee has obtained all consents, licenses, or other rights necessary to allow the Employee to provide the Company with the assignments and licenses set forth herein.

14. **TERMINATION**

14.1 The Company may terminate this agreement at any time without notice, or pay in lieu of notice, for just cause.

14.2 The Company may terminate this agreement at any time without cause by providing the Employee with sixty (60) days written notice and:

(a) all accrued Base Salary, any declared but unpaid STIP and vacation to the date of termination; and

(b) in the case the Company terminates this agreement within 12 months of the Effective Date, reimbursement of reasonable return expenses incurred by the Employee as a result of any relocation of the Employee that has occurred at the request of the Company.

14.3 If at any time after 1 January 2018 there is a Change of Control, and within six (6) months of such Change of Control:

(a) the Company terminates the Employee's employment without cause; or

(b) a Triggering Event occurs and the Employee delivers notice of his resignation within thirty (30) days of the Triggering Event,

the Employee shall be entitled to receive the applicable amount set out in Section 14.2.

14.4 If the Employee does not deliver the notice of resignation as a result of a Triggering Event within thirty (30) days of such Triggering Event, the Employee shall be deemed to have accepted the Triggering Event.

14.5 The Employee acknowledges and agrees that the payments provided to him by the Company in Section 14.2 are inclusive of his entitlements under applicable employment standards legislation and the common law, and he shall have no further claim in respect of notice of termination, severance, or separation pay of any kind.

14.6 The Employee shall execute a release in a commercially reasonable form, drafted by and acceptable to the Company, in order to receive any amounts in Section 14.2 that exceed his entitlements under applicable employment standards legislation.

14.7 The Employee may resign his employment by providing at least sixty (60) days' written notice. The Company may waive all or part of the notice period in which case no further payment will be due past the last day of employment as specified by the Company or as required by law.

14.8 In the event any of the termination provisions above conflict with applicable employment standards legislation, the requirements of the applicable employment standards legislation will prevail.

14.9 These termination provisions will continue to apply throughout the Employee's employment notwithstanding any changes to the Employee's compensation, title, duties, reporting line, or responsibilities.

14.10 Upon termination, the Employee will immediately return all Company property and any Confidential Information in his possession or control.

15. **APPLICABLE DEFINITIONS**

15.1 "Triggering Event" means any one of the following events which occurs without the Employee's written agreement:

(a) a material adverse change to any of the Employee's duties, powers or title, as they existed immediately prior to a Change of Control;

(b) a material adverse change in the office or body to whom the Employee reports immediately prior to a Change of Control, except if such office or body is of equivalent rank or stature, provided that this shall not include a change resulting from a promotion in the normal course of business;

(c) the Company requiring the Employee to report to work more than 50 kilometres from the Employee's primary place of work or working location(s), as existed immediately prior to a Change of Control; or

(d) a material adverse change in the Employee's remuneration, including salary and benefits.

15.2 "Change of Control" means:

(a) a sale, lease or other disposition of all or substantially all of the property or assets of the Company other than to an affiliate which assumes all, or substantially all, of the obligations of the Company;

(b) a change in the composition of the Company's Board of Directors which occurs at a single meeting of the shareholders of the Company or upon the execution of a shareholder's resolution, such that all the individuals who are members of the Board of Directors immediately prior to such meeting or resolution cease to constitute the Board of Directors immediately following such meeting, without the Board of Directors having approved of such change; or

(c) a change in the composition of the Company's Board of Directors which occurs within a six (6) month period, such that at least sixty-six percent (66%) of the individuals who were members of the Board of Directors immediately prior to the start of such six (6) month period cease to be members of the Board of Directors, on the day immediately following the end of such six (6) month period,

Which, with respect to item (c) above, occurs in connection with any sale, reorganization, amalgamation, merger or other transaction as a result of which an entity or group of entities acting jointly or in concert (whether by means of a shareholder agreement or otherwise) or entities associated or affiliated with any such entity or group within the meaning of the British Columbia *Business Corporations Act* becomes the owner, legal or beneficial, direct or indirect, or obtains control or direction, directly or indirectly, of or over securities of the Company which have attached to them fifty (50%) percent or more of the voting rights attached to all outstanding securities of the Company.

However, and notwithstanding anything contained in this Agreement, the term “Change of Control” will not be triggered from any change relating to a transaction with DV Resources Ltd.

16. **ASSIGNMENT**

16.1 The rights and obligations of the parties under this agreement will enure to the benefit and be binding upon the parties hereto, their respective heirs, executors, administrators, and successors. Only the Company may assign this agreement to affiliates and to any entity which succeeds to all or substantially all of the Company’s business, assets, or property. In the case of a Going Public Transaction, the Company (including any entity that succeeds the Company) may at its election assign this agreement to the listed entity, including without limitation, to DV Resources Ltd.

17. **AMENDMENT AND WAIVER**

17.1 No amendment to any term of this agreement is valid unless set forth in writing and duly executed by the parties. The waiver by the Company or the Employee of a breach of any provision of this agreement will not operate or be construed as a waiver of any subsequent breach by the Company or the Employee.

18. **SEVERABILITY**

18.1 The invalidity or unenforceability of any provision of this agreement will not affect the validity or enforceability of any other provision. Any invalid provision will be severable from this agreement.

19. **RECOURSE ON BREACH**

19.1 The Company and Employee acknowledges that damages would be an insufficient remedy for a breach of this agreement and understands that the Company or Employee may apply to a court for injunctive relief to restrain any breach, or threatened breach, of this agreement.

20. **GOVERNING LAW**

20.1 This agreement is governed by laws of the State of Western Australia and the federal laws of Australia, as applicable. The parties submit to the jurisdiction of the courts of Western Australia.

21. **SURVIVAL**

21.1 The termination of all or any part of this agreement will not affect or prejudice any rights or obligations which have accrued or arisen under this agreement or such part thereof prior to the time of termination and those rights and obligations will survive the termination of this agreement or part thereof.

22. **CONFIDENTIALITY OF AGREEMENT**

22.1 The terms of this agreement are confidential and neither party may disclose its terms without the written consent of the other party with the exception of disclosure to legal or financial advisors, and disclosure required by the law.

23. **ENTIRE AGREEMENT**

23.1 This agreement constitutes the entire agreement between the parties with respect to the Employee's employment.

24. **INDEPENDENT LEGAL ADVICE**

24.1 The Employee acknowledges that it has had independent legal advice or the opportunity to receive same in connection with the execution of this agreement, has read this agreement in its entirety, understands its contents, and is signing this agreement voluntarily and without duress or undue influence from any party.

25. **COUNTERPARTS**

25.1 This agreement may be executed in counterparts, each of which will be deemed to be an original and all of which taken together constitute one agreement.

IN WITNESS WHEREOF, the parties hereto have executed this agreement to be effective as of the Effective Date.

DEEPGREEN RESOURCES INC.

/s/ Gerard Barron

ANTHONY O'SULLIVAN

/s/ Anthony O'Sullivan

Exhibit 10.19

EMPLOYMENT AGREEMENT

This Agreement is made and effective as of 1 September 2018 (the "Effective Date")

Between:

DEEPGREEN METALS INC., a company incorporated pursuant to the laws of British Columbia, Canada with a registered office at 10th Floor, 595 Howe Street, Vancouver BC, Canada V6C 2T5 (the "Company"),

- and -

ERIKA ILVES, an individual residing at Apt 6403, Jaddaf Waterfront Tower D1, Dubai, UAE (the "Employee")

WHEREAS the Company desires to hire the Employee;

AND WHEREAS the Employee agrees to accept employment with the Company on the terms and conditions set out in this agreement;

NOW THIS AGREEMENT WITNESSES that in consideration of the premises and mutual covenants herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by both parties, the parties hereby covenant and agree with each other as follows:

1. TERM

1.1 This agreement will start on the Effective Date and continue for an indefinite term unless terminated by either party in accordance with the terms of this agreement.

2. POSITION AND DUTIES

2.1 The Employee will be employed as ***Head of Business Development and Strategy***, and report to the Chief Executive Officer. The Employee will perform such duties and assume such responsibilities inherent in and consistent with this position, including those provided in Annex A hereto, including any reasonable additional duties and responsibilities as the Company may require and assign to her from time to time.

2.2 The Employee agrees to act as a director or officer of the Company or any of its affiliates (as defined in the British Columbia *Business Corporations Act)* if so requested by the Company and agrees that her Base Salary (as defined below) is adequate consideration for her so acting.

2.3 The Employee will be based out of London, England, or such other location as mutually agreed between the parties from time to time. Notwithstanding the Employee's location, the Employee acknowledges that the nature of her employment requires international travel to places other than her regular place of employment. All travel and related expenses must be incurred in accordance with the Company's travel expense policy. Subject to DeepGreen's work commitments, some flexible work arrangements can be made, and the Employee will be able to work from home from time to time provided the Employee has prior approval from the Company's Chief Executive Officer.

3. CONFLICT OF INTEREST/DUTY OF LOYALTY

3.1 The Employee agrees to act, at all times, in the best interests of the Company. The Employee will not, without the advanced written approval of the Company, directly or indirectly engage in or have an interest in any other enterprise, occupation or profession, or become a principal, agent, director, officer, or employee of another entity which interferes or conflicts with the Employee's duties and responsibilities to the Company or the interests of the Company.

4. BASE COMPENSATION

4.1 Commencing on 1 September 2018 the Company will pay to the Employee an annual salary of US$180,000, less applicable deductions and paid in accordance with the Company's usual payroll practices (the "Base Salary"). Effective 1 January 2019, the Base Salary shall be increased to US$300,000 per annum. The Base Salary covers all time worked.

4.2 The Company will review the Employee's Base Salary on an annual basis. The Company is not obligated to increase the Employee 's Base Salary at any review.

5. SHORT-TERM INCENTIVE PLAN

5.1 The Employee will be eligible to participate in the Company's short-term incentive plan (the "STIP") and to be considered for an annual performance incentive bonus under the STIP. STIP targets and performance goals will be set annually (in advance), by the Company's Chief Executive Officer. Where payable, STIP payments shall be made as soon as practicable following the first quarter of the first financial year following that in which it is earned (and for greater certainty, not when the performance goal is achieved).

5.2 Payments under the STIP shall be satisfied by a combination of the grant of stock options (valued using the Black-Scholes pricing model) and cash. All options granted in satisfaction of STIP payments shall be governed by the Company's stock option plan and any applicable stock option agreement entered into. The ratio of options to cash will not be less than 50% however, by agreement between the CEO and the Employee, the ratio may be adjusted in favor of more options. STIP payments shall be pro-rated for partial years and shall be based on the Employee's then current Base Salary.

5.3 The exercise price for stock options granted pursuant to any STIP payment shall be determined by the Company's Board of Directors with reference to (i) the published market on which the greatest volume of trading in the Company's common shares occurred and the rules of any applicable stock exchange regarding the pricing of stock options; or (ii) if no such published market exists, any and all factors that the Board of Directors considers appropriate in the circumstances at their sole discretion.

5.4 Notwithstanding anything contained in this Section 5, in the event the Company carries out a going public transaction (including without limitation an initial public offering, reverse takeover and/or similar transaction) **("Going Public Transaction")**, the Short-Term Incentive Plan will be amended by the Company as necessary to facilitate such going public transaction. This may include an amendment to the terms of any stock options granted under the Short-Term Incentive Plan so as to comply with the terms of the listed entities' stock option plan.

6. LONG-TERM INCENTIVE PLAN

6.1 The Employee will be eligible to participate in the Company's stock option plan and options may be granted to the Employee thereunder, as and when determined by the Board of Directors of the Company, in its sole discretion.

6.2 The Employee and the Company acknowledge that they have already entered into a stock option agreement, pursuant to which the Employee has been granted stock options.

6.3 All options granted to the Employee under this section 6 shall be governed by the terms of the Company's stock option plan and the applicable stock option agreement entered into between the Company and the Employee, or in the case the Company carries out a Going Public Transaction, then subject to the conditions set forth in the listed entity's stock option plan.

6.4 Subject to Section 6.5, and unless already previously agreed, options granted under the Long-Term Incentive Plan shall (i) vest: (a) as to 25% on the first year anniversary of the date of grant (Year 1); (b) as to 25% on the second anniversary of the date of grant (Year 2); (c) as to 25% on the third year anniversary of the date of grant (Year 3); and (d) as to 25% on the fourth year anniversary of the date of grant (Year 4); (ii) have a term of seven years; and (iii) shall terminate in accordance with the Company's stock option agreement.

6.5 Notwithstanding anything contained in this Section 6, in the event the Company carries out a Going Public Transaction, the Long-Term Incentive Plan will be amended by the Company as necessary to facilitate such going public transaction. This may include an amendment to the terms of such Long-Term Incentive Plan so as to comply with the terms of the listed entity's stock option plan.

7. BENEFITS AND INSURANCE

7.1 The Employee will be eligible to participate in such group health, dental, and disability benefit plans as the Company may provide to its other executive level employees, subject to the terms of those plans. Such benefits may be varied or removed at any time.

8. EXPENSES

8.1 The Company will reimburse the Employee's reasonable expenses incurred in the course of employment after the Employee provides an itemized expense report and appropriate receipts and provided each such expense is incurred in accordance with any applicable Company policies.

9. VACATION

9.1 The Employee is entitled to take four (4) weeks of paid vacation per calendar year, prorated for part years. Vacation may only be taken at a time approved by the Company having regard to business needs of the Company and must be approved in advance.

10. POLICIES

10.1 The Employee will comply with all Company policies in place from time to time which are brought to the Employee's attention or of which the Employee should reasonably be aware .

11. CONFIDENTIALITY

11.1 In the course of employment, the Employee will have access to, be entrusted with, and acquire detailed and confidential knowledge of the Company's confidential and proprietary business information and operations ("Confidential Information"). Confidential Information includes but is not limited to:

(a) work product resulting from or relating to work or projects performed or to be performed by the Employee or any employee or consultant of the Company, including interim and final lines of inquiry, hypotheses, research, conclusions, surveys, methods, processes, procedures, analyses, techniques, and audits used in connection with any projects, explorations, or research conducted by the Company;

(b) information concerning mineral properties, mineral exploration data, mineral exploration information, mining and exploration proposals;

(c) intellectual property, including any art, process, machine, manufacture or composition of matter or any improvement therein, patents, trademarks, trade secrets, processes, methods, industrial designs, works subject to copyright including architectural works, developments, and trade names; and any applications for registration of any of the foregoing, and any litigation or negotiations;

(d) corporate information, including contractual licensing arrangements, plans, strategies, tactics, policies, resolutions, debt arrangements, equity structure, investors and prospective investors (including all discussions, correspondence, plans and relationship history therewith) and holdings, recruitment, distribution plans, expansion plans, and business opportunities;

(e) financial information, including margins, cost and pricing information, sales, investment, and product plans, and expenses;

(f) personnel information, including personnel lists, resumes, personnel data, employee compensation, organizational structure and performance evaluations;

(g) marketing information, including materials, strategies, techniques, market research data, performance data, and prospects;

(h) operational and scientific information, including software;

(i) technical information, including technical drawings, designs, prototypes, and know-how; and

(j) all other material or information which has or will come into the possession or knowledge of the Employee in connection with her employment.

11.2 "Confidential Information" does not include information already in the public domain other than through a breach of this agreement or a breach of any other obligations of confidentiality under contract or the common law.

11.3 The Employee acknowledges and agrees that her use or disclosure of any Confidential Information to anyone, but particularly to the public or competitors of the Company would be highly detrimental to the Company's interests. The Employee hereby acknowledges and agrees that all Confidential Information is the sole and exclusive property of the Company, whether arising before or after the start of this agreement, and that the right of the Company to maintain such Confidential Information as confidential constitutes a proprietary right which the Company is entitled to protect.

11.4 The Employee covenants and agrees to:

(a) take precautions to keep all Confidential Information, and any information which in good faith and good conscience ought to be treated as confidential, in the strictest confidence;

(b) use commercially reasonable efforts to prevent any other individual or entity from making unauthorized use of the Confidential Information;

(c) not copy, forward by email, download, retain, communicate, use, publish, upload to the internet, or disclose any Confidential Information to any individual or entity, directly or indirectly, or in any manner whatsoever, during or after this agreement, except as reasonably necessary to carry out employment duties, or as otherwise authorized in writing by the Company;

(d) not, directly or indirectly, use any Confidential Information for her own benefit or the benefit of any other individual or entity at any time before, during, or after this agreement; and

(e) forthwith return to the Company all Confidential Information, and all copies thereof, in the Employee's possession or control upon request at any time, and upon the termination of this agreement.

12. RESTRICTIVE COVENANTS

12.1 The Employee acknowledges that the Company is engaged in a highly competitive industry and, in order to protect its legitimate business interests, the following restrictions on competition in the markets in which the Company is engaged are necessary and reasonable.

12.2 The Employee acknowledges that the Employee owes to the Company a fiduciary duty.

12.3 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, individually or in partnership or in conjunction with any person(s) or entity, encourage or solicit any employee of the Company to leave the Company for any reason or to accept employment with any other entity.

12.4 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, individually or in partnership or in conjunction with any person(s) or entity, solicit, divert or take away, or attempt to divert or take away the business or patronage of any investor, customer or supplier, or prospective investor, customer or supplier, of the Company which, in the twelve (12) month period prior to the termination of this agreement, were contacted, solicited or served by the Employee or with respect to which the Employee acquired Confidential Information.

12.5 The Employee covenants and agrees that during employment and for a twelve (12) month period following termination of employment for any reason, the Employee will not, whether directly or indirectly, individually or in partnership or in conjunction with any person(s) or entity, engage in any endeavor, employment, activity, consulting, or business, in whole or in part, involving the exploration, assessment,· harvesting, transporting, processing, exploitation or distribution of seafloor polymetallic nodules and/or products derived therefrom.

12.6 The Employee covenants and agrees not to usurp for her own benefit or to disclose to any other person(s) or entity, directly or indirectly, any corporate opportunities that the Employee became or becomes aware of by virtue of her employment, whether or not the Company decides to pursue such opportunities.

12.7 The Employee acknowledges and agrees that:

(a) her employment with the Company will allow her unique and substantial access to Confidential Information;

(b) in the event the Employee breaches sections 11 or 12 of this agreement, the Company will be exposed to significant and potentially irreparable damage to its business;

(c) the undertakings in section 12 are reasonable in scope and duration and necessary for the protection of the confidential information, goodwill and legitimate business interests of the Company and its affiliates;

(d) the undertakings in section 12 will not prevent the Employee from earning a living;

(e) the remedy of damages at law for breach of section 11 or 12 would be inadequate and that temporary and permanent relief by way of injunction against the Employee may be granted in any proceedings which the Company may bring to enforce any of the provisions of sections 11 or 12 without necessity of proof of actual damage suffered by the Company or its affiliates; and

(f) the Employee will, if required by the Company, provide evidence to the reasonable satisfaction of the Company that the Employee is not in breach of sections 11 or 12.

13. INVENTION ASSIGNMENT

13.1 "Invention" means any item, machine, product, idea, project, process, art, or service created by the Employee and includes, without limitation, intellectual property, works subject to economic copyright, trade-marks, trade names, patents, patent applications, discoveries, ideas, plans, methodologies, designs, research data, trade secrets, materials, equipment, tools, marketing and sales materials, and other materials in any way relating to any Confidential Information of the Company.

13.2 The Employee acknowledges and agrees that any Invention the Employee conceives or makes during employment in connection with the company's business of polymetallic nodule harvesting, production, processing and marketing, whether or not during regular working hours and whether or not using resources and/or tools belonging to the Company, shall be for the benefit of the Company and shall immediately become the exclusive property of the Company.

13.3 The Employee agrees to assign and transfer, exclusively to the Company, any and all of the Employee 's right, title, and interest in and to any Invention subject to clause 13.2 together with the goodwill related to all trade-marks, together with all inventions, patents, applications, reissues, continuations, continuations in part, or divisional applications for any patent, and any other intellectual property in any Invention, in Canada and throughout the world, that the Employee has solely or jointly authored, created, conceived, developed, or reduced to practice. The Employee agrees not to apply for protection of any intellectual property rights for any Invention and agrees not to oppose, contest, or seek to invalidate any registration of such rights by the Company.

13.4 Upon the request of the Company at any time, the Employee agrees to sign all necessary documents and do all acts necessary to assign and transfer all Inventions and all rights thereto, under the laws of copyright, patent, trade-mark, industrial design, or otherwise, to the Company, so that the Company can make application through its attorneys for letters patent, copyright, industrial design, or trade-mark registration in Canada, and any and all countries foreign thereto.

13.5 The Employee waives all moral rights, or similar rights, which the Employee may have in any Invention, and to any intellectual property owned by the Company, in Canada and throughout the world.

13.6 The Employee represents and warrants to the Company that any Inventions will be original and will not knowingly violate or infringe upon the rights of any third party under the laws of copyright, trade-mark, privacy, publicity, defamation or otherwise. The Employee agrees to indemnify and hold the Company harmless from and against all loss, cost and damage (including legal fees) incurred or suffered by reason of any violation or infringement upon such rights of any third party.

13.7 The Employee covenants and agrees that during employment, the Employee will not knowingly use or incorporate into any Invention any confidential information or trade secrets of any former company, any person or entity to whom the Employee provided services, or any other person or entity, unless the Employee has obtained all consents, licenses, or other rights necessary to allow the Employee to provide the Company with the assignments and licenses set forth herein.

14. TERMINATION

14.1 The Company may terminate this agreement at any time without notice, or pay in lieu of notice, for just cause.

14.2 The Company may terminate this agreement at any time without cause by providing the Employee with sixty (60) days written notice and:

(a) all accrued Base Salary, any declared but unpaid STIP and vacation to the date of termination; and

(b) in the case the Company terminates this agreement within 12 months of the Effective Date, reimbursement of reasonable return expenses incurred by the Employee as a result of any relocation of the Employee that has occurred at the request of the Company.

14.3 If at any time after 1 January 2018 there is a Change of Control, and within six (6) months of such Change of Control:

(a) the Company terminates the Employee's employment without cause; or

(b) a Triggering Event occurs and the Employee delivers notice of her resignation within thirty (30) days of the Triggering Event, the Employee shall be entitled to receive the applicable amount set out in Section 14.2.

14.4 If the Employee does not deliver the notice of resignation as a result of a Triggering Event within thirty (30) days of such Triggering Event, the Employee shall be deemed to have accepted the Triggering Event.

14.5 The Employee acknowledges and agrees that the payments provided to her by the Company in Section 14.2 are inclusive of her entitlements under applicable employment standards legislation and the common law, and she shall have no further claim in respect of notice of termination, severance, or separation pay of any kind.

14.6 The Employee shall execute a release in a commercially reasonable form, drafted by and acceptable to the Company, in order to receive any amounts in Section 14.2 that exceed her entitlements under applicable employment standards legislation.

14.7 The Employee may resign her employment by providing at least sixty (60) days' written notice. The Company may waive all or part of the notice period in which case no further payment will be due past the last day of employment as specified by the Company or as required by law.

14.8 In the event any of the termination provisions above conflict with applicable employment standards legislation, the requirements of the applicable employment standards legislation will prevail.

14.9 These termination provisions will continue to apply throughout the Employee's employment notwithstanding any changes to the Employee's compensation, title, duties, reporting line, or responsibilities.

14.10 Upon termination, the Employee will immediately return all Company property and any Confidential Information in her possession or control.

15. APPLICABLE DEFINITIONS

15.1 "Triggering Event" means any one of the following events which occurs without the Employee's written agreement:

(a) a material adverse change to any of the Employee's duties, powers or title, as they existed immediately prior to a Change of Control;

(b) a material adverse change in the office or body to whom the Employee reports immediately prior to a Change of Control, except if such office or body is of equivalent rank or stature, provided that this shall not include a change resulting from a promotion in the normal course of business;

(c) the Company requiring the Employee to report to work more than 50 kilometres from the Employee's primary place of work or working location(s), as existed immediately prior to a Change of Control; or

(d) a material adverse change in the Employee's remuneration, including salary and benefits.

15.2 "Change of Control" means:

(a) a sale, lease or other disposition of all or substantially all of the property or assets of the Company other than to an affiliate which assumes all, or substantially all, of the obligations of the Company;

(b) a change in the composition of the Company's Board of Directors which occurs at a single meeting of the shareholders of the Company or upon the execution of a shareholder's resolution, such that all the individuals who are members of the Board of Directors immediately prior to such meeting or resolution cease to constitute the Board of Directors immediately following such meeting, without the Board of Directors having approved of such change; or

(c) a change in the composition of the Company's Board of Directors which occurs within a six (6) month period, such that at least sixty-six percent (66%) of the individuals who were members of the Board of Directors immediately prior to the start of such six (6) month period cease to be members of the Board of Directors, on the day immediately following the end of such six (6) month period,

Which, with respect to item (c) above, occurs in connection with any sale, reorganization, amalgamation, merger or other transaction as a result of which an entity or group of entities acting jointly or in concert (whether by means of a shareholder agreement or otherwise) or entities associated or affiliated with any such entity or group within the meaning of the British Columbia *Business Corporations Act* becomes the owner, legal or beneficial, direct or indirect, or obtains control or direction, directly or indirectly, of or over securities of the Company which have attached to them fifty (50%) percent or more of the voting rights attached to all outstanding securities of the Company.

16. ASSIGNMENT

16.1 The rights and obligations of the parties under this agreement will enure to the benefit and be binding upon the parties hereto, their respective heirs, executors, administrators, and successors. Only the Company may assign this agreement to affiliates and to any entity which succeeds to all or substantially all of the Company's business, assets, or property. In the case of a Going Public Transaction, the Company (including any entity that succeeds the Company) may at its election assign this agreement to the listed entity.

17. AMENDMENT AND WAIVER

17.1 No amendment to any term of this agreement is valid unless set forth in writing and duly executed by the parties. The waiver by the Company or the Employee of a breach of any provision of this agreement will not operate or be construed as a waiver of any subsequent breach by the Company or the Employee.

18. SEVERABILITY

18.1 The invalidity or unenforceability of any provision of this agreement will not affect the validity or enforceability of any other provision. Any invalid provision will be severable from this agreement.

19. RECOURSE ON BREACH

19.1 The Company and Employee acknowledges that damages would be an insufficient remedy for a breach of this agreement and understands that the Company or Employee may apply to a court for injunctive relief to restrain any breach, or threatened breach, of this agreement.

20. GOVERNING LAW

20.1 This agreement is governed by laws of the State of British Columbia. The parties submit to the jurisdiction of the courts of Vancouver.

21. SURVIVAL

21.1 The termination of all or any part of this agreement will not affect or prejudice any rights or obligations which have accrued or arisen under this agreement or such part thereof prior to the time of termination and those rights and obligations will survive the termination of this agreement or part thereof.

22. CONFIDENTIALITY OF AGREEMENT

22.1 The terms of this agreement are confidential and neither party may disclose its terms without the written consent of the other party with the exception of disclosure to legal or financial advisors, and disclosure required by the law.

23. ENTIRE AGREEMENT

23.1 This agreement constitutes the entire agreement between the parties with respect to the Employee's employment.

24. INDEPENDENT LEGAL ADVICE

24.1 The Employee acknowledges that it has had independent legal advice or the opportunity to receive same in connection with the execution of this agreement, has read this agreement in its entirety, understands its contents, and is signing this agreement voluntarily and without duress or undue influence from any party.

25. COUNTERPARTS

25.1 This agreement may be executed in counterparts, each of which will be deemed to be an original and all of which taken together constitute one agreement.

IN WITNESS WHEREOF, the parties hereto have executed this agreement to be effective as of the Effective Date.

DEEPGREEN METALS INC.

/s/ Gerard Barron

ERIKA ILVES

/s/ Erika Ilves

EXHIBIT “A”

Role responsibilities

The Head of Strategy & Business Development shall have the following responsibilities:

- Reduce time to production/scale through architecting world-class technical partnerships for offshore and onshore production
- Help establish and develop ‘Clean Metals’ as a new purchasing category
- Secure offtake agreements with industrial users of DG’s metals
- Oversee the development of DG’s blockchain strategy to enable provenance tracking

DEEPGREEN METALS INC.
(FORMERLY, DEEPGREEN RESOURCES INC.)

STOCK OPTION PLAN

1. **Purpose of the Plan**

1.1 The purpose of the Plan is to give to Eligible Persons the opportunity to participate in the success of the Corporation by granting to such individuals options to acquire common shares of the Corporation in accordance with the terms of the plan, thereby giving such Eligible Persons a proprietary interest in the Corporation.

2. **Defined Terms**

Where used herein, the following terms shall have the following meanings:

2.1 "**Acquiring Person**" means, any Person who is the beneficial owner of twenty percent (20%) or more of the outstanding Shares of the Corporation except where there is evidence showing that the Person does not materially affect the control of the Corporation.

2.2 "**BCSA**" means the *Securities Act* (British Columbia).

2.3 "**Blackout Period**" means a period of time during which the Optionee cannot exercise an Option, or sell the Shares issuable pursuant to an exercise of Options, due to applicable insider trading laws.

2.4 "**Board**" means the board of directors of the Corporation, or, if established and duly authorized to act with respect to this Plan, any committee of the board of directors of the Corporation.

2.5 "**Broker**" has the meaning specified in Section 11.1.

2.6 "**Change of Control Event**" has the meaning specified in Section 9.1.

2.7 "**Company**" means, unless specifically indicated otherwise, a corporation, incorporated association or organization, body corporate, partnership, trust, association or other entity other than an individual.

2.8 "**Consultant**" has the meaning specified in the Exchange Manual.

2.9 "**Corporation**" means DeepGreen Metals Inc. and its successors.

2.10 "**Disability**" means any disability with respect to an Optionee which the Board, in its sole and unfettered discretion, considers likely to permanently prevent the Optionee from:

(a) being employed or engaged by the Corporation or its subsidiaries in a position the same as or similar to that in which he was last employed or engaged by the Corporation or its subsidiaries; or

(b) acting as a director or officer of the Corporation or its subsidiaries.

2.11 "**Disinterested Shareholder Approval**" means a majority of the votes attaching to shares voted at a meeting of shareholders of the Corporation, excluding the votes attaching to shares held by persons with an interest in the subject matter of the resolution, in accordance with Exchange Manual.

2.12 "**Effective Time**" means, in relation to a Change of Control Event, the time at which the Change of Control Event is deemed to have been completed.

2.13 "**Eligible Person**" means:

(a) a *bona fide* director, senior officer, or Employee of the Corporation or any of its Subsidiaries;

(b) a Company that is wholly-owned by any of the foregoing; or

(c) a Consultant.

2.14 "**Employee**" has the meaning specified in the Exchange Manual.

2.15 "**Event of Termination**" has the meaning specified in Section 6.2.

2.16 "**Exchange**" means the Toronto Stock Exchange, or, if any time the Shares are not listed for trading on such exchange, any other stock exchange (including the TSX Venture Exchange) on which the Shares are then listed and posted for trading from time to time as may be designated by the Board.

2.17 "**Exchange Manual"** means the Corporate Finance Manual of the Exchange.

2.18 "**Expiry Time**" means, with respect to any Option, the close of business on the date upon which such Option expires pursuant to the Stock Option Agreement.

2.19 "**Grant Date**" means the date on which an Option is granted.

2.20 "**Insider**" has the meaning specified in the Exchange Manual.

2.21 "**Investor Relations Activities**" has the meaning specified in the Exchange Manual.

2.22 "**Market Price**" of Shares at any Grant Date means the last closing price per Share on the last day on which Shares were traded prior to the day on which the Company announces the grant of the Option or, if the grant is not announced, on the Grant Date.

2.23 "**New Share**" has the meaning specified in Section 9.1(g)(iii).

2.24 "**Option**" means an option to purchase Shares granted to an Eligible Person under the Plan.

2.25 "**Option Price**" means the price per Share at which Optioned Shares may be purchased under an Option and as specified in a Stock Option Agreement, as the same may be adjusted from time to time in accordance with Article 8.

2.26 **"Optioned Shares"** means the Shares issuable pursuant to an exercise of Options.

2.27 "**Optionee**" means an Eligible Person to whom an Option has been granted and who continues to hold such Option.

2.28 "**Person**" means any individual, firm, partnership, limited partnership, limited liability company or partnership, unlimited liability company, joint stock company, association, trust, trustee, executor, administrator, legal or personal representative, government, governmental body, entity or authority, group, body corporate, corporation, unincorporated organization or association, syndicate, joint venture or any other entity, whether or not having legal personality, and any of the foregoing in any derivative, representative or fiduciary capacity and pronouns have a similar extended meaning.

2.29 "**Plan**" means this stock option plan of the Corporation, as the same may be amended from time to time.

2.30 "**Shares**" means the common shares of the Corporation.

2.31 "**Stock Option Agreement**" means a written agreement between the Corporation and an Optionee specifying the terms of the Option being granted to the Optionee under the Plan.

2.32 "**Subsidiary**" means any corporation which is a subsidiary, as such term is defined in Subsection 1(1) of the BCSA.

2.33 "**Withholding Obligations**" has the meaning specified in Section 11.1.

3. **Administration of the Plan**

3.1 The Plan shall be administered by the Board.

3.2 The Board shall have the power, where consistent with the general purpose and intent of the Plan and subject to the specific provisions of the Plan to:

(a) establish policies and to adopt rules and regulations for carrying out the purposes, provisions and administration of the Plan;

(b) interpret and construe the Plan and to determine all questions arising out of the Plan or any Option, and any such interpretation, construction or determination made by the Board shall be final, binding and conclusive for all purposes;

(c) determine the number of Optioned Shares issuable on the exercise of each Option, the Option Price thereunder and the time or times when the Options will be granted, exercisable and expire;

(d) determine if the Optioned Shares which are issuable on the exercise of an Option will be subject to any restrictions upon the exercise of such Option;

(e) prescribe the form of the instruments relating to the grant, exercise and other terms of Options;

(f) determine, in accordance with Section 9.1, how to administer the Plan in connection with a Change of Control Event;

(g) make any changes to the Plan reasonably necessary to meet the Exchange requirements should the Corporation apply for a listing on the Exchange.

3.3 A member of the Board may be entitled to participate in the Plan only if such member does not participate in any manner whatsoever in the granting of any Options to, the terms and conditions of, or any other determinations made with respect to, such member of the Board or to such Option.

3.4 The Board may, in its discretion, require as conditions to the grant or exercise of any Option that the Optionee shall have, among other things:

(a) represented, warranted and agreed in form and substance satisfactory to the Corporation that such Optionee is acquiring and will acquire such Option and the Optioned Shares for such Optionee's own account, and not with a view to or in connection with any distribution or resale, that such Optionee has had access to such information as is necessary to enable such Optionee to evaluate the merits and risks of such investment and that such Optionee is able to bear the economic risk of investing in the Shares, that such Optionee has not relied upon any representation from the Corporation, its officers or directors, and provided such other representations, warranties and undertakings as are contained in the Corporation's standard subscription agreement;

(b) agreed to restrictions on transfer in form and substance satisfactory to the Corporation and to an endorsement on any option agreement or certificate representing the Shares making appropriate reference to such restrictions; and

(c) agreed to indemnify the Corporation in connection with the foregoing.

4. **Shares Subject to the Plan**

4.1 Subject to Article 8, and if the Corporation is not listed on the Exchange, the maximum number of Shares with respect to which Options may be granted from time to time pursuant to the Plan shall not exceed 20% of the Corporation's outstanding Shares (on a non-diluted basis), however should the Corporation list on the Exchange, the Plan shall incorporate provisions in line with Exchange requirements regarding the maximum number of Shares with respect to which Options may be granted from time to time, and shall be amended as required to comply with the Exchange.

4.2 Should the Corporation list on the Exchange, the number of Shares which may be issuable under the Plan and all of the Corporation's other previously established or proposed share compensation arrangements, within a one-year period:

(a) to any one Optionee shall not exceed 5% of the total number of issued and outstanding Shares on the Grant Date on a non-diluted basis, unless the Corporation has obtained Disinterested Shareholder Approval;

(b) to Insiders as a group shall not exceed 10% of the total number of issued and outstanding Shares on the Grant Date on a non-diluted basis;

(c) to any one Consultant shall not exceed 2% of the total number of issued and outstanding Shares on the Grant Date on a non-diluted basis; and

(d) to all Eligible Persons who undertake Investor Relations Activities shall not exceed 2% in the aggregate of the total number of issued and outstanding Shares on the Grant Date on a non-diluted basis.

4.3 If any Option is exercised, terminated, cancelled or has expired without being fully exercised, any unissued Shares which have been reserved to be issued upon the exercise of the Option shall become available to be issued upon the exercise of Options subsequently granted under the Plan.

5. **Eligibility, Grant and Terms of Options**

5.1 Options may be granted to any Eligible Person in accordance with Section 5.2.

5.2 Options may be granted by the Corporation pursuant to the recommendations of a committee of the Board from time to time provided and to the extent that such decisions are approved by the Board.

5.3 If, as and when any Shares have been duly purchased and paid for under the terms of an Option, such Optioned Shares shall be conclusively deemed to be allotted and issued as fully paid and non-assessable Shares at the price paid therefor.

5.4 The term of an Option shall not exceed 10 years from the date of the grant of the Option.

5.5 Should the Corporation list on the Exchange, the Option Price shall not be less than the Market Price prevailing on the Grant Date less applicable discount, if any, permitted by the Exchange and approved by the Board.

5.6 With respect to any Options granted to Employees or Consultants, the Corporation represents that that the Optionee is a bona fide Employee or Consultant, as applicable.

5.7 An Option shall vest and may be exercised (in each case to the nearest full Share) in whole or in part at any time during the term of such Option after the date of the grant as determined by the resolution of the Board granting the Option and as contained in the terms of a Stock Option Agreement. No fractional Shares may be purchased or issued under the Plan.

5.8 Subdivision 83A-C of the Income Tax Assessment Act (Australia) applies to this Stock Option Plan (subject to the requirements of the ITTA 1997).

5.9 Notwithstanding anything else contained in this Plan, if the Corporation is listed on the Exchange and an Option expires during or within 10 business days of a Blackout Period applicable to the relevant Optionee, then the expiration date for that Option shall be the date that is the eleventh business day after the expiry date of the Blackout Period. This section applies to all Options outstanding under this Plan.

6. **Termination of Employment, Consultancy or Directorship**

6.1 Subject to:

(a) Sections 6.2 and 6.3 hereof;

(b) any express resolution passed by the Board with respect to an Option; and

(c) any Stock Option Agreement, resignation and mutual release agreement, employment agreement, severance agreement or any other agreement between the Corporation and the Optionee containing provisions to the contrary regarding termination of employment, consultancy or directorship, resignation or retirement,

an Option, and all rights to purchase Optioned Shares pursuant thereto shall expire and terminate as detailed in Sections 6.1(d), (e) and (f) below:

(d) if the Corporation is not listed on the Exchange at the time, in the case of (i) termination of employment, consultancy or directorship without cause, (ii) resignation of an Eligible Person or (iii) retirement of an Eligible Person, any unvested Options will expire and terminate and be cancelled on the date of such termination, retirement or resignation, and any vested Options will continue until the Expiry Time;

(e) if the Corporation is listed on the Exchange at the time, in the case of (i) termination of employment, consultancy or directorship without cause, (ii) resignation of an Eligible Person or (iii) retirement of an Eligible Person, any unvested Options will expire and terminate and be cancelled on the date of such termination, retirement or resignation, and any vested Options will expire and terminate 180 days from the date of such termination, retirement or resignation or on the Expiry Time, whichever is earlier; and

(f) in the case of termination of employment, consultancy or directorship for cause, such Option and all rights to purchase Optioned Shares in respect thereof shall expire and terminate on the date of such termination and shall be cancelled as of that date or on the Expiry Time, whichever is earlier.

6.2 If, before the Expiry Time of an Option, an Optionee shall cease to be an Eligible Person (an "**Event of Termination**") as a result of the Optionee's Disability, then the Board, at its discretion, may allow the Optionee to exercise any vested Options to the extent that the Optionee was entitled to do so at the time of such Event of Termination, at any time up to and including, but not after, a date twelve months following the date of such Event of Termination or on the Expiry Time, whichever is earlier.

6.3 If an Optionee dies before the Expiry Time of an Option, the Optionee's legal representative(s) may, subject to the terms of the Option and the Plan, exercise any vested Options to the extent that the Optionee was entitled to do so at the date of the Optionee's death at any time up to and including, but not after, a date twelve months following the date of the Optionee's death or on the Expiry Time, whichever is earlier.

6.4 For greater certainty, Options shall not be affected by any change of employment of the Optionee or by the Optionee ceasing to be a director, senior officer or employee of the Corporation or any of its Subsidiaries provided that the Optionee continues to be an Eligible Person.

6.5 If the Optionee is a Company that is wholly owned by an Eligible Person, the references to the Optionee in this Article 6 shall be deemed to refer to the Eligible Person associated with such Company.

6.6 Notwithstanding anything contained in this Section 6, the Board may when granting an Option to a Consultant or Eligible Person impose in a Stock Option Agreement specific rules respecting the cessation of participation of such Consultant or Eligible Person, which rules may vary from, and shall supersede, those contained in this Section 6.

7. **Exercise of Options**

7.1 Subject to the provisions of the Plan, an Option may be exercised from time to time by delivery to the Corporation at its principal office in Vancouver, British Columbia of a written notice of exercise (substantially in the form attached hereto as Schedule "B") specifying the number of Optioned Shares with respect to which the Option is being exercised and accompanied by payment in full, by cash or cheque, of the Option Price of the Shares then being purchased and, if required by the Corporation, the amount necessary to satisfy any applicable Withholding Obligations. The Optioned Shares so purchased shall be issued and delivered to the Optionee within a reasonable time following the receipt of such notice and payment. The transfer and delivery of any Optioned Shares issued upon exercise of any Option shall be effected according to the procedures established by the transfer agent of the Corporation for the transfer and delivery of the Shares.

7.2 Notwithstanding any of the provisions contained in the Plan or in any Option, the Corporation's obligation to issue Shares to an Optionee pursuant to the exercise of any Option shall be subject to:

(a) completion of such registration or other qualification of such Shares or obtaining approval of such governmental or regulatory authority as the Corporation shall determine to be necessary or advisable in connection with the authorization, issuance or sale thereof;

(b) in case the Corporation is listed on an Exchange;

i) the Corporation complying with the rules and regulations of the Exchange; and

ii) the admission of such Shares to listing on the Exchange;

(c) the receipt from the Optionee of such representations, warranties, agreements and undertakings, as the Corporation or its counsel determines to be necessary or advisable (including without limitation the representations, warranties and undertakings as are contained in the Corporation's standard subscription agreement); and

(d) the satisfaction of any conditions on exercise, including those prescribed under Section 3.4.

7.3 No member of the Board shall be liable for any action or determination taken or made in good faith in the administration, interpretation, construction or application of the Plan or any Options granted under it.

7.4 Options shall be evidenced by a Stock Option Agreement, instrument or certificate in such form not inconsistent with this Plan as the Board may from time to time determine as provided for under Subsection 3.2(e) (substantially in the form attached hereto as Schedule "A" or such other form and containing such other terms as the Board determines from time to time).

8. **Certain Adjustments**

8.1 In the event of any reorganization, recapitalization, stock split, stock dividend, combination of shares, merger, consolidation, rights offering or any other corporate change involving a change to the Shares at any time after the grant of any Option to any Optionee and prior to the expiration of the term of such Option, the Corporation shall deliver to such Optionee at the time of any subsequent exercise of his or her Option in accordance with the terms hereof, in lieu of the number of Optioned Shares to which he or she was entitled upon such exercise, but for the same aggregate consideration therefore, such number of Optioned Shares as such Optionee would have held as a result of such change if on the record date thereof the Optionee had been the registered holder of the number of Optioned Shares to which he was previously entitled upon such exercise.

8.2 In the event the Corporation should declare and pay a special cash dividend or other distribution out of the ordinary course, a special dividend in specie on the Shares, or a stock dividend other than in the ordinary course, the Option Price of all Options outstanding on the record date of such dividend or other distribution shall be reduced by an amount equal to the cash payment or other distribution or the fair market value of the dividend in specie or stock dividend or other distribution, as determined by the Board in its sole discretion but subject to all necessary regulatory approvals.

9. **Change of Control Event**

9.1 If at any time when an Option granted under this Plan remains unexercised with respect to any Shares and:

(a) a Person makes an offer to acquire Shares that, regardless of whether the acquisition is completed, would make the Person an Acquiring Person;

(b) an Acquiring Person makes an offer, regardless of whether the acquisition is completed, to acquire Shares;

(c) the Corporation proposes to sell all or substantially all of its assets and undertakings;

(d) the Corporation proposes to merge, amalgamate or be absorbed by or into any other corporation (save and except for a Subsidiary) under any circumstances which involve or may involve or require the liquidation of the Corporation, a distribution of its assets among its shareholders, or the termination of the corporate existence of the Corporation;

(e) the Corporation proposes an arrangement as a result of which a majority of the outstanding Shares of the Corporation would be acquired by a third party; or

(f) any other form of transaction is proposed which the majority of the Board determines is reasonably likely to have similar effect to any of the foregoing (each a "**Change of Control Event**"),

then

(g) in connection with any of the foregoing Change of Control Events, the Board in its sole discretion may, provided any requirement is applied on a non-discriminatory basis, require that:

i) the Corporation accelerate the vesting of the Option and the time for the fulfilment of any conditions or restrictions on such vesting;

ii) an Option granted under this Plan be exercised (whether or not such Option has vested) by the Optionee at any time up to and including (but not after) the Effective Time of the Change of Control Event, and any Options not exercised by the Effective Time of the Change of Control Event will be deemed to have expired;

iii) an Option granted under this Plan may, if accepted by the holder, be cancelled by the Corporation for a cash payment equal to the difference between the closing price of the Shares on the Exchange on a trading day that is a determined number of days prior to the Effective Time of the Change of Control Event and the Option Price; or

iv) an Option granted under this Plan be exchanged for an option to acquire the number of securities as are distributed to the shareholders of the Corporation (each, a "**New Share**") equal to (i) the Share to New Share exchange ratio multiplied by (ii) the number of Shares subject to such Option immediately prior to the Effective Time of the Change of Control Event, provided that any such replacement option must provide that it survives for a period of not less than one year from the Effective Time of the Change of Control Event, regardless of the continuing directorship, officership or employment of the holder.

9.2 For greater certainty, and notwithstanding anything else to the contrary contained in this Plan, the Board shall have the power, in its sole discretion, in any Change of Control Event which may or has occurred, to make such arrangements as it shall deem appropriate for the exercise of outstanding Options including, without limitation, to modify the terms of this Plan and/or the Options. If the Board exercises such power, the Options shall be deemed to have been amended to permit the exercise thereof in whole or in part by the Optionee at any time or from time to time as determined by the Board prior to or in conjunction with completion of the Change of Control Event.

9.3 In the event that a take-over bid is made for the Shares, the Board shall have the power, in its sole discretion, to modify the terms of the Plan and/or the Options, including, for greater certainty, to cause the vesting of all unvested Options or to otherwise assist the Optionees to tender into a take-over bid.

10. **Amendment or Discontinuance of the Plan**

10.1 The Board may suspend or terminate the Plan at any time, or from time to time amend the terms of the Plan or of any Option granted under the Plan and any stock option agreement relating thereto, provided that any such suspension, termination or amendment:

(a) complies with applicable law, including applicable requirements relating to requisite shareholder approval or any other relevant regulatory body;

(b) is, in the case where the Corporation is listed on an Exchange, compliant with the requirements of the Exchange, including applicable requirements relating to prior approval of the Exchange;

(c) is, in the case of an amendment that materially adversely affects the rights of any Optionee, made with consent of such Optionee; and

(d) is, in the case of any reduction in the Option Price of Options held by Optionees that are Insiders at the time of the proposed reduction and where the Corporation is listed on an Exchange, subject to approval by disinterested shareholders of the Corporation in accordance with the Exchange Manual.

10.2 If the Plan is terminated, the provisions of the Plan and any administrative guidelines and other rules and regulations adopted by the Board and in force on the date of termination will continue in effect as long as any Option or any rights pursuant thereto remain outstanding and, notwithstanding the termination of the Plan, the Board will remain able to make such amendments to the Plan or the Options as they would have been entitled to make if the Plan were still in effect.

10.3 No amendment, suspension or discontinuance of the Plan may contravene the requirements of any securities commission or regulatory body to which the Plan or the Corporation is now or may hereafter be subject. In case the Corporation is listed on an Exchange, no amendment, suspension or discontinuance of the Plan may contravene the requirements of the Exchange.

10.4 Notwithstanding anything contained in the Plan, the Board may make any changes to the Plan it considers reasonably necessary to meet the Exchange requirements should the Corporation apply for a listing on the Exchange.

11. **Withholding Obligations**

11.1 The Corporation may withhold from any amount payable to an Optionee, either under the Plan or otherwise, such amounts as are required by law to be withheld or deducted as a consequence of his or her exercise of Options or other participation in this Plan ("**Withholding Obligations**"). The Corporation shall have the right, in its discretion, to satisfy any Withholding Obligations by:

(a) selling or causing to be sold, on behalf of any Optionee, such number of Shares issued to the Optionee on the exercise of Options as is sufficient to fund the Withholding Obligations;

(b) retaining the amount necessary to satisfy the Withholding Obligations from any amount which would otherwise be delivered, provided or paid to the Optionee by the Corporation, whether under this Plan or otherwise;

(c) requiring the Optionee, as a condition of exercise under Article 3 to (i) remit the amount of any such Withholding Obligations to the Corporation in advance; (ii) reimburse the Corporation for any such Withholding Obligations; or (iii) cause a broker who sells Shares acquired by the Optionee on behalf of the Optionee to withhold from the proceeds realized from such sale the amount required to satisfy any such Withholding Obligations and to remit such amount directly to the Corporation; and/or

(d) making such other arrangements as the Corporation may reasonably require.

The sale of Shares by the Corporation, or by a broker engaged by the Corporation (the "Broker"), under clause 11.1 above will be made on the Exchange. The Optionee consents to such sale and grants to the Corporation an irrevocable power of attorney to effect the sale of such Shares on his or her behalf and acknowledges and agrees that (i) the number of Shares sold shall, at a minimum, be sufficient to fund with Withholding Obligations net of all selling costs, which costs are the responsibility of the Optionee and which the Optionee hereby authorizes to be deducted from the proceeds of such sale; (ii) in effecting the sale of any such shares, the Corporation or the Broker will exercise its sole judgement as to the timing and the manner of sale and will not be obligated to seek or obtain a minimum price; and (iii) neither the Corporation nor the Broker will be liable for any loss arising out of any sale of such Shares including any loss relating to the pricing, manner or timing of such sales or any delay in transferring any Shares to an Optionee or otherwise. The Optionee further acknowledges that the sale price of Shares will fluctuate with the market price of the Corporation's Shares and no assurance can be given that any particular price will be received upon any sale.

12. **Miscellaneous Provisions**

12.1 The operation of this Plan and the issuance and exercise of all Options and Optioned Shares contemplated by this Plan are subject to compliance with all applicable laws. In case the Corporation is listed on an Exchange the operation of this Plan and the issuance and exercise of all Options and Optioned Shares contemplated by this Plan will also be subject to compliance with all applicable rules and requirements of the Exchange.

12.2 As a condition of participating in the Plan, each Optionee agrees to comply with all applicable law and where relevant the requirements of the Exchange, and to fully cooperate with the Corporation in doing all such things, including executing and delivering all such agreements, undertakings or other documents or furnishing all such information as is reasonably necessary to facilitate compliance with such laws, rules and requirements, including all Withholding Obligations.

12.3 Participation in the Plan is voluntary and does not constitute a condition of employment or continued employment or service. An Optionee shall not have any rights as a shareholder of the Corporation with respect to any of the Optioned Shares underlying any Option until the date of issuance of a certificate for Shares upon the exercise of such Option, in full or in part, and then only with respect to the Shares represented by such certificate or certificates. Without in any way limiting the generality of the foregoing, no adjustment shall be made for dividends or other rights for which the record date is prior to the date such share certificate is issued.

12.4 Nothing in the Plan or any Option shall confer upon an Optionee any right to continue or be re-elected as a director of the Corporation or any right to continue in the employ or engagement of the Corporation or any Subsidiary, or affect in any way the right of the Corporation or any Subsidiary to terminate his or her employment or engagement at any time; nor shall anything in the Plan or any Option be deemed or construed to constitute an agreement, or an expression of intent, on the part of the Corporation or any Subsidiary to extend the employment or engagement of any Optionee beyond the time which he or she would normally be retired pursuant to the provisions of any present or future retirement plan of the Corporation or any Subsidiary or any present or future retirement policy of the Corporation or any Subsidiary, or beyond the time at which he or she would otherwise be retired pursuant to the provisions of any contract of employment with the Corporation or any Subsidiary.

12.5 An Option shall be personal to the Optionee and shall be non-assignable and non-transferable (whether by operation of law or otherwise), except as provided for herein. Upon any attempt to transfer, assign, pledge, hypothecate or otherwise dispose of an Option contrary to the provisions of the Plan, or upon the levy of any attachment or similar process upon an Option, the Option shall, at the election of the Corporation, cease and terminate and be of no further force or effect whatsoever. Notwithstanding the above, if the Optionee is a company that is wholly-owned by an Eligible Person, the Option may be transferred or assigned between the Optionee and the Eligible Person associated with the Optionee.

12.6 The Plan (including any amendment to the Plan), the terms of the issue or grant of any Option under the Plan, the grant and exercise of Options hereunder, and the Corporation's obligation to sell and deliver Optioned Shares upon the exercise of Options, shall be subject to:

(a) all applicable law;

(b) in case the Corporation is listed on an Exchange; the requirements of the Exchange; and

(c) such approvals by any regulatory or governmental agency as may, in the opinion of counsel to the Corporation, be necessary or advisable.

The Corporation shall not be obliged by any provision of the Plan or the grant of any Option hereunder to issue or sell Shares in violation of such laws, rules and regulations or any condition of such approvals.

12.7 The Plan and all matters to which reference is made herein shall be governed by and interpreted in accordance with the laws of the Province of British Columbia and the laws of Canada applicable therein.

June 1, 2018

SCHEDULE "A"

DeepGreen Metals Inc.
STOCK OPTION AGREEMENT

OPTION AGREEMENT made the _____ day of _____, 2018.

B E T W E E N:

DeepGreen Metals Inc., a corporation incorporated under the laws of the Province of British Columbia,

(hereinafter called the "**Corporation**")

- and -

_____
(Name)

_____

_____
(Address)

(hereinafter called the "**Optionee**")

WHEREAS the Corporation has established the Stock Option Plan (the "**Plan**") for Eligible Persons;

AND WHEREAS the Optionee is an "Eligible Person" under the Plan and the board of directors of the Corporation has authorized the granting by the Corporation of an option to the Optionee pursuant to and in accordance with the provisions of the Plan on the terms hereinafter set forth;

NOW THEREFORE THE CORPORATION AND THE OPTIONEE AGREE AS FOLLOWS:

1. The Corporation hereby grants to the Optionee, subject to the terms and conditions set forth in this Agreement and the Plan, options ("**Options**") to purchase that number of common shares ("**Shares**") of the Corporation set forth below, at the exercise price(s) set forth below, which Options will vest and be exercisable as of the vesting date(s) set forth below and expire (to the extent not previously exercised) as of the close of business on the expiry date(s) set forth below:

Number of Shares	Exercise Price	Vesting Date or Vesting Criteria	Expiry Date
●	$ ●	●	●
●	$ ●	●	●
●	$ ●	●	●

2. As of the close of business on the expiry date(s) set forth in Section 1 above, any Options that remain unexercised will expire and be of no further force or effect.

3. The Optionee acknowledges receipt of a copy of the Plan and hereby agrees that the Options are subject to the terms and conditions of the Plan, including all amendments to the Plan required by the Exchange (should the Corporation seek to and/or be listed on the Exchange) or other applicable regulatory authority or otherwise consented to by the Optionee. The Plan contains provisions permitting the termination of the Plan and outstanding Options. Notwithstanding anything contained in this Stock Option Agreement, in the event that the Corporation seeks to list on the Exchange (including without limitation moving from the TSXV to the TSX), and the Exchange requires that the terms of this Stock Option Agreement be amended in order to permit the listing and/or to comply with the rules of the Exchange, the Optionee agrees that this Stock Option Agreement will be amended to the extent necessary to permit the listing on the Exchange and/or to comply with the rules of the Exchange, provided such amendments apply on a non-discriminatory basis.

4. By signing this Agreement, the Optionee acknowledges and agrees that: (i) the Optionee has read and understands the Plan and has been advised to seek independent legal advice with respect to his rights in respect of the Options and agrees to the terms and conditions thereof and of this Stock Option Agreement; (ii) in addition to any resale restrictions under applicable securities laws, all Options and Optioned Shares may be subject to a hold period as required by the applicable Exchange or other regulatory authority; (iii) he or she has not been induced to participate in the Plan by expectation of appointment, employment, or service or continued appointment, employment or service; and (iv) if the Optionee is a Company that is wholly-owned by an Eligible Person, it agrees not to effect or permit any transfer of ownership or option of shares of the Company nor to issue further shares of any class in the Company to any other individual or entity as long as any Options granted to the Optionee remain outstanding, except with the written consent of the Exchange where applicable.

5. In the event that a take-over bid is made for the Shares at any time after the date of this agreement, the Board shall have the power, in its sole discretion, to modify the terms of the Plan and/or the Options, including, for greater certainty, to cause the vesting of all unvested Options or to otherwise assist the Optionees to tender into a take-over bid.

6. The Optionee acknowledges and agrees that the Board may, in its discretion, require as conditions to the grant or exercise of any Option that the Optionee shall have, among other things:

   (a) represented, warranted and agreed in form and substance satisfactory to the Corporation that such Optionee is acquiring and will acquire such Option and the Optioned Shares for such Optionee's own account, and not with a view to or in connection with any distribution or resale, that such Optionee has had access to such information as is necessary to enable such Optionee to evaluate the merits and risks of such investment and that such Optionee is able to bear the economic risk of investing in the Shares, and such other representations, warranties and undertakings as are contained in the Corporation's standard subscription agreement;

   (b) agreed to restrictions on transfer in form and substance satisfactory to the Corporation and to an endorsement on any option agreement or certificate representing the Shares making appropriate reference to such restrictions; and

   (c) agreed to indemnify the Corporation in connection with the foregoing.

7. Time is of the essence of this Agreement.

8. This Agreement shall enure to the benefit of and be binding upon the Corporation, its successors and assigns. Other than as provided for in the Plan, the Options under this option agreement are not transferable or assignable by the Optionee.

9. In the event of any inconsistency between the terms of this Agreement and the terms of the Plan, the terms of the Plan shall govern.

10. This Agreement shall be governed by and construed in accordance with the laws of the Province of British Columbia and shall be treated in all respects as a British Columbia contract.

DeepGreen Metals Inc.

Per: _____

_____ _____

Witness

SCHEDULE 'B'

NOTICE OF EXERCISE OF STOCK OPTIONS

To: **DeepGreen Metals Inc.**

The undersigned Optionee hereby exercises his/her/its option to purchase _____ common shares of DeepGreen Metals Inc. granted _____, _____, at the exercise price (the "**Exercise Price**") of $_____ per share.

Payment in full of the aggregate Exercise Price for the total number of common shares purchased is enclosed.

Date: _____

_____
Signature

_____
Name (*please print*)

_____

_____
Address

Please register my shares as set out above, or as follows:

_____

_____
Address

_____

Please have a copy of my certificate sent to me at:

_____

_____
Address

Exhibit 10.21

AMENDMENT

TO

DEEPGREEN METALS INC.

STOCK OPTION PLAN

In accordance with those certain resolutions adopted by the Board of Directors of DeepGreen Metals Inc. (the "**Corporation**") dated as of April 8, 2021, the Corporation's Stock Option Plan dated as of April 12, 2015 (as amended from time to time) (the "**Plan**") is hereby amended as follows:

WHEREAS, the Board of Directors of the Corporation (the "**Board**") adopted the Plan;

WHEREAS, pursuant to the Plan, the Board may amend the Plan from time to time in such respects as the Board may deem advisable; and

WHEREAS, the Board desires to amend the Plan as set forth herein.

NOW, THEREFORE, the Plan is hereby amended as follows:

1. Section 2.8 of the Plan is hereby amended to delete the definition of "Consultant" and to replace it with the following:

   "2.8 "**Consultant**" means an individual (other than an Employee) or consultant corporation, that is engaged to provide on a *bona fide* basis consulting, technical, management or other services to the Corporation or to any of its Subsidiaries under a written contract between (i) the Corporation or such Subsidiary and (ii) the individual or consultant corporation."

2. Section 2.14 of the Plan is hereby amended to delete the definition of "Employee" and to replace it with the following:

   "2.14 "**Employee**" means any part-time or full-time employee of the Corporation or any Subsidiary of the Corporation."

3. Section 2.16 of the Plan is hereby amended to add the phrase "NASDAQ, the New York Stock Exchange and" immediately prior to the reference to "the TSX Venture Exchange".

4. The following shall be inserted immediately after Section 2.27 of the Plan and immediately prior to Section 2.28 of the Plan:

   "2.27(A) "**Permitted Designee**" means, in respect of an Eligible Person:

   (a) a spouse (common law or otherwise) or child (natural or adopted) of the Eligible Person;

   (b) the estate and heirs and beneficiaries (arising from death) of the Eligible Person and persons identified in Section 2.27(A)(a); or

   (c) a Company the sole shareholders, partners or beneficiaries of which only include the Eligible Person and persons referred to in Sections 2.27(A)(a) and 2.27(A)(b)."

5. Section 5.1 of the Plan is hereby amended to add the following at the end thereof:

"Notwithstanding the foregoing, an Eligible Person to whom Options are granted may request, by written notice to the Corporation, to have such Options issued in the name of a Permitted Designee. The Corporation may, in its sole and absolute discretion, accept or reject such request, provided that if the request is accepted:

(i) the Eligible Person and the Permitted Designee shall execute and deliver to the Corporation an instrument in writing providing such representations, warranties and covenants as the Corporation may require (including satisfying the Corporation that the intended designee is a Permitted Designee);

(ii) the Corporation shall be satisfied, in its sole and absolute discretion, that the Corporation may do so:

(a) in compliance with all applicable laws (including securities laws); and

(b) without imposing any additional financial or other obligations upon the Corporation;

(iii) references in Section 4.2 of the Plan to limits on the number of Options which may be granted to an Optionee shall be read as being the cumulative aggregation of Options granted to an Eligible Person and such Eligible Person's Permitted Designees;

(iv) the provisions of Section 6 of the Plan shall apply to Options held by the Permitted Designee in the event of the termination of employment, consultancy and directorship of the Eligible Person who designated the Permitted Designee (so that corresponding references to the termination of employment, consultancy and directorship of the Optionee shall be read as being references to the termination of employment, consultancy and directorship of the Eligible Person) and, for greater certainty, the Permitted Designee shall be bound by the same provisions, effects and limitations as would have applied if the Eligible Person was the Optionee; and

(v) if the Permitted Designee ceases at any time ceases to qualify as a Permitted Designee of the Eligible Person, then any Option held by such Permitted Designee shall immediately terminate and be of no further force and effect."

6. The foregoing amendments shall be effective as of March 4, 2021 (Dubai time).

7. Capitalized terms used herein shall, unless otherwise defined, have their respective meanings attributed thereto in the Plan.

[*Remainder of page intentionally blank*]

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption "Experts" and to the use of our report dated March 26, 2021, with respect to the consolidated financial statements of DeepGreen Metals Inc. included in the Amendment No.1 to the Registration Statement (Form S-4) of Sustainable Opportunities Acquisition Corp.

/s/ Ernst & Young LLP
Chartered Professional Accountants
Vancouver, Canada
May 26, 2021

Exhibit 23.2

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM'S CONSENT

We consent to the inclusion in this Registration Statement of Sustainable Opportunities Acquisition Corp. (the "Company") on Amendment No. 1 of Form S-4 (File No. 333-255118) of our report dated March 30, 2021, except for the effects of the restatement disclosed in Note 2 as to which the date is May 24, 2021, which includes an explanatory paragraph as to the Company's ability to continue as a going concern, with respect to our audit of the financial statements of Sustainable Opportunities Acquisition Corp. as of December 31, 2020 and 2019 and for the year ended December 31, 2020 and the period from December 18, 2019 (inception) through December 31, 2019, which report appears in the proxy statement/prospectus, which is part of this Registration Statement. We also consent to the reference to our Firm under the heading "Experts" in such proxy statement/ prospectus.

/s/ Marcum LLP

Marcum LLP
New York, NY
May 26, 2021

Exhibit 23.6

AMC Consultants Pty Ltd
179 Turbot Street, Brisbane
Queensland, 4060, Australia

CONSENT OF THIRD-PARTY QUALIFIED PERSON

AMC Consultants Pty Ltd ("AMC"), in connection with the Registration Statement and Proxy Statement/Prospectus and any amendments or supplements and/or exhibits thereto (collectively, the Form S-4), consent to:

- the filing and use of the technical report summary titled "Technical Report Summary-- Initial Assessment of the NORI Property, Clarion-Clipperton Zone, for Deep Green Metals Inc." (the "NORI Technical Report"), with an effective date of March 17, 2021, as an exhibit to and referenced in the Form S-4;
- the use of and references to our name, including our status as an expert or "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the Securities and Exchange Commission), in connection with the Form S-4 and any such NORI Technical Report; and
- the information derived, summarized, quoted or referenced from the NORI Technical Report, or portions thereof, that was prepared by us, that we supervised the preparation of and/or that was reviewed and approved by us, that is included or incorporated by reference in the Form S-4.

AMC is responsible for authoring, and this consent pertains to, the following Sections of the NORI Technical Report:

- Section 1: Summary
- Section 2: Introduction
- Section 3: Property description and location
- Section 4: Accessibility, climate, local resources, infrastructure, and physiography
- Section 5: History
- Section 8.2: Sample preparation and assaying
- Section 8.3: Quality assurance and quality control procedures 2018
- Section 8.4: Quality assurance and quality control procedures 2019
- Section 8.5: Moisture Content
- Section 9: Data verification
- Section 11: Mineral Resource estimates
- Section 12: Mineral Reserve estimates
- Section 13.3: Geotechnical considerations
- Section 13.7: Life of Mine nodule production
- Section 14.2: Project Zero
- Section 15.1: On-shore infrastructure
- Section 16: Market studies
- Section 17: Environmental studies, permitting and social or community impact
- Section 18 (except 18.3.1, 18.3.2, 18.6.1, 18.6.6): Capital and operating costs
- Section 19: Economic analysis
- Section 20: Adjacent properties
- Section 21: Other relevant data and information
- Section 22: Interpretation and conclusions
- Section 23: Recommendations
- Section 24: References
- Section 25: Reliance on information provided by the registrant

Dated this May 26, 2021

/s/ Robert James Chesher
Robert James Chesher
General Manager, Brisbane Office
Signature of Authorized Person for
AMC Consultants Pty Ltd, a Qualified Third-Party Firm

Exhibit 23.7

AMC Consultants Pty Ltd
179 Turbot Street, Brisbane
Queensland, 4060, Australia

CONSENT OF THIRD-PARTY QUALIFIED PERSON

AMC Consultants Pty Ltd ("AMC"), in connection with the Registration Statement and Proxy Statement/Prospectus and any amendments or supplements and/or exhibits thereto (collectively, the Form S-4), consent to:

- the filing and use of the technical report summary titled "Technical Report Summary--Initial Assessment of the TOML Mineral Resource, Clarion-Clipperton Zone, Pacific Ocean, for Deep Green Metals Inc." (the "TOML Technical Report"), with an effective date of March 17, 2021, as an exhibit to and referenced in the Form S-4;
- the use of and references to our name, including our status as an expert or "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the Securities and Exchange Commission), in connection with the Form S-4 and any such TOML Technical Report; and
- the information derived, summarized, quoted or referenced from the TOML Technical Report, or portions thereof, that was prepared by us, that we supervised the preparation of and/or that was reviewed and approved by us, that is included or incorporated by reference in the Form S-4.

AMC is responsible for authoring, and this consent pertains to, the following Sections of the TOML Technical Report:

- Section 1: Executive Summary
- Section 2: Introduction
- Section 3: Property Description and Location
- Section 8: Sample preparation, analyses and security
- Section 9: Data verification
- Section 11.1 – 11.8: Mineral Resources
- Section 11.9.1: Geological setting and mineralisation
- Section 11.9.2: Exploration methods
- Section 11.9.3: Sample preparation analysis and security
- Section 11.9.4: Mineral Resources
- Section 11.9.8: Market studies
- Section 11.9.9: Environmental studies, permitting and social or community impact
- Section 12: Mineral Reserve Estimates
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Dated this May 26, 2021

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Technical Report Summary

Initial Assessment of the NORI Property, Clarion-Clipperton Zone

Deep Green Metals Inc.

In accordance with the requirements of SEC Regulation S-K (subpart 1300)

AMC Project 321012
17 March 2021

Unearth a smarter way

1 Summary

1.1 Introduction

A very large resource of polymetallic nodules, containing nickel, manganese, cobalt, and copper is located on the seafloor in the Clarion-Clipperton Zone (CCZ) of the north-east Pacific Ocean. DeepGreen Metals Inc. (DeepGreen) has identified the potential to recover metals from polymetallic nodules to support increasing demand from battery and electric vehicle production. Unlike most mining processes, the proposed mineral processing flowsheet seeks to make by-products rather than substantial waste streams and is not expected to require tailings ponds or other large-scale waste storage on-site.

Nauru Ocean Resources Inc (NORI), a wholly-owned subsidiary of DeepGreen, holds exploration rights to four areas (NORI Area A, B, C, and D, the Property) in the CCZ that were granted by the International Seabed Authority (ISA) in 2011. NORI is sponsored to carry out its mineral exploration activities in the Property by the Republic of Nauru, pursuant to a certificate of sponsorship signed by the Government of Nauru on 11 April 2011. DeepGreen commissioned AMC Consultants Pty Ltd (AMC) to undertake an Initial Assessment (IA) of the Mineral Resource contained in NORI Area D (the Project) and compile a Technical Report Summary compliant with SEC Regulation S-K (subpart 1300).

Four consortia of off-shore development companies demonstrated the technical feasibility of collecting, lifting, and converting nodules into metals in the 1970s, but development of the industry was frustrated by the absence of regulation and a governing body. In 1994 the United Nations established the ISA pursuant to the United Nations Convention on the Law of the Sea (UNCLOS). The ISA governs the development of seabed resources in the territories beyond the exclusive economic zones governed by coastal states. This international territory is known as the Area. The ISA is in the process of finalising the regulations for development of seabed resources from the CCZ and other resources in the Area. The ISA had declared a target of 2020 to have the regulations approved but the COVID-19 pandemic disrupted the ISA program.

A phased development is outlined for NORI Area D. Offshore collection systems, comprising collector vehicles on the seafloor, a riser and lift system (RALS), and a production support vessel would collect polymetallic nodules. The nodules would be transferred to transport vessels and shipped to on-shore processing facilities where established processing technology would be used to produce copper cathode, nickel sulphate and cobalt sulphate suitable for Li Ion battery cathode feedstock, nickel-copper-cobalt alloy, manganese silicate, and ammonium sulphate.

A drillship, the Hidden Gem, will be converted to undertake a pre-production Collector Test in which a collector vehicle, RALS and other systems will be tested. The first phase of commercial production (Project Zero) would then commence after the upgrading of the Hidden Gem to produce a production support vessel that can produce up to 1.3 Mtpa (wet) of nodules. The nodules would be processed through existing third-party facilities on a tolling basis. In Project One, production will be expanded with an additional converted drillship (Drill Ship 2), a second upgrade to the Hidden Gem, and construction of a bespoke production support vessel (Collector Ship 1). Ultimately, the fleet of three production support vessels, each with a dedicated seafloor collection system, would produce an average of ~12.5 Mtpa of wet nodules during steady state production. In Project One, the majority of nodules would be processed at a new facility to be constructed by NORI, with the balance of production going to toll treatment.

This phased approach to development allows for management of risk and for progressive improvement of engineering and operating systems. It will also enable NORI to adopt an adaptive management approach to environmental management.

The IA indicates a positive economic outcome. Undiscounted post-tax net cash flow of US$30.6 billion is expected. An internal rate of return of 27% has been modelled. Discounted cash flow analysis of unleveraged real cash flows, discounting at 9% per annum, indicates a current project net present value of US$6.8 billion. The analysis indicates that the Project will generate approximately US$7.2 billion in undiscounted royalties payable to the ISA and Nauru and US$9.1 billion in on-shore corporate tax payable to the host nation of the process plant.

An IA is a conceptual study of the potential viability of Mineral Resources. This IA indicates that development of the NORI Area D Mineral Resource is potentially technically and economically viable, however, due to the preliminary nature of project planning and design, and the untested nature of the specific seafloor production systems at a commercial scale, economic viability has not yet been demonstrated.

1.2 Location

The NORI Property is located within the CCZ of the northeast Pacific Ocean (Figure 3.1). The CCZ is located in international waters between Hawaii and Mexico. The western end of the CCZ is approximately 1,000 km south of the Hawaiian island group. From here, the CCZ extends over 4,500 km east-northeast, in an approximately 750 km wide trend, with the eastern limits approximately 2,000 km west of southern Mexico. The region is well-located to ship nodules to the American continent or across the Pacific to Asian markets.

The NORI Property comprises four separate blocks (A, B, C and D) in the CCZ with a combined area of 74,830 km^2. These areas were previously explored by three Pioneer Investors. The NORI Area D Project covers 25,160 km^2 and is the easternmost of the four NORI exploration areas. Its centre point is at latitude 10° 29’ N and longitude 116° 57’ W, approximately 850 km due west of the nearest land—the uninhabited Clipperton Island.

1.3 The ISA and the NORI tenements

The international seabed area (otherwise known as the Area) is defined as the seabed and subsoil beyond the limits of national jurisdiction (UNCLOS Article 1). The principal policy documents governing the Area include:

- The United Nations Convention on the Law of the Sea, of 10 December 1982 (The Convention).

- The 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (the 1994 implementation Agreement).

Part XI of the Convention and the 1994 Implementation Agreement deals with mineral exploration and exploitation in the Area, providing a framework for entities to obtain legal title to areas of the seafloor from the ISA for the purpose of exploration and eventually exploitation of resources.

The Convention entered into force on 16 November 1994. As of 20 August 2020, the Convention had been signed by 167 states (countries) and the European Union. The United States of America is currently not a party to the Convention.

The ISA is an autonomous international organisation established under the Convention and the 1994 Implementation Agreement to organise and control activities in the Area, particularly with a view to administering and regulating the development of the resources of the Area in accordance with the legal regime established in the Convention and the 1994 Implementation Agreement.

All rules, regulations, and procedures issued by the ISA to regulate prospecting, exploration, and exploitation of marine minerals in the Area are issued within a general legal framework established by the Convention and the 1994 Implementation Agreement.

To date, the ISA has issued regulations on prospecting and exploration for polymetallic nodules in the Area. In March 2019, the Council of the ISA released the advance and unedited text (English only) of the Draft Regulations on Exploitation of Mineral Resources in the Area (ISBA/25/C/WP.1) (ISA, 2019).

In July 2011, NORI was granted a polymetallic nodule exploration contract by the ISA. The contract was granted pursuant to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted 13 July 2000) and formalises an exploration area, a term of 15 years for the contract, and a program of activities for the first five-year period (NORI Exploration Contract). The contract also formalises the rights of NORI around tenure. Pursuant to the Regulations, NORI has the priority right to apply for an exploitation contract to exploit polymetallic nodules in the same area (Regulation 24(2)).

The NORI Exploration Contract may be extended for periods of five years at a time beyond the initial 15-year period, provided NORI has made efforts in good faith to comply with the requirements of the plan of work.

In 2020, NORI acquired the polymetallic nodule exploration contract awarded by the ISA to Tonga Off-shore Mining Limited (TOML). TOML Area F is immediately west of NORI Area D.

1.4 Geology and Mineral Resources

Seafloor polymetallic nodules occur in all oceans but the CCZ hosts a relatively high abundance of nodules. The CCZ seafloor forms part of the Abyssal Plains, which are the largest physiographic province on Earth.

The average depth of the seafloor in the Project Area is 3,800 to 4,200 m. Overall, the seafloor slopes at approximately 0.57˚ (1 m per km) but the Abyssal Plains are traversed by ridges, with amplitude of 50 to 300 m (maximum 1,000 m) and wavelength of 1 to 10 km. The Abyssal Plains are punctuated by extinct volcanoes rising 500 to 2,000 m above the seafloor.

Seafloor polymetallic nodules rest on the seafloor at the seawater - sediment interface. They are composed of nuclei and concentric layers of manganese and iron hydroxides and are formed by precipitation of metals from the surrounding seawater and sediment pore waters. Nickel, cobalt and copper are also precipitated and occur within the structure of the manganese and iron minerals.

Nodules are abundant in abyssal areas with oxygenated bottom waters and low sedimentation rates (less than 10 cm per thousand years). Nodules generally range from about 1 to 12 cm in their longest dimension. Nodules of 1 to 5 cm are typically the most common in NORI Area D, where they have been classified as Type 1 nodules.

The specific conditions of the CCZ (water depth, latitude, and seafloor sediment type) are considered to be the key controls for the formation of polymetallic nodules.

Information on the mineralisation within NORI Area D comprises a combination of sampling undertaken by NORI as well as free-fall grab sampler (FFG) and box core sampler (BC) data supplied by the ISA at the time of the NORI application and also supplied by the ISA to NORI in 2012. Additional regional data, assembled by the ISA as part of its Geological Model Project during 2008 to 2010 (ISA 2010), are available. The data provide significant coverage over NORI Area D and indicate a high abundance of nodules in this region, as has been confirmed by NORI's exploration.

NORI completed off-shore exploration campaigns in 2012, 2013, 2018, 2019 and 2020. During these campaigns a variety of data was collected including:

- Bathymetric mapping of the whole of NORI Area D using a hull-mounted Kongsberg Simrad EM120 12 kHz, full-ocean depth multibeam echo-sounding system (MBES). This system also provided backscatter data with which seafloor characteristics could be interpreted.
- Detailed seafloor survey work with an autonomous underwater vehicle (AUV), utilising an MBES, Side Scan Sonar (SSS), Sub-Bottom Profiler (SBP), and camera payload.
- A total of 252 box core samples collected using a 0.75 m^2 box corer, mainly on a 10 km by 10 km square grid.

The nodules in the box cores were collected, and their characteristics measured and recorded in detail. Samples of nodules were collected in duplicate and assayed at two reputable, well-qualified laboratories: ALS and Bureau Veritas. Certified reference material, and blank samples were inserted to provide additional levels of quality control. No significant issues were identified with the assay results.

The backscatter data and the sidescan sonar and seafloor photography indicate strong continuity of nodule abundance across NORI Area D. There is a clear relationship between nodule long axis length and nodule weight and therefore it is possible to estimate nodule abundance from photographs. Several estimation techniques were tested, and methodologies were developed that are suitable for closely packed (Type 1) and less closely packed (Type 2 and 3) nodules.

Mineral Resources were estimated using a two-dimensional block model. Estimates of nodule abundance and nickel, manganese, cobalt, and copper grades were performed using kriging. A variety of methods was used to validate the estimates, including conditional simulation. The estimates of nodule abundance were used to calculate the tonnage of the Mineral Resources.

The bathymetric mapping enabled the interpretation of parts of seafloor that are possibly too steep for recovery of nodules using the systems considered in this IA. Seafloor areas with slopes steeper than 6° were excised from the 2020 Mineral Resource estimate.

The Mineral Resource was classified on the basis of the quality and uncertainty of the sample data and sample spacing, in accordance with SEC Regulation S-K (subpart 1300).

The Measured Mineral Resource was assigned to the area within NORI Area D where box-core sampling was conducted on a nominal 7 km by 7 km spacing and infilled with estimates of nodule abundance from seafloor photography to a spacing of 3.5 km by 3.5 km.

The Indicated Mineral Resource was assigned to the area within NORI Area D where box-core sampling was conducted on a nominal spacing of 7 km by 7 km or 10 km by 10 km but without additional photo-estimates of nodule abundance.

The Inferred Mineral Resource was assigned to the areas of abyssal plain in the southeast corner of NORI Area D that are largely unsampled. The volcanic high in the southeast corner was excluded from the mineral resource estimate due to the high level of uncertainty about nodule abundance and grades in this domain.

The new Mineral Resource estimate for NORI Area D, with an effective date of 31 December 2020, is reported in Table 1.1 at a 4 kg/m^2 abundance cut-off. This cut-off is derived from the estimates of costs and revenues presented in this Initial Assessment.

Whilst the IA focusses on the development of mining operations in NORI Area D, NORI holds another three areas in the CCZ under the same title. These Areas (NORI Area A, B and C) are estimated to contain Inferred Mineral Resources of 510 Mt (wet) at 1.28% Ni, 0.21% Co, 1.04% Cu, 28.3% Mn, at an average abundance of 11 kg (wet)/m^2 at a 4 kg/m^2 abundance cut-off (Golder, 2013) (effective date of 31 December 2020). The polymetallic nodule mineralisation in Areas A, B and C has similar characteristics to NORI Area D and it is reasonable to assume that the technology proposed in the IA would be suitable for development of these additional areas.

Table 1.1 NORI 2020 Mineral Resource estimate, in situ, for NORI Area D at 4 kg/m^2 abundance cut-off

NORI Area	Category	Tonnes (Mt (wet))	Abundance (wet kg/m^2)	Nickel (%)	Copper (%)	Cobalt (%)	Manganese (%)	Silicon (%)
D	Measured	4	18.6	1.42	1.16	0.13	32.2	5.13
D	Indicated	341	17.1	1.40	1.14	0.14	31.2	5.46
D	Measured + Indicated	345	17.1	1.40	1.14	0.14	31.2	5.46
D	Inferred	11	15.6	1.38	1.14	0.12	31.0	5.50

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

1.5 Development plan

NORI proposes to implement the project in multiple phases that will allow the seafloor mining systems to be tested and then nodule production to be gradually ramped up. The phased approach will facilitate de-risking of the project for relatively low initial capital investment. Additionally, this phased development will allow for an adaptive approach to environmental management providing learning at small-scale which would be applied as the development increases scale.

The proposed seafloor production development phases are as follows:

- The Collector Test is designed to perform proof of concept for the methods of collecting and lifting the nodules while acquiring sufficient data to design a commercial system. Nodules collected during the test would be stored on the Hidden Gem and brought to shore for use in large scale process pilot testing. The Collector Test would use a converted sixth generation drillship, the Hidden Gem. The test would not demonstrate the transhipment of nodules to a shore-based facility.
- Project Zero would be an extension of the Collector Test using an upgrade of the Hidden Gem to produce a sufficient and continuous quantity of nodules to support a relatively small commercial operation of about 1.3 Mtpa (wet) nodules delivered to a shore-based facility. This operation would demonstrate a more continuous mining operation at a larger scale than the Collector test and would demonstrate the transhipment of nodules to a processing facility. It would also allow for the implementation and testing of adaptive management systems to ensure environmental compliance.
- Project One would increase production in a further three steps: 1) introduction of a second converted drillship (Drill Ship 2) with a capacity of up to 3.6 Mtpa (wet), 2) a further upgrade of the Hidden Gem to up to 3.6 Mtpa (wet) and 3) construction of a new purpose-built production support vessel (Collector Ship 1) with capacity of up to 8.2 Mtpa (wet). Project One would benefit from lessons learned on the Collector Test and Project Zero.

The processing of the polymetallic nodules would also be ramped up in phases:

- In Project Zero, NORI proposes to toll treat polymetallic nodules at existing RKEF smelters, utilizing excess industry capacity. NORI advises there is significant interest from many parties in China to utilise RKEF plants which may become stranded as a result of the Indonesian government nickel laterite ore export ban restricting supply of the nickel laterite feedstock that they currently utilise. These RKEF plants were originally built to convert nickel laterite to nickel pig iron and could be converted to smelt polymetallic nodules.
- In Project One, a purpose-built process plant would be constructed, including pyrometallurgical and hydrometallurgical circuits. Nodule production would be increased in phases by treatment in this new plant.

1.6 Mining concept

The main items of off-shore infrastructure are the nodule collector vehicles, the riser, and three production support vessels (PSV): Hidden Gem, Drill Ship 2 and Collector Ship 1. Collector Ship 1 will be supported by a collector support vessel.

The nodules will be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection. The collectors will be remotely controlled and supplied with electric power via umbilical cables from the PSV. The collectors will traverse the seabed at a speed of approximately 0.5 m/s. Suction dredge heads on each collector will recover a dilute slurry of nodules, sediment, and water from the seafloor. Each collector will yield about 254 t/hr (dry) nodules to the process plant. A hopper on each vehicle will separate sediment and excess water, which will pass out of the hopper overflow, from the nodules, which will be pumped as a higher concentration slurry via flexible hoses to a riser.

The riser is a steel pipe through which nodules will be transferred to the surface by means of an airlift. The riser will consist of three main sections. The lower section will carry the two-phase slurry of nodules and water from the collectors to the airlift injection point. The mid-section will carry a three-phase mixture of slurry and air. This section will also include two auxiliary pipes: one to carry the compressed air for the airlift system, and one to return water from dewatering of the slurry to its subsea discharge point. The upper section of riser will have a larger diameter to account for the expansion of air in the airlift.

The airlift works by lowering the average density of the slurry inside the riser to a level lower than seawater. The difference between the hydrostatic pressure of the seawater at depth and the pressure caused by the weight of the low-density three-phase slurry column inside the riser forces the slurry column to rise. The energy to achieve the lift will be supplied by compressors housed on the PSV, which will be capable of generating very high air pressures—up to 15 MPa.

The PSVs will each support a RALS and its handling equipment, and will house the airlift compressors, collector vehicle control stations, and material handling equipment. All power for off-shore equipment, including the nodule collecting vehicles, will be generated on the PSVs. The PSVs will be equipped with controllable thrusters and will be capable of dynamic positioning (DP), which will allow the vessels and risers to track the collectors. The Collector Ship 1 PSV will be similar in size to an Aframax or New Panamax class of tanker, displacing approximately 103,000 t, and housing a crew of around 120 personnel. Nodules will be discharged from the RALS to the PSVs, where they will be dewatered and temporarily stored or transferred directly to a transport vessel.

A separate collector support vessel will remain at sea to support Collector Ship 1. It will be configured as a subsea support platform, as commonly used in oil industry, with a displacement of around 17,250 t. The function of the collector support vessel will be to facilitate collector maintenance and repair.

This IA assumes transportation of nodules will be by chartered vessels, with deadweight capacities of 35,000 to 100,000 tonnes. The vessels will require dynamic positioning capability to enable them to be loaded at sea alongside the PSV. Hydraulic offloading of the nodules from the PSV to the transport ships is assumed in this IA, but future studies will confirm the offloading mechanism.

1.7 Mineral processing and metallurgical testing

A combined pyro-metallurgical and hydro-metallurgical flowsheet was evaluated for these IA. Similar flowsheets were investigated at various times over the last several decades. NORI has undertaken bench-scale test-work and is in the process of completing pilot-scale testing of the proposed flowsheet. This work has confirmed or improved the flowsheet that was initially developed from extensive information available in the literature.

Pyrometallurgical processing of nodules has been extensively studied from the early 1970s until the present day and appears to be the preferred process for most of the other currently active nodule processing research groups. Many groups including: Kennecott; Inco; Cuban / Bulgarian; German; Indian; Japanese; and Korean have studied pyrometallurgical processing of nodules at a laboratory scale. The nodule samples for these tests were collected from their respective license areas in the CCZ. The nodules used in each of the studies have similar compositions but there are subtle variations that can have significant implications for pyrometallurgical processing. Of particular importance is the ratio of $MnO:SiO_2$ in the nodules as this impacts the choice of process operating parameters for the electric furnace smelting operation.

For Project Zero, NORI proposes to toll treat polymetallic nodules at existing RKEF smelters. During Project One, NORI proposes the progressive construction and expansion of a new pyrometallurgical and hydrometallurgical process plant for the recovery of nickel, manganese, cobalt, and copper from polymetallic nodules. This will allow for the proportion of toll treatment to be reduced.

Four rotary kiln and electric furnaces lines (RKEF) and two hydrometallurgical refineries would be required to meet the production demand for the life of the project.

The pyrometallurgical front end of the plant will use RKEF lines that calcine and smelt the nodules to form an alloy. The alloy would then be sulphidised to form a matte and then partially converted in a Peirce-Smith converter operation to remove iron. The matte from the sulphidation step would then be sent to the hydrometallurgical refinery. The pyrometallurgical process is similar to that successfully used to process some nickel laterite ores.

The hydrometallurgical refinery concept is based on a sulphuric acid leach flowsheet. A two-stage leach would be used to produce copper cathode and a pregnant leach solution rich in nickel and cobalt, while low in copper. Further processing of the pregnant leach solution is based on mixed-sulphide precipitate processing flowsheets employing solvent extraction. The final production of battery-grade nickel and cobalt sulphates would use crystallisation.

The pyrometallurgical process generates a manganese silicate stream that can be sold to the manganese industry and small converter slag stream that can be sold for industrial applications. No value has been ascribed to converter slag in this IA. The hydrometallurgical plant produces an ammonium sulphate by-product for sale to the fertiliser industry. Thus, together with the ability to recycle other hydrometallurgical side-streams to the pyrometallurgical process, the flowsheet has neither tailings ponds nor permanent slag repositories and does not generate substantial waste streams.

The average targeted processing rate for the new processing plant at full capacity is 6.4 Mtpa of nodules (dry basis). The location and host country of the processing operation has not yet been determined. Engineering design has not yet been undertaken.

Expected metallurgical recoveries are summarized in Table 1.2.

Table 1.2 Metallurgical recoveries

Process Step	**Nickel Recovery (%)**	**Cobalt Recovery (%)**	**Copper Recovery (%)**
Final matte	94.6%	77.4%	86.5%
Hydrometallurgical products before recycle	98.9%	98.0%	96.2%
Recycled residue	94.6%	77.4%	86.5%
Overall recovery	94.6%	77.2%	86.2%

In addition to the above base metals, 98.9% of the manganese contained in the feed will be recovered to the manganese silicate product, containing 52.6% MnO. Approximately 7.3 Mt of manganese silicate will be produced per annum (from steady state operation from 2030 onwards).

1.8 Market studies

CRU International Limited (CRU) was commissioned by NORI to provide market overviews for the four main products from the NORI Area D Project: nickel sulphate ($NiSO_4$), cobalt sulphate ($CoSO_4$), copper cathode, and a manganese product (CRU, 2020).

CRU expects $NiSO_4$ and $CoSO_4$ markets to undergo extreme growth from a relatively small current level of 181 kt nickel in sulphate and 35 kt of cobalt in sulphate in 2019, with markets to increase to 138 and 178 times their 2018 sizes respectively to 1.6 Mt nickel in sulphate and 500 kt cobalt in sulphate by 2035, with much of this growth occurring post-2025. Electric vehicle production is the driver of this forecast growth.

Copper and manganese markets are forecast to grow by 25% and 20% of their 2020 sizes by 2035 respectively. Copper and manganese demand will benefit from electric vehicle penetration, however the primary driver of growth for manganese ore will be steelmaking, and a variety of end use applications generally related to economic health for copper.

CRU expects copper and $NiSO_4$ prices to rise in real terms by 2035, while manganese and $CoSO_4$ prices are forecast to remain flat, due to current prices being at or near a high point in the cycle, recent fall in prices, and expected modest growth in the global steel industry after the COVID 19 epidemic. The long-term cost of production is expected to rise for both copper and $NiSO_4$, helping to support prices.

1.9 Environmental studies, permitting, community, or social impact

Historically, a significant amount of technical work has been undertaken within the CCZ by the Contractors and a significant body of information has been acquired during the past 40 years on the likely environmental impacts of collecting nodules from the sea floor.

NORI's off-shore exploration campaigns have included sampling to support environmental studies, collection of high-resolution imagery and environmental baseline studies. A number of future campaigns are planned to collect data on ocean currents and water quality to assist plume modelling, environmental baseline studies, box core and multicorer sampling focussed on benthic ecology and sediment characteristics.

NORI has commenced the ESIA process in support of an application for an exploitation license for the commercial mining of deep-sea polymetallic nodules. A comprehensive program of metocean and biological data acquisition is in progress to characterize the baseline conditions at a designated Collector Test site and control sites in the mining lease area.

NORI intends to manage the Project under the governance of an Environmental Management System (EMS), which is to be developed in accordance with the international EMS standard, ISO 14001:2004. The EMS will provide the overall framework for the environmental management and monitoring plans that will be required.

An Environmental Monitoring Plan (EMP) will be required. The plan will specify the objectives and purpose of all monitoring requirements, the components to be monitored, frequency of monitoring, methods of monitoring, analysis required in each monitoring component, monitoring data management and reporting. The plan will be submitted to the ISA as part of the exploitation contract application. This plan will involve an ecosystem approach incorporating an adaptive management system.

The social impacts of the off-shore operation are expected to be positive. The CCZ is uninhabited by people, and there are no landowners associated with the NORI Area D nodule project. No significant commercial fishing is carried out in the area. The Project will provide a source of revenue to the sponsor country, Nauru, and to the ISA.

The on-shore environmental and social impacts have not yet been assessed because the process plant has not been designed in detail, and the location and host country (and hence regulatory regime) not confirmed. The planned metallurgical process will not generate solid waste products, and the deleterious elements (for example, cadmium and arsenic) content of the nodules is very low, indicating that with careful management the environmental impacts of the processing operation could be very low.

1.10 Conceptual production schedule

AMC cautions that the estimates in the production case and economic analysis are preliminary and further studies and engineering design are required before technical feasibility and economic viability can be demonstrated.

The production schedule is shown in Table 1.3.

Table 1.3 Production summary

Section	Units	Total
Nodule tonnage	Mt (wet)	254
Abundance	kg/m^2	16.9
Ni Grade	%	1.39
Cu Grade	%	1.14
Co Grade	%	0.14
Mn Grade	%	31.0
Nickel recovered to Ni Sulphate	kt	2,593
Copper cathode produced	kt	1,936
Cobalt recovered to Co sulphate	kt	206
Manganese silica produced	kt	60,398
Ammonium sulphate produced	kt	7,677
Alloy product produced	kt	377
Matte product produced	kt	688

1.11 Capital cost

The capital cost estimates for the Project are summarised in Table 1.4. Pre-project items include data gathering and studies that will occur prior to construction. Off-shore project costs include the procurement and integration of the PSVs, the collector support vessel, the fabrication of the collectors, and the RALS. On-shore project costs consist principally of the construction of the minerals processing pyrometallurgical plant and hydrometallurgical refinery. Sustaining costs are for both on-shore and off-shore assets, and closure costs are principally for rehabilitation of the on-shore minerals processing site.

Table 1.4 Capital cost estimates

Section	Cost estimate (US$ million)
Pre-project costs	237
Project costs	
Off-shore project costs	
Project Zero	204
Project One	2,244
Total	2,448
On-shore project costs	
Project One	4,786
Total	4,786
Total project costs	7,234
Sustaining capital costs (on-shore and off-shore)	2,637
Closure costs	500
Total	10,607

1.12 Operating cost

Operating costs have been estimated at US$1.8 billion per annum during steady state production (from 2030 onwards). Expenditure of a total of $37.5 billion over the life of the project on operating costs is expected. On-shore processing is the most significant operating cost.

Table 1.5 Average operating cost estimates during steady state operation (from 2030 onwards)

Section	Average Operating Cost over Life of Mine (US$ million pa)	Average Unit Cost (US$/t - wet tonne nodules recovered)	Average Unit Cost (US$/t - dry tonne processed)
Off-shore	$240.74	$19.31	$25.40
Shipping	$254.37	$20.40	$26.84
On-shore	$1,286.19	$103.14	$135.71
Other	$25.00	$2.00	$2.64
Total	$1,806.31	$144.85	$190.59

1.13 Initial Assessment

The IA used product prices forecast by CRU (CRU, 2020). The averages of the forecast prices used (from 2024 onwards) are listed in Table 1.6.

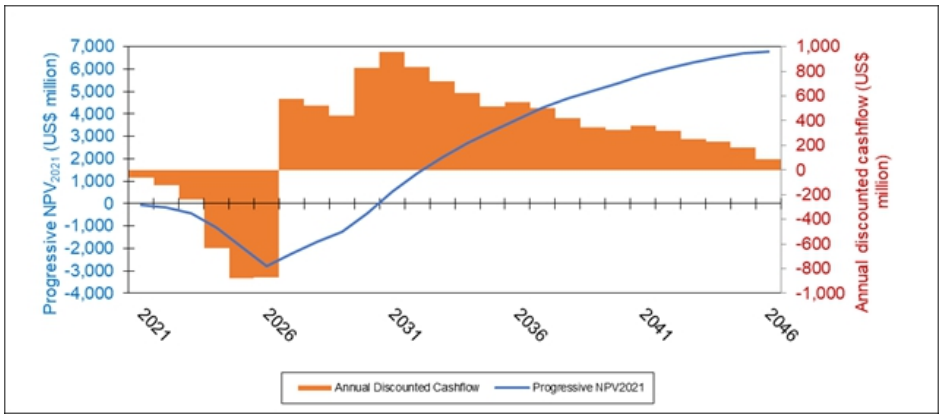
Table 1.6 Average product prices assumed in IA

Parameter	Unit	Value
Ni metal	US$/t	$16,106
Ni contained Ni sulphate	US$/t	$17,711
Mn contained in SiMn product	US$/dry metric tonne unit	$4.53
Cu metal	US$/t	$6,787
Co metal	US$/t	$46,416
Co contained in Co sulphate	US$/t	$56,991
Ammonium sulphate	US$/t	$90

Note: Manganese ores are priced in dmtu (dry metric tonne units). A unit is 10 kg, or 1/100th of a tonne. For example, a tonne of material grading 45% Mn priced at US$4.00/dmtu would be worth US$180/t.

The IA indicates a positive economic outcome. Undiscounted post-tax net cash flow of US$30.6 billion is expected. An internal rate of return of 27% has been estimated from the financial model. Discounted cash flow analysis of unleveraged real cash flows, discounting at 9% per annum, indicates a pre-tax project net present value (NPV) of US$11.2 billion and a post-tax project NPV of US$6.8 billion. The discounted cash flows and progressive NPVs are shown in Figure 1.1. Excluding the inferred mineral resources from the economic analysis, the post-tax project NPV is estimated at $6.7 billion, which is not a significant difference from the economic analysis that includes the inferred mineral resources.

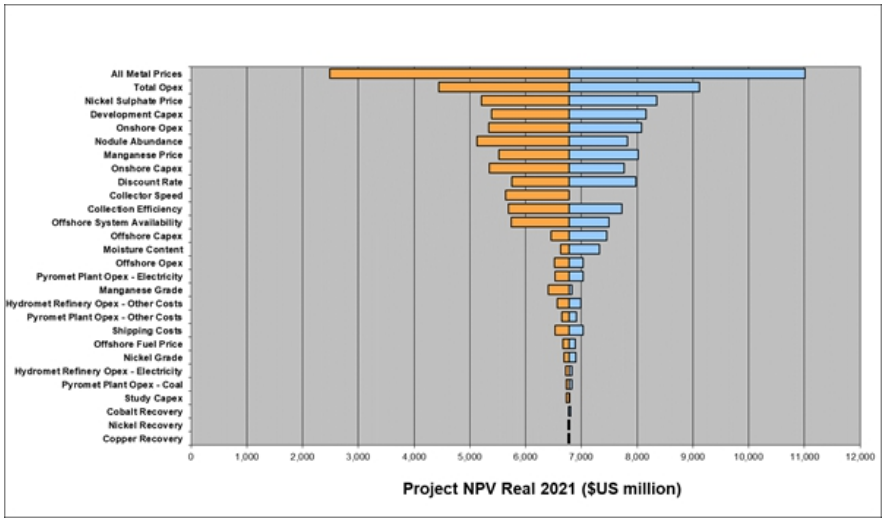
Figure 1.1 Project NPV2021 and discounted cash flow



The date of the investment decision is expected to be 30 June 2023. NORI expects to spend $237 million on pre-project activities between 2021 and 2024. The future value of the project on 30 June 2023 (after the pre-project expenditure is sunk and time has elapsed) will be
US$8.6 billion and the IRR from that point will be 29%.

The sensitivity of project economics to changes in the main variables was tested by selecting high and low values that represent a likely range of potential operating conditions. The variables with the biggest negative impact on NPV are all metal prices, total OPEX, collector speed, nickel sulphate price and development capex. In general, revenue drivers have the biggest impact, followed by OPEX variables and then CAPEX variables (Figure 1.2).

Figure 1.2 Tornado diagram of NPV sensitivity to variables



The Qualified Persons caution that this IA is preliminary in nature, and that further planning, engineering studies, design, cost estimation and seafloor tests are required before Mineral Resources can be converted to Mineral Reserves. There is no certainty that the proposals and results presented in this IA will be realized. A prefeasibility study has not yet been undertaken. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

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Distribution list

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List of acronyms

AAS	Atomic absorption spectroscopy
ALS	ALS Laboratory Group
AMC	AMC Consultants Pty Ltd
AMR	Arbeitsgemeinschaft Meerestechnisch Rohstoffe
APEI	Area of Particular Environmental Interest
AUV	Autonomous underwater vehicle
BC	Box core
BGR	German Federal Institute for Geosciences and Natural Resources
BV	Bureau Veritas laboratory
CCZ	Clarion-Clipperton Zone
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CV	Coefficient of variation
The Convention	United Nations Convention on the Law of the Sea 1982
DeepGreen	DeepGreen Metals Inc.
DGE	DeepGreen Engineering Pte. Ltd.
DISCOL	Disturbance and Recolonisation Experiment
DOMES	Deep Ocean Mining Environmental Study
DP	Dynamic positioning
EF	Electric furnace
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EW	Electro-winning
FFG	Free-fall grab samplers
FV	Finishing vessel
Glencore	Glencore International Ag
Golder	Golder Associates Pty Ltd.
ICP-MS	Inductively coupled plasma mass spectrometry
ID	Inside diameter
IDW	Inverse Distance Weighting – an estimation method utilising distance-weighted local averages
IFREMER	lnstitut Français de Recherche pour l'Exploitation de la Mer (French Research Institute for Exploitation of the Sea)
Inco	International Nickel Corporation
IOM	lnteroceanmetal Joint Organisation
IRR	Internal rate of return
ISA	International Seabed Authority
IX	Ion exchange
LED	Light-emitting diode
LME	London Metal Exchange
MBES	Multi-beam echo sounder
NI 43-101	Canadian National Instrument 43-101
NOAA	National Oceanic and Atmospheric Administration
NORI	Nauru Ocean Resources Inc.
NN	Nearest neighbour estimation method
NPV	Net present value
OD	Outside diameter
OK	Ordinary kriging – an estimation method utilising distance-weighted local averages
OMI	Ocean Mining Inc.

OMCO	Ocean Minerals Company
PEA	Preliminary economic assessment
PFS	Pre-feasibility study
PLS	Pregnant liquor/leach solution
POX	Pressure oxidative leaching
PSV	Production support vessel
QAQC	Quality assurance and quality control
QP	Qualified Person, as defined by Canadian National Instrument 43-101
RALS	Riser and lift system
R-type	Rough type nodules
Regulations	Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area
ROV	Remotely operated vehicle
RKEF	Rotary kiln and electric furnace
SBP	Sub-bottom profiler
S-R-type	Smooth-rough type nodules
SSS	Sidescan sonar
S-type	Smooth type nodules
SV	Sulphidation vessel
SX	Solvent extraction
TOC	Total organic carbon
TOML	Tonga Off-shore Mining Limited
UNCLOS	United Nations Convention on the Law of the Sea
USBL	Ultra-short baseline
UTM	Universal Transverse Mercator Cartesian coordinate system
UTP	Underwater transponder array
Var	Variance
WROV	Work Class remotely operated vehicle
XRF	X-ray fluorescence analysis
Yuzhmorgeologiya	State Enterprise Yuzhmorgeologiya (Russian Federation)

List of elements

Al	Aluminium
As	arsenic
Ba	barium
Ca	calcium
Cd	cadmium
Ce	cerium
Cl	chlorine
Co	cobalt
Cu	copper
Fe	iron
H_2O	hydrogen dioxide
H_2S	hydrogen sulphide
K	potassium
La	lanthanum
Mg	magnesium
Mn	manganese
MnO	manganese oxide
MnO2	manganese dioxide
Mo	molybdenum
Na	sodium
NaHS	sodium hydro sulphide
Na_2S	sodium sulphide
Nd	neodymium
Ni	nickel
P	phosphorus
Pb	lead
REE	rare earth elements
S	sulphur
SiO2	silicon dioxide
Sr	strontium
Ti	titanium
V	vanadium
Y	yttrium
Zn	zinc
Zr	zirconium

List of units

°	degree
°C	degrees Celsius
%	percent
% w/w	% mass/mass or weight
µm	microns
cm	centimetre
cm/s	centimetre per second
dmtu	dry metric tonne unit
G	gram
GWh	gigawatt-hours
kg	kilogram
kg/m²	kilograms per square metre (surface abundance)
km	kilometre
km²	square kilometre
kPa	kilopascal
kt	kilotonne (metric)
kt/a	kilotonnes (metric) per annum
kWh/h	kilowatt hours per hour
kWh/t	kilowatt hours per tonne
Lb	pound
M	metre
m/h	metres per hours
m/s	metres per second
m^2	square metre
m^3	cubic metre
m³/y	cubic metres per year
mbsl	metres below sea level
mg/L	milligrams per litre
mm	millimetre
MPa	megapascal
Mt	million tonnes(metric)
Mtpa	million tonnes (metric) per annum
mV	millivolt
MW	megawatt
nm	nautical mile
Nm^3	cubic metre of gas at standard temperature and pressure
ppm	parts per million
ppmw	parts per million weight
S	second
T	tonne (metric)
t/d	tonnes (metric) per day
t/h	tonnes (metric) per hour
US$	United States dollar
y	year

2 Introduction

A very large nickel, manganese, cobalt, and copper resource occurring as polymetallic nodules is located in the Clarion-Clipperton Zone (CCZ) of the northeast Pacific Ocean between Hawaii and Mexico. The nodules are located at depths of between 4,000 to 6,000 m and have been explored with considerable success between the mid-1960s and the present day using a variety of deep-sea technologies. Successful trial extraction in the CCZ has also been carried out to demonstrate that the nodules can be collected and pumped to a surface platform and processed for recovery of metals.

Interest in seafloor mineral deposits grew through the 1960s. Several commercial and government funded organisations and consortia started exploring the oceans as part of a cooperative program known as the International Decade of Ocean Exploration. These organisations became known as Pioneer Investors.

Exploration of the seafloor in international waters is now administered by the International Seabed Authority (ISA) and regulated by the United Nations Convention on the Law of the Sea (UNCLOS). These institutions operate on the principle that the ocean floor beyond the limits of national jurisdiction, known as the Area, is the common heritage of mankind.

In July 2011, Nauru Ocean Resources Inc. (NORI), a subsidiary of DeepGreen Metals Inc. (DeepGreen), was granted an exploration contract over 74,830 km^2 (the NORI Area or the Property) in the CCZ consisting of four exploration areas (Area A, B, C and D). NORI's contract for exploration of polymetallic nodules was approved by the Council of the ISA on 19 July 2011, for a term of 15 years and then signed with the ISA on 22 July 2011.

DeepGreen commissioned AMC Consultants Pty Ltd (AMC) to undertake an Initial Assessment (IA) of the Mineral Resource contained in one of these blocks, NORI Area D, (the Project) and compile a Technical Report Summary compliant with SEC Regulation S-K (subpart 1300).

2.1 Purpose of the Technical Report Summary

AMC understands that DeepGreen may file this Technical Report Summary with Securities Exchange Commission as part of an S-4 filing to support the merger between Sustainable Opportunities Acquisition Corporation and DeepGreen Metals Inc.

2.2 Sources of information and data

This Technical Report Summary is based on information and reports supplied by NORI or in the public domain. Section 27 lists background documents that are referenced by the higher-level reports.

2.3 Field involvement

Ian Stevenson, an independent consultant trading as Margin - Marine Geoscience Innovation participated in the 2018 off-shore campaign (Campaign 3) on the Maersk Launcher which carried out surveys and sampling in the NORI Area D from 26 April - 4 June 2018. Ian Lipton, Principal Geologist, AMC, was involved in the development of sampling strategies and procedures and was in daily contact with the off-shore campaign as it was implemented, providing input as required to ensure data quality and veracity.

2.4 Personnel

The Sections that each of the Qualified Persons (QPs) were responsible for are summarised in Table 2.1. In addition, each of the QPs contributed to Sections 22 to 24, where relevant to the Sections for which they were primarily responsible.

AMC has relied upon information provided by the registrant in preparing its findings and conclusions regarding some aspects of modifying factors, as set out in Section 25.

Table 2.1 List of Qualified Persons responsible for each Section

Qualified Person	Responsible for the following report Sections:
AMC Consultants Pty Ltd	Sections 1-5, 8.2, 8.3, 8.4, 8.5, 9, 11, 12, 13.3, 13.7, 14.2, 15.1, 16, 17, 18 (except 18.3.1, 18.3.2, 18.6.1, 18.6.6), 19, 20-25
Margin - Marine Geoscience Innovation	Sections 6, 7, 8.1
Canadian Engineering Associates Ltd	Sections 10, 14.1, 14.3, 18.3.2, 18.6.6
Deep Reach Technology Inc	Section 13.1, 13.2, 13.4, 13.5, 13.6, 15.2, 18.3.1, 18.6.1

2.5 Reliance on other experts

The QPs have relied upon other experts for some sections in this report. These are summarised in Table 2.2.

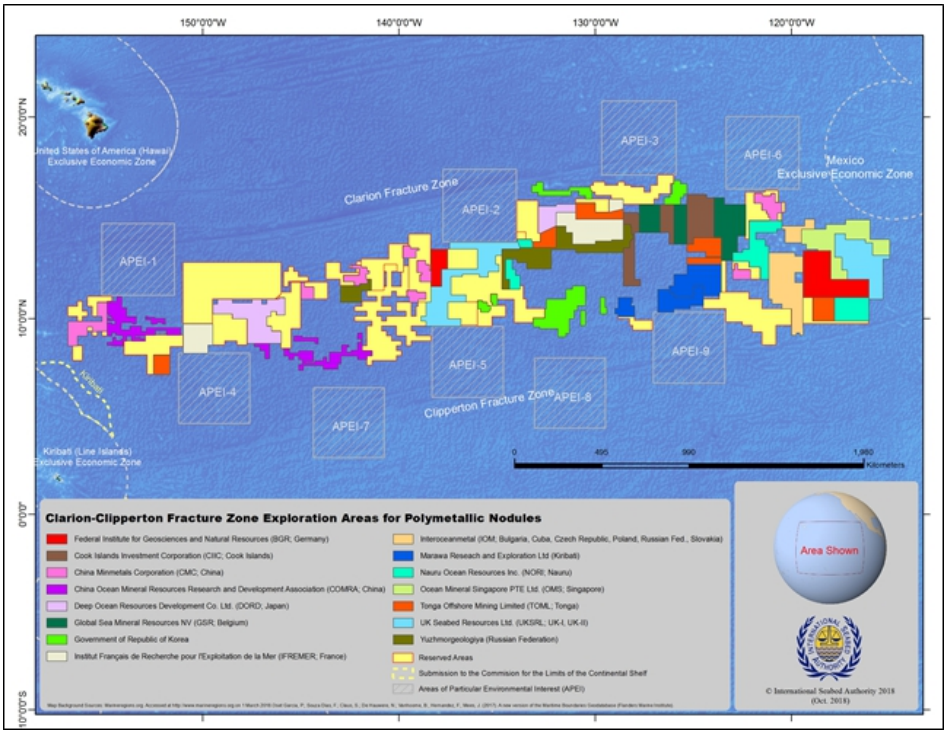
Table 2.2 Reliance on other experts

Expert	Report Sections:
Picton Group Pty Ltd	Section 17

3 Property description and location

The NORI Property is located within the CCZ of the northeast Pacific Ocean Figure 3.1. The CCZ is located in international waters between Hawaii and Mexico. The western end of the CCZ is approximately 1,000 km south of the Hawaiian island group. From here, the CCZ extends over 4,500 km east-northeast, in an approximately 750 km wide trend, with the eastern limits approximately 2,000 km west of southern Mexico. The region is well-located to ship nodules to the American continent or across the Pacific to Asian markets.

Figure 3.1 Location of NORI Project and other exploration areas within the Clarion-Clipperton Zone



Source: https://www.isa.org.jm/map/clarion-clipperton-fracture-zone, downloaded 18 February 2021

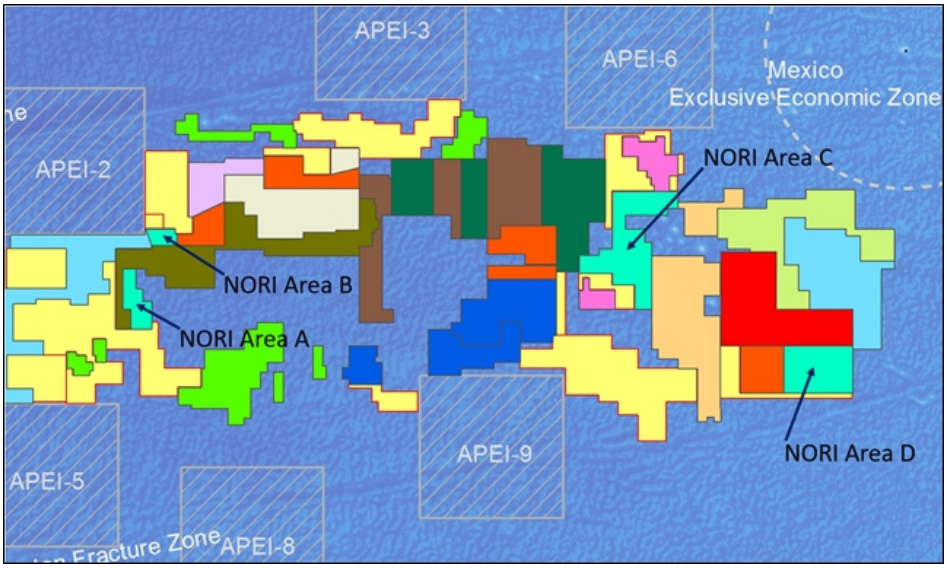
3.1 Tenements and permits

In July 2011, NORI was granted a polymetallic nodule exploration contract by the ISA (NORI Exploration Contract). The contract was granted pursuant to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted 13 July 2000) and formalises an exploration area, a term of 15 years for the contract, and a program of activities for the first five-year period (NORI Exploration Contract). The contract also formalises the rights of NORI around tenure. Pursuant to the Regulations, NORI has the priority right to apply for an exploitation contract to exploit polymetallic nodules in the same area (Regulation 24(2)).

The NORI Exploration Contract may be extended for periods of 5 years at a time beyond the initial 15-year period, provided NORI has made efforts in good faith to comply with the requirements of the plan of work.

The NORI contract area comprises four separate blocks (A, B, C and D) in the CCZ with a combined area of 74,830 km^2 Figure 3.2, Table 3.1 and Table 3.2. These areas were previously explored by three Pioneer Investors.

Figure 3.2 Detail of location of NORI Areas A, B, C and D, from Figure 4.1



Source: https://www.isa.org.jm/map/clarion-clipperton-fracture-zone, downloaded 18 February 2021. Legend as in Figure 4.1

Table 3.1 NORI Area block details

Area	Size (km^2)	ISA block number	Pioneer investor
A	8,924	13	Yuzmorgeologiya
B	3,519	15	Yuzmorgeologiya
C	37,227	22	Interoceanmetal Joint Organisation (IOM)
D	25,160	25	Arbeitsgemeinschaft Meerestechnisch Rohstoffe (AMR)

Table 3.2 NORI Area extents

Area	Minimum Latitude (DD)	Maximum Latitude (DD)	Minimum Longitude (DD)	Maximum Longitude (DD)	Minimum UTM X (m)	Maximum UTM X (m)	Minimum UTM Y (m)	Maximum UTM Y (m)	UTM Zone
A	11.5000	13.00000	-134.5830	-133.8330	545220.4	627276.0	1271339	1437255	8
B	13.5801	14.00000	-134.0000	-133.2000	607995.7	694759.8	1501590	1548425	8
C	12.0000	14.93500	-123.0000	-120.5000	500000.0	769458.3	1326941	1652649	10
D	9.8950	11.08333	-117.8167	-116.0667	410465.2	602326.1	1093913	1225353	11

DD – Decimal degrees, UTM - Universal Transverse Mercator map projection

To date, no exploitation licences for extracting minerals from the seafloor within the Area have been granted.

3.1.1 United Nations Convention on the Law of the Sea

The international seabed area (otherwise known as the Area) is defined as the seabed and subsoil beyond the limits of national jurisdiction (UNCLOS Article 1). Figure 3.3 shows a map of the Area (blue zone) as well as 200 nautical mile exclusive economic zones (grey zone) and extended continental shelf zones (orange zone). Figure 3.4 shows the relationships between depth, distance and jurisdiction.

The principal policy documents governing the Area include:

- The United Nations Convention on the Law of the Sea, of 10 December 1982 (The Convention).
- The 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (the 1994 implementation Agreement).

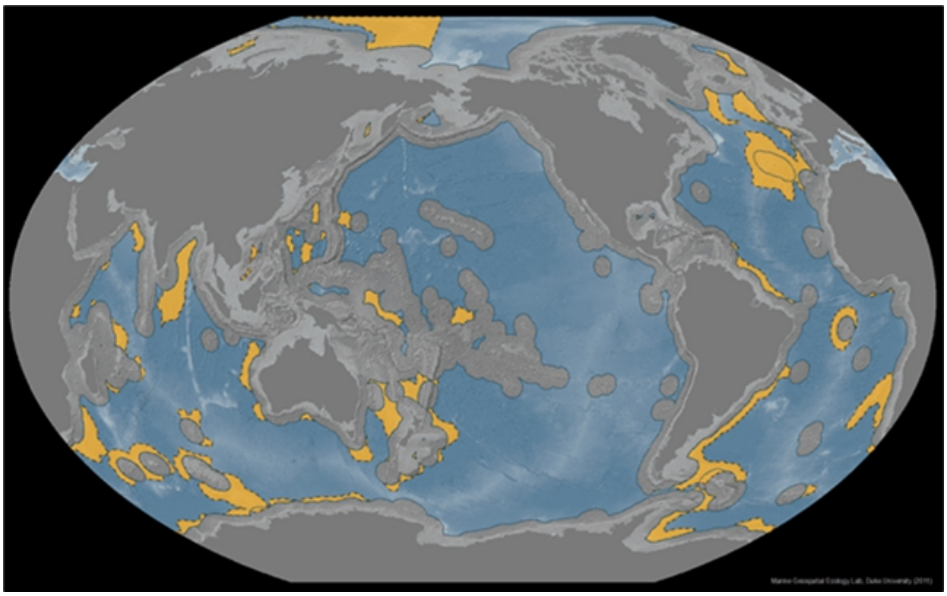
The Convention deals with, among other things, navigational rights, territorial sea limits, exclusive economic zone jurisdiction, the continental shelf, freedom of the high seas, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits, conservation and management of living marine resources in the high seas, protection of the marine environment, marine scientific research, and settlement of disputes.

Part XI of the Convention and the 1994 Implementation Agreement deals with mineral exploration and exploitation in the Area, providing a framework for entities to obtain legal title to areas of the seafloor from the ISA for the purpose of exploration and eventually exploitation of resources.

The Convention entered into force on 16 November 1994. A subsequent agreement relating to the implementation of Part XI of the Convention was adopted on 28 July 1994 and entered into force on 28 July 1996. The 1994 Implementation Agreement and Part XI of the Convention are to be interpreted and applied together as a single instrument.

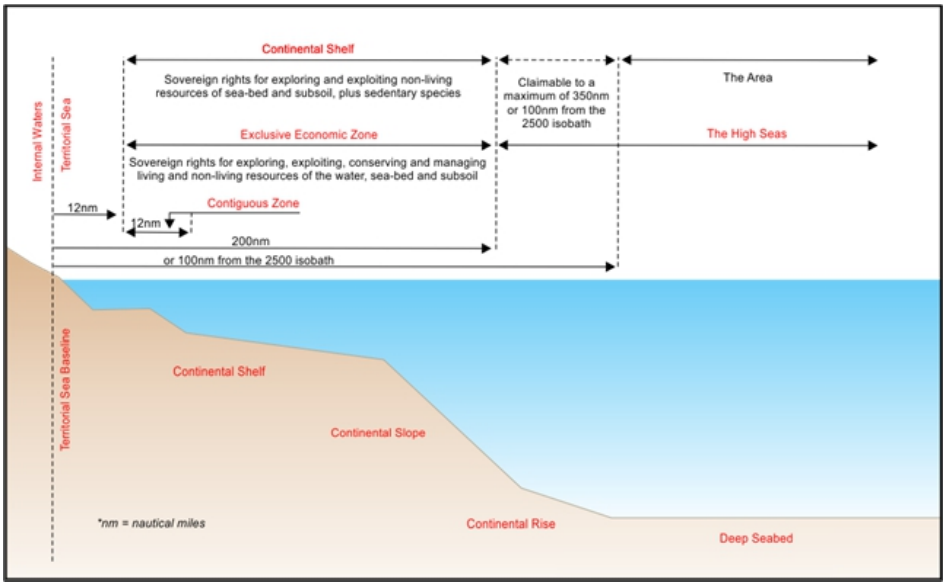
As of 20 August 2020, the Convention had been signed by 167 States (countries) and the European Union. The United States of America is currently not a party to the Convention.

Figure 3.3 Map of seafloor jurisdictions



Note: International seabed area map (blue zone) as well as 200 nautical mile exclusive economic zones (grey zone) and extended continental shelf zones (orange zone). Source: Marine Geospatial Ecology Lab, Duke University (2011).

Figure 3.4 Maritime space under the 1982 UNCLOS



Source: DeepGreen - adapted from UNCLOS, 1982

3.1.2 International Seabed Authority

The ISA is an autonomous international organisation established under the Convention and the 1994 Implementation Agreement to organise and control activities in the Area, particularly with a view to administering and regulating the development of the resources of the Area in accordance with the legal regime established in the Convention and the 1994 Implementation Agreement.

All rules, regulations, and procedures issued by the ISA to regulate prospecting, exploration, and exploitation of marine minerals in the Area are issued within a general legal framework established by the Convention and the 1994 Implementation Agreement.

To date, the ISA has issued (https://www.isa.org.jm/mining-code/ Regulations):

- The Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted 13 July 2000; the Regulations).
- The Regulations on Prospecting and Exploration for Polymetallic Sulphides (adopted 7 May 2010).
- The Regulations on Prospecting and Exploration for Cobalt-Rich Ferromanganese Crusts in the Area (July 2012).

The ISA is currently working on the development of a legal framework to regulate the exploitation of polymetallic nodules in the international seabed area.

In 2014, the ISA completed a study looking at comparative extractive regulatory regimes. This was followed in March 2014 with a stakeholder survey seeking comments on what financial, environmental, and health and safety obligations should be included under the framework (ISA 2014).

In March 2019, the Council of the ISA released the advance and unedited text (English only) of the Draft Regulations on Exploitation of Mineral Resources in the Area (ISBA/25/LTC/WP.1) (ISA, 2018). The revised draft incorporated the consideration of requests addressed to the Legal & Technical Commission by the Council during the first part of the 24th Session in March 2018, comments by the Commission, and also reflected the responses to the first draft from stakeholder submissions. The ISA declared a target of July 2020 to have the regulations approved, however the July session was deferred as a result of COVID-19 pandemic.

Pursuant to paragraph 15(a) and (b) of Section 1 of the annex to the 1994 Implementation Agreement, which relates to article 162 (2)(o)(ii) of the Convention, the ISA Council must also adopt such exploitation regulations within two years of a formal request being made by any State which intends to apply for approval of a plan of work for exploitation.

3.2 NORI obligations and sponsorship

During exploration NORI, is required to, among other things:

- Submit an annual report to the ISA.
- Meet certain performance and expenditure commitments.
- Pay an annual overhead charge (currently US$60,000) to cover the costs incurred by the ISA in administering and supervising the contract.
- Implement training programs for personnel of the ISA and developing countries in accordance with a training program proposed by NORI in its licence application and five-year work plans.
- Take measures to prevent, reduce, and control pollution and other hazards to the marine environment arising from its activities in the Area.
- Maintain appropriate insurance policies.
- Establish environmental baselines against which to assess the likely effects of its program of activities on the marine environment.
- Establish and implement a program to monitor and report on such effects.

NORI is sponsored to carry out its mineral exploration activities in the Area by the Republic of Nauru, pursuant to a certificate of sponsorship signed by the Government of Nauru on 11 April 2011. Sponsorship of an entity requires the sponsoring State to certify that it assumes responsibility for the entity's activities in the Area in accordance with the Convention. NORI is a Nauruan incorporated entity and is subject to applicable Nauruan legislation and regulations.

In 2015 the Republic of Nauru enacted the International Seabed Minerals Act, which establishes the Nauru Seabed Minerals Authority to administer Nauru's sponsorship of activities carried out in the Area by companies sponsored by Nauru.

In June 2017, the Republic of Nauru and NORI entered into a Sponsorship Agreement formalising certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI Contract Area of the CCZ.

3.2.1 Work program

As of the date of this Technical Report, NORI is in the ninth year of its exploration contract.

In 2016 NORI submitted to the ISA proposed activities for the second five-year period of its exploration contract. NORI indicated that work would focus on:

- Reducing project uncertainties and technical risks.
- Optimising the on-shore processing and off-shore production systems (including increasing performance and reliability).
- Improving project economics, including decreasing estimated capital and operating expenditure as well as increasing projected revenues.

NORI forecast estimated expenditure of US$5 million over the period 2017 to 2021, however noted the figure may be revised based upon the results of the next phase of engineering work. To date NORI has exceeded this level of expenditure on the NORI Contract Area.

3.2.2 Royalties and taxes

Royalties and taxes payable on any future production from the NORI Area will be stipulated in the ISA's exploitation regulations. While the rates of payments are yet to be set by the ISA, the 1994 Implementation Agreement (Section 8[1](b)) prescribes that the rates of payments "shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage."

An ad hoc ISA working group workshop held on 21–22 February 2019 discussed a number of potential royalty and taxation regimes supported by modelling conducted by the Massachusetts Institute of Technology. No formal recommendations were forthcoming however a 2% ad valorem royalty increasing to 6% after a period of five years of production was discussed as well as a 1% ad valorem environmental levy. This is what has been included in the IA model.

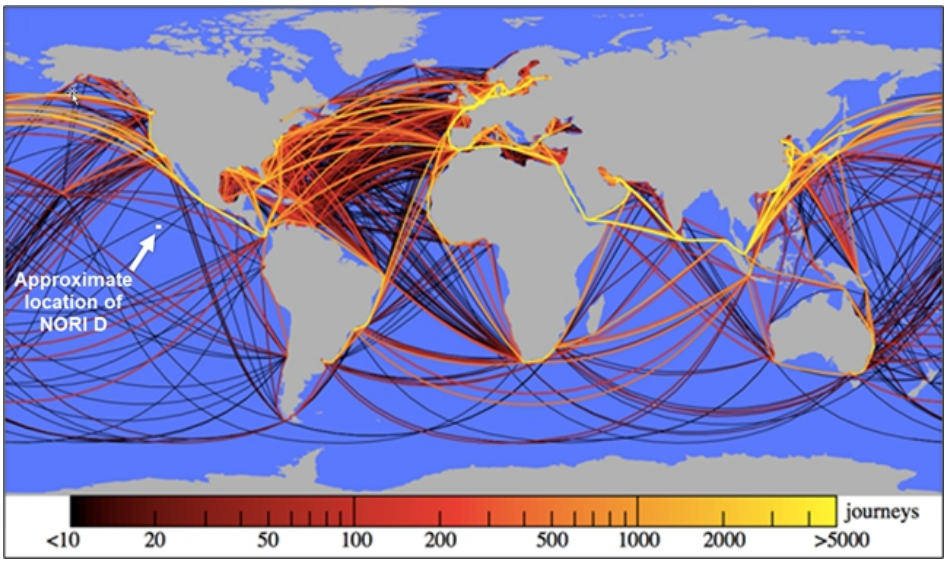
Under the Sponsorship Agreement between the Republic of Nauru and NORI, upon reaching a minimum recovery level within the tenement area, NORI has agreed to pay the Republic of Nauru a seabed mineral recovery payment for polymetallic nodules recovered from the tenement area, annually adjusted (from year 5 of production) on a compounding basis based on the official inflation rate in the USA.

4 Accessibility, climate, local resources, infrastructure, and physiography

4.1 Accessibility and infrastructure

The CCZ lies between Hawaii and Mexico and is accessible by ship from various ports in the United States and South America. As the CCZ deposit does not include any habitable land and is not near coastal waters, there is no requirement to negotiate access rights from landowners for seafloor mining operations. All personnel and material will be transported to the project area by ship. The region is well located to ship nodules to the American continent or across the Pacific Ocean to Asian markets. The CCZ is generally outside major shipping lanes as indicated in Figure 4.1 which shows the global cargo shipping network, illustrating the trajectories of all cargo ships bigger than 10,000 gross tonnage during 2007.

Figure 4.1 Global cargo shipping network



Note: The colour scale indicates the number of journeys along each route.
Source: Adapted from Kaluza et al. 2010.

4.2 Climate

The CCZ has a tropical oceanic climate, with average temperatures of from 20 to 32 °C. Minimum and maximum temperatures generally occur in March and September, respectively (ISA 2001), and the average sea surface temperature is 25 °C. The CCZ is located in open ocean and is subject to tropical weather patterns.

Off-shore operations are planned to run throughout the year, with the exception of hurricane events, which are expected to occur once every three years. Tropical hurricanes are difficult to predict due to their erratic frequency but have high intensity over short periods and occur mostly during the period from May to October (Tilot, 2006, GSR 2018).

5 History

5.1 Overview

Submarine ferromanganese concretions were first discovered in the Kara Sea off Siberia in 1868 (ISA 2010, citing Earney 1990). HMS Challenger, during its round the world expedition from 1873 to 1876, collected many small dark brown balls, rich in manganese and iron, which were named manganese nodules (ISA 2010 citing Murray and Reynard [1891], Manheim [1978], and Earney [1990]).

Since the 1960s, polymetallic nodules have been recognised as a potential source of nickel, copper, cobalt, and manganese, and have been comparatively well studied because of their potential economic importance (Mero 1965). Scientific expeditions demonstrated that polymetallic nodules have a widespread occurrence in the world's oceans although their metal content and concentration vary from region to region.

During the International Decade of Ocean Exploration and prior to the implementation of UNCLOS, many off-shore exploration campaigns were completed by international organisations and consortia. A number of at-sea trial mining operations were successfully carried out in the CCZ in the 1970s to test potential mining concepts. These system tests evaluated the performance of a self-propelled and several towed collection and mining devices, along with submersible pumps and airlift technology for lifting the nodules from the deep ocean floor to the support vessel.

The US National Oceanic and Atmospheric Administration (NOAA) monitored some of these tests as the principal effort of the Deep Ocean Mining Effects Study (DOMES II) program. The information collected during these activities provided key inputs to the impact analysis presented by NOAA in its Final Programmatic Deep-Sea Mining Environmental Impact Statement.

5.2 Pioneer Investors

For the purpose of this report the Pioneer Investors include those entities that carried out substantial exploration in the Area prior to the entry into force of the Convention, as well as those entities that inherited such exploration data. This Section describes some of the more important activities of the Pioneer Investors.

NORI Area D was originally explored by Arbeitsgemeinschaft Meerestechnisch Rohstoffe (AMR). AMR subsequently joined Ocean Management Inc. (OMI). The OMI consortium comprised Inco Ltd (Canada), AMR (Federal Republic of Germany), SEDCO Inc. (US), and Deep Ocean Mining Co. Ltd (Japan). OMI completed a successful trial mining operation in 1978. Hydraulic pumps, an air lift system, and towed collectors were tested in approximately 4,500 m of water. Approximately 800 t of nodules were recovered.

Kennecott consortium (now a division of Rio Tinto) first became seriously interested in seafloor polymetallic nodules in 1962 (Agarwal et al. 1979). In the 1970s, Kennecott developed and tested components and subsystems of a seafloor mining system, and also carried out significant polymetallic nodule metallurgical processing test work.

Using a different system to OMI, Ocean Mining Associates recovered approximately 500 t of nodules during its trial mining in the 1970s.

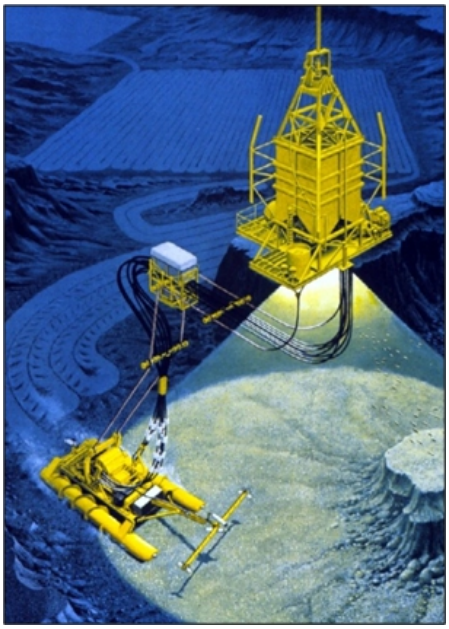
Between 1969 and 1974, Deepsea Ventures Inc. carried out 16 survey cruises of three to four weeks' duration each, to define the extent of the polymetallic nodule deposit discovered by them in 1969 in the CCZ. As reported by Deepsea Ventures Inc:

"These activities included the taking of some 294 discrete samples, including the bulk dredging of some 164 tons of manganese nodules from some 263 dredge stations, 28 core stations and three grab sample stations, cutting of some 28 cores, approximately 1000 lineal miles of survey of seafloor recorded by television and still photography, etc. As a result, the deposit of nodules identified with the discovery has been proved to extend generally throughout the entire area (American Society of International Law, 1975)."

Also active in the CCZ was the Ocean Minerals Company (OMCO), comprising Amoco Minerals Co. (United States), Lockheed Missiles and Space Company Inc. (United States), Billiton International Metals BV, and dredging company Bos Kalis Westminster (Netherlands). In a program lasting 16 years, OMCO collected thousands of free-fall grab and box core samples of nodules from its claim area (Spickermann 2012) and carried out trial mining. Lockheed's design efforts resulted in over 80 patents, a seafloor production system that consisted of a remote-controlled collector and crusher, a seafloor to surface slurry riser system, the first industrial scale dynamic positioning system for a vessel, and a metallurgical processing plant (Spickermann 2012).

In 1978, OMCO used a remote controlled fully manoeuvrable self-propelled miner with conveyor and crusher Figure 5.1 and Figure 5.2 to trial mine polymetallic nodules in the CCZ at approximately 4,500 mbsl. The miner used an Archimedes screw drive system to provide traction and accurate manoeuvrability on the seafloor. Nodules were picked up by the miner and transferred to the buffer, where they were to be pumped to the surface by an airlift system.

Figure 5.1 Schematic of Lockheed Group's 1970s trial mining system



Source: DeepGreen. Used with permission of Prof. Jin Chung.

Figure 5.2 Remote operated collector used by the Lockheed Group in 1970s trial mining



Source: Spickerman 2012.

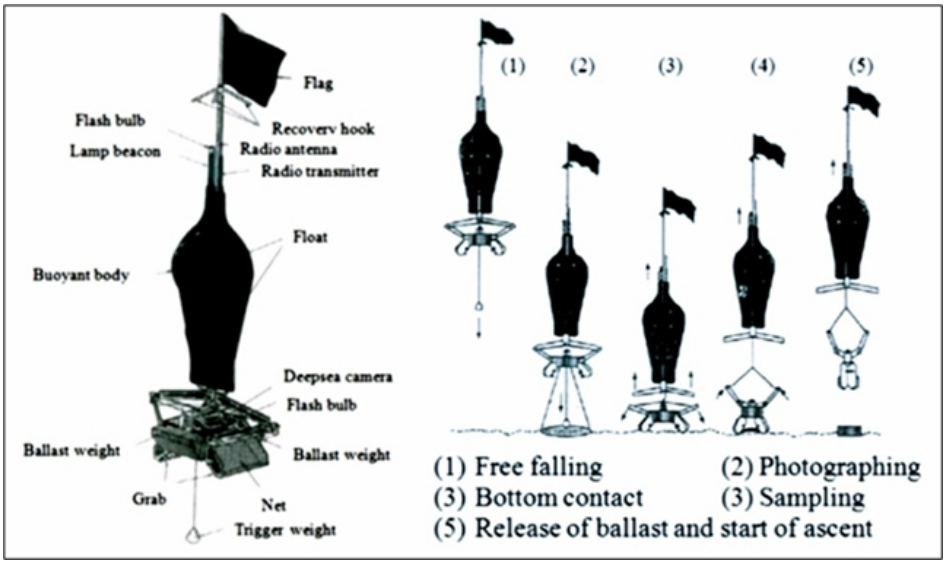
5.3 Sampling methods

Prior to NORI obtaining its exploration contract, sampling of seafloor nodules within the NORI Area was conducted by three Pioneer Investors; AMR, State Enterprise Yuzmorgeologiya of the Russian Federation and lnteroceanmetal Joint Organisation (IOM), a consortium formed by Bulgaria, Cuba, the Czech Republic, Poland, the Russian Federation, and Slovakia.

Nodule samples collected by the Pioneer Investors from within the NORI Area were obtained by free-fall grab samplers (FFG) along with a few from box corers. For each sample the nodule abundance (wet kg/m^2) was derived by dividing the weight of recovered nodules by the surface area covered by the open jaws of the sampler or corer (typically 0.25 to 0.5 m^2 but in some cases as much as 1 m^2). Sample splits were dried and assayed by atomic absorption spectrophotometry (AAS) and X-ray fluorescence (XRF).

Free-fall grab samplers are currently the most productive tool available for sampling nodules. This is because a number of them can be deployed at any one time from the survey vessel allowing an order of magnitude increase in collection efficiency compared to box core sampling (i.e., approximately 10 to 20 samples per day for a FFG versus 2 to 3 samples per day for a box core (BC) that is winched to and from the seafloor). Figure 5.3 shows the operation of an FFG sampler.

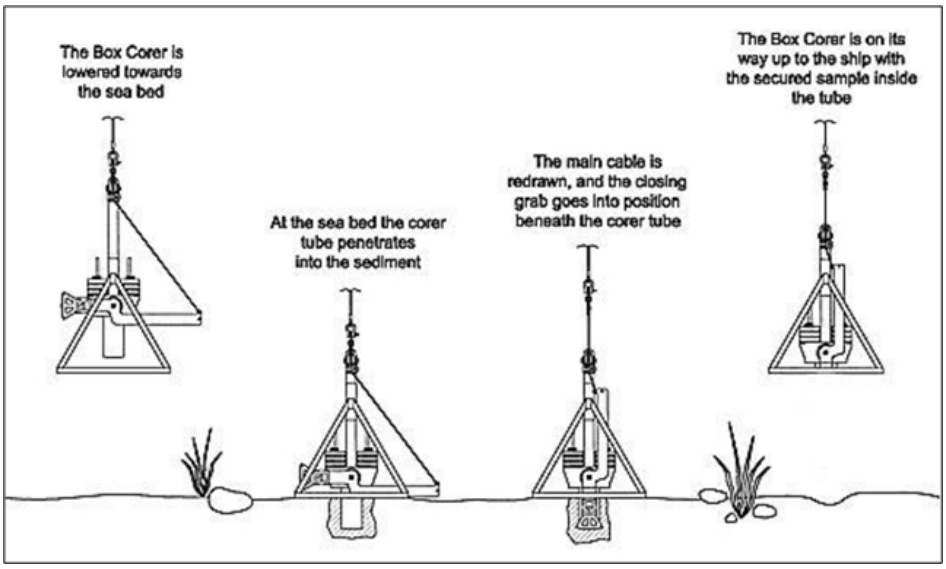
Figure 5.3 Free fall grab sampler operation



Source: ISA 1999b.

The box core is the preferred sampling method for retrieving polymetallic samples for resource evaluation and environmental studies. The box core consists of a trigger, plunger, and cutting shovel. Upon land out on the seafloor, the trigger is released which allows the plunger to push a box cutter into the substrate during retraction. Upon retraction, the cutting shovel rotates under the box while cutting into the seafloor and sealing the sample box from below
Figure 5.4.

Figure 5.4 Box core sampler operation



Source: KC Denmark box corer manual.

Comparison of nodule abundance measurements by free-fall grab samplers and box cores suggests that free-fall grab samplers commonly underestimate the actual abundance. This is due to smaller nodules escaping the sampler during ascent and larger nodules around the edge of the sampler being knocked out during the sampling process. Additionally, free-fall grab samplers occasionally fail to return any nodules where nodule abundance is known to be very high because the sampler fails to penetrate the layer of nodules.

Lee et al. (2008) examined correction factors between FFG and BC in some detail. They found a wide range but consistent differences with FFG under-reporting compared to BC. They recommended an overall correction factor of 1.4 to convert FFG abundance to BC abundance. However, they acknowledged that any simple factor lacks precision. One of the key issues is the size of the FFG or BC relative to the nodule diameter.

No corrections were applied to the NORI Area nodule abundance data.

5.4 Sample preparation and analysis

Information about sample preparation and analysis by the Pioneer Investors is summarised below. Additional information is provided in the Technical Report on NORI Area D, Clarion Clipperton Zone Mineral Resource Estimate, April 2019 (AMC, 2019).

5.4.1 Ocean Minerals Company

While OMCO data are not included in the datasets used for resource estimation in the NORI Area, they are discussed here as the method described below is believed to be similar to the method practised by those contractors that did contribute to the NORI Area data.

Polymetallic nodule samples were laid out separately on a white surface marked with a scaled grid and photographed to permit determination of nodule size distribution. They were then sealed in labelled fibreglass-reinforced collection bags and stored in the ship’s hold for the balance of the exploration cruise. The samples were transported from the ship to the Lockheed Ocean Laboratory in San Diego.

Prior to weighing, the samples were removed from the sample bags and placed in a single layer in labelled open trays on tables in the air-conditioned laboratory for at least 12 hours to ensure a uniform degree of air drying. The samples were then weighed using a high-capacity laboratory scale and divided into two subsamples of approximately equal weight.

The second subsample was crushed using a jaw crusher to produce a product with a maximum size of less than about 1 mm. The crushed sample was then mixed and passed through a laboratory sample splitter to produce a 5 to 10 g subsample. The subsample was further ground to a fine powder using a laboratory ball mill prior to assaying.

The powdered subsample was placed in an oven at 110 °C for at least six hours to remove adsorbed water. It was then immediately transferred to a sealed desiccator to cool to ambient temperature.

A three-acid digest was used to dissolve the samples before analysis by AAS using a Hewlett-Packard instrument. Standard analysis included determination of manganese, iron, cobalt, nickel, copper, zinc, silica, calcium, and magnesium.

Analytical accuracy was confirmed by periodic introduction of standards made from crushed, mixed, and powdered bulk nodule samples that had also been sent to three independent commercial laboratories for determination of these metal contents. Additional confirmation was achieved using standards formulated by the US Geological Survey (A-1 and P-1; Flanagan and Gottfried 1980). These standards were subjected to the entire preparation procedure to ensure that no significant contamination was occurring and that no systematic analytical errors were being included in the process.

5.4.2 Yuzhmorgeologiya

The Yuzhmorgeologiya method was very similar to the method practiced by OMCO. The Yuzhmorgeologiya data cover NORI Area A and B.

The measurement of abundance of nodules at the sample site was carried out using an “enclosed” Ocean-0.25 FFG sampler with a 0.25 m^2 gripped surface and a depth of sampling of approximately 30 cm. The FFG sampler was combined with GFU-6-8 photography unit. This device took ocean bottom photos at the sampling point.

The procedure for sub-sampling was as follows:

1. Extraction of all nodules from the grab sampler.
2. Crushing of all nodules to a maximum particle size of up to 10 mm.
3. Drying (approximately 24 h) of all samples at 105°C until constant weight was achieved.
4. Crushing of all samples to 1 to 2 mm particle size and splitting of 400 to 500 g using a splitting device.
5. Pulverising of the split sample (not less than 400 g) was carried out in the vibrating grinder up to 100 mesh particle size (0.074 mm).
6. Formation of analytical sample (200 g) and its duplicate (200 g).

Chemical analyses were carried out on subsamples with an approximate weight of 0.5 g, selected from the analytical sample. Determination of nickel, copper, cobalt, and iron content was carried out by AAS and the content of manganese by a method of photometric (electrometric) titration.

5.4.3 IOM

Information regarding IOM procedures is not currently available. However, the procedures used by IOM for sample collection and assaying are likely to be similar to the sampling and assaying procedures used by the other Pioneer Investors. The results of the IOM sampling are consistent with the results obtained by other Pioneer Investors within the NORI area and within the broader CCZ.

5.4.4 Preussag

Preussag completed polymetallic nodule exploration programs in the CCZ aboard the Valdivia in the 1970s. Nodule sampling was mainly carried out using free-fall grab samplers and box corers.

After the sampling devices arrived on the working deck of the research vessel, the nodules were removed from the sediment surface (box corer) or taken from the FFG samplers and transported in plastic boxes into the geological laboratory. There, several sample treatments were carried out:

- Nodules were cleaned (if necessary) from adhering mud using filtered seawater.
- Nodules were carefully dried with paper towels.
- Nodules were photographed on a surface with a scaled grid.
- Individual nodules were measured.
- Individual nodules and the total nodules from one device were weighed with a special balance (determination of wet weight).

A detailed description including the identification of the types of nodules was conducted.

One part of the nodules was used for further investigations in the ship's laboratory. The other nodules were stored in plastic bags, which were weighed once more. Then the plastic bags were filled with seawater in order to keep the nodules in a water-saturated state. These samples were required for further studies and investigations in the home laboratories (e.g., physical properties, detailed chemical analyses, X-ray phase analysis, metallurgical tests, polished sections).

The first part of the nodules taken from one sampling device were crushed to a particle size smaller than 10 mm and then dried in an oven at ±105 °C until constant weight was achieved. Further steps of grinding in the ship's laboratory took place with a final procedure of pulverising with a ball mill producing a fine powder with a particle size of less than 100 mesh (less than 74 µm). Then the sample was passed through a laboratory sample splitter to produce several representative subsamples.

One subsample was taken as representative archive sample. Two other subsamples were dried again for at least five hours to remove the rest of adsorbed water prior to analysis.

Two methods were used to determine the key metals nickel, copper, cobalt, manganese, iron, and zinc. The first one was the AAS analysis to measure nickel, copper, zinc, and cobalt, and the second was the energy-dispersive XRF method with ratio-isotope excitation to determine manganese and iron. A sample digestion was necessary to carry out the AAS determination. For this, the dried powder was treated with a mixture of acids in a high-pressure Teflon vessel and heated for several hours to complete the digestion. The digested fluid was diluted with distilled water and analysed with the spectrometer, and the residue was weighed. The XRF analysis was performed with the powder (pressed tablets). Data quality and analytical reliability were confirmed by intermediate introduction and measurement of reference nodule samples. These reference standards consisted of powdered material which was subjected to the same procedure as described above.

5.5 QA/QC procedures

Free-fall grab samplers are considered to underestimate the actual abundance but provide adequate samples for determining the grade of the nodules (Hennigar et al. 1986).

QA/QC was known to be undertaken at the time of sampling as part of the scientific process used by each Pioneer Investor. However, no systematic quality assurance and quality control (QA/QC) information is available for these programs, as this information was not provided by the ISA. Nonetheless, the acceptance of the data by the ISA suggests the ISA was satisfied with the quality of the data.

The quality of the data was assessed (Golder 2015) using comparative measures between the different datasets (Section 9.1.2). The correlation of data from different sources, including Pioneer Investors and government scientific institutes, provides a satisfactory level of quality assurance to support Mineral Resource estimates at an Inferred level of confidence.

5.6 Pioneer Investor sample data supplied to NORI

Upon making an application, the Pioneer Investors were required to submit sufficient data and information to enable designation of a reserved area based on the estimated commercial value. These sample data provide the basis of a database held by the ISA and were used initially to define the areas of the NORI application.

The sample sites were sampled by a combination of grab samplers and box corers of different sizes and designs, with the full details of the sampling tools at a given site mostly being unavailable. As a result, sample quality, spacing, and assay reliability vary from contractor to contractor, sample to sample, and block to block. Average sample spacing (based on the data supplied by the ISA) varies across the CCZ, ranging from less than 1 km and averaging approximately 10 km within the NORI Area.

Statistics for the samples that contain both abundance and grade data inside the NORI Area are tabulated in Table 5.1 and illustrated as boxplots in Figure 5.5. The box plots show the range of grades; the box represents the range of grades in the middle 50% of the samples, centred on the median (middle value) and box width reflects number of samples. The dashed lines represent the range of the lowest 25% and highest 25% of the data.

Cobalt in NORI Area D is significantly lower than the other NORI areas, however, abundance is consistently higher in NORI Area D than the other NORI areas and the CCZ Reserved Blocks in general Figure 5.5.

The range of the assays (as summarized by the coefficient of variation) is remarkably low compared to most terrestrial Mineral Resources. Abundance values vary more widely, making abundance estimates the key variable of uncertainty in Mineral Resource estimation.

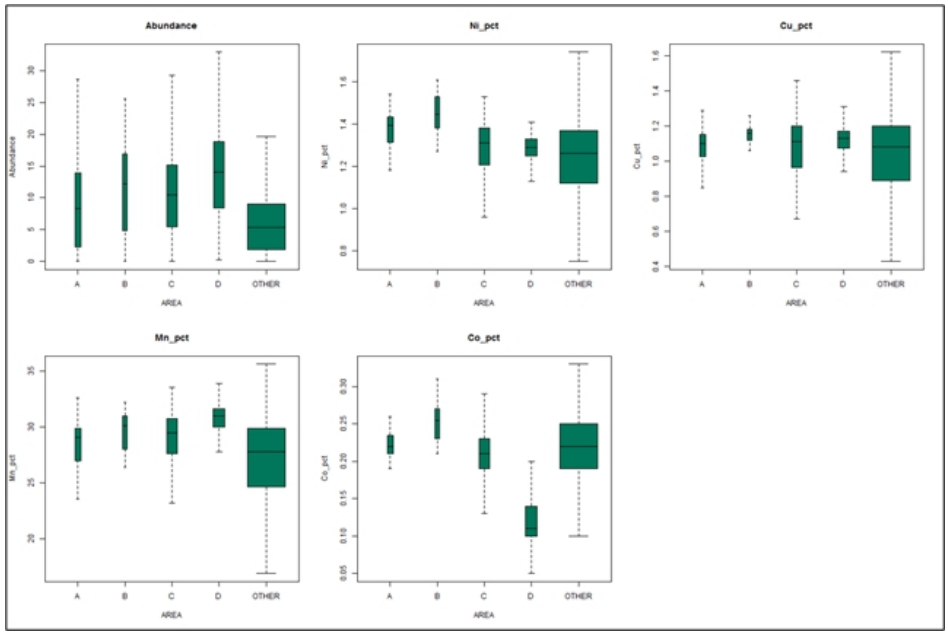
The abundance of buried nodules is poorly known at this time. Thus, buried nodules are not included in exploration information or Mineral Resource estimates.

Table 5.1 Summary of historical FFG samples in the NORI Area

NORI Area	Grade	Number	Missing	Min	Max	Mean	Median	Var	cv
A	Abundance (wet kg/m^2)	50	0	0	28.7	9.3	8.2	57.366	0.81
	Ni (%)	40	10	1.04	1.75	1.37	1.39	0.016	0.09
	Cu (%)	40	10	0.66	1.29	1.07	1.1	0.017	0.12
	Mn (%)	40	10	19.77	32.6	28.06	28.98	8.577	0.1
	Co (%)	40	10	0.16	0.28	0.22	0.22	0.001	0.11
B	Abundance (wet kg/m^2)	31	0	0	25.55	11.24	12	50.536	0.63
	Ni (%)	26	5	1.01	1.61	1.42	1.44	0.021	0.1
	Cu (%)	26	5	0.72	1.26	1.12	1.16	0.016	0.11
	Mn (%)	26	5	20.8	32.2	28.88	29.8	9.939	0.11
	Co (%)	26	5	0.21	0.31	0.25	0.25	0.001	0.09
C	Abundance (wet kg/m^2)	152	0	0	44.1	10.55	10.33	52.902	0.69
	Ni (%)	135	17	0.68	1.53	1.27	1.31	0.025	0.12
	Cu (%)	135	17	0.4	1.46	1.05	1.11	0.048	0.21
	Mn (%)	135	17	12.84	33.54	28.63	29.42	11.648	0.12
	Co (%)	135	17	0.12	0.33	0.21	0.21	0.001	0.17
D	Abundance (wet kg/m^2)	159	0	0.2	52.2	14.12	13.9	72.243	0.6
	Ni (%)	159	0	1.09	1.41	1.28	1.29	0.004	0.05
	Cu (%)	159	0	0.88	1.5	1.14	1.13	0.012	0.1
	Mn (%)	159	0	23.8	33.9	30.58	31	3.12	0.06
	Co (%)	159	0	0.05	0.2	0.12	0.11	0.001	0.26

Notes: Var = variance; CV = coefficient of variation.

Figure 5.5 Box plots of sample grades within the NORI Area compared with all other data from the Reserved Blocks



Note: Box size represents 1st and 3rd quartiles centred on the median and box width reflects number of samples.

6 Geological setting and mineralisation

6.1 Global distribution of nodules

Seafloor polymetallic nodules occur in all oceans, and the CCZ hosts a relatively high abundance of nodules. Other relatively dense zones are found in the Peru Basin in the southeast Pacific, the centre of the north Indian Ocean, and the Cook Islands Figure 6.1.

Figure 6.1 Schematic diagram of average abundance of polymetallic nodules in four major locations



Source: GRID-Arendal 2014b.

6.2 Tectonic setting and topographic features

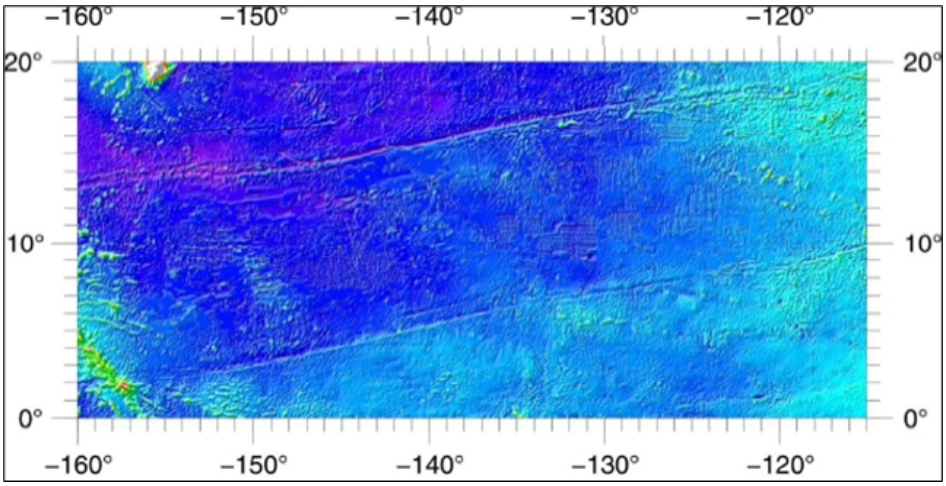
The CCZ is defined by two major west-south-west and east-north-east trending fracture zones running through the seafloor; the Clipperton Fracture Zone to the south and the Clarion Fracture Zone to the north. These fractures zones can be seen clearly on the bathymetric map Figure 6.2. The eastern and western limits can be defined by the Mathematicians Seamounts or Ridge in the east, and the Republic of Kiribati or Line Islands in the west.

The CCZ seafloor forms part of the Abyssal Plains, which are the largest physiographic province on Earth, covering some 70% of the area of ocean basins and 30% of the Earth's surface (ISA 2004). The Abyssal Plains are traversed by ridges, believed to have formed from the process of seafloor spreading. Orientation is north-north-west to south-south-east (locally ±20˚), with amplitude of 50–300 m (maximum 1,000 m; Hoffert 2008) and wavelength of 1 to 10 km. The bathymetric map of NORI Area D Figure 7.1, shows these ridges clearly. The Abyssal Plains are punctuated by extinct volcanoes rising 500 to 2,000 m above the seafloor.

Depth increases from 3,800 to 4,200 m at 115˚ west to 4,800 to 5,200 m at 130˚ west, and 5,400 to 5,600 m at 145˚ west.

The sediment types exhibit trends perpendicular to the fracture zones, from predominant carbonate sediments in the south-eastern extreme to predominant siliceous red clay in the west north-west.

Figure 6.2 Bathymetric map of the Clarion-Clipperton Fracture Zone



Source: ISA 2010.

6.2.1 Sedimentation and nodule formation

Seafloor polymetallic nodules are composed of nuclei and concentric layers of iron and manganese hydroxides and formed by precipitation of metals from seawater. The metal accumulation rates are slow, and it generally takes millions of years to form a nodule (ISA 2004).

Nodules are abundant in abyssal areas with oxygenated bottom waters, low sedimentation rates (less than 10 cm per thousand years), and where sources of abundant nuclei occur (Hein et al. 2013). Nodules grow on 0.1 to 1 cm nuclei (e.g., pieces of pumice and older broken nodules) and generally range from about 1 to 12 cm in their longest dimension, with the low to middle-range typically the most common (1 to 5 cm).

The specific conditions of the CCZ (water depth, latitude, and seafloor sediment type) are considered to be the key controls for its formation, along with the following factors:

- Supply of metals to the growing surface.
- Presence of a nucleus.
- The corrosive / erosive forces caused by benthic currents.
- Occurrence of semi-liquid surface layer on the seafloor (sediment water interface).
- Bioturbation.

The highest values of metals in nodules are thought to be best developed on the seabed in the equatorial regions away from land sources of sediments. In these regions surface waters have high primary productivity. Tiny plants and animals concentrate the metals from seawater and when they die, they sink to the seafloor, dissolve, and release the metals into the pore water of seafloor sediments. It is believed that the upper portion of the nodules accumulate metals that are precipitated from seawater, while the lower portion of the nodules, partially buried in sediment, accumulate metals from pore-water in the underlying sediments.

Sediments from the CCZ consist mostly of clays and siliceous biological casts. Sands and larger sediments are not generally found so far from land, and the commonly formed carbonate biological casts dissolve on the seabed in these deep-water regions faster than they accumulate.

6.3 Polymetallic mineralisation

6.3.1 Nodule grades

Nodule chemistry varies only slightly with in the CCZ. Figure 6.3 shows that there is a general increase in combined cobalt, nickel and copper grades towards the south-east (Kazmin in ISA 2003; ISA 2010; Morgan 2009). The reason for this is not clear but may relate to proximity to metal sources from the East Pacific Rise or the American continents.

Average (mean) grades for elements of interest other than nickel, manganese, copper, and cobalt from 248 samples of nodules taken within the NORI area during the NORI 2018 and 2019 offshore exploration campaigns are summarised as:

- Other base or alloy metals such as zinc (0.21% ZnO), titanium (0.43% TiO_2), and lead (0.03% PbO).
- Rare earth and other transition metals such as strontium (0.071% Sr), yttrium (0.009% Y), zirconium (0.033% Zr), lanthanum (0.011% La), cerium (0.022% Ce), and neodymium (0.013% Nd).
- Other elements such as iron (6.6% Fe), magnesium (3.2% MgO), aluminium (3.95% Al_2O_3), sulphur (0.28% SO_3), calcium (2.4% CaO), potassium (1.1% K_2O), sodium (2.9% Na_2O), phosphorus (0.36% P_2O_5), vanadium (0.049% V), and barium (0.43% Ba).

Analysis of 20 samples collected by NORI in 2012 showed that arsenic content is low (0.008% As).

6.3.2 Nodule abundance

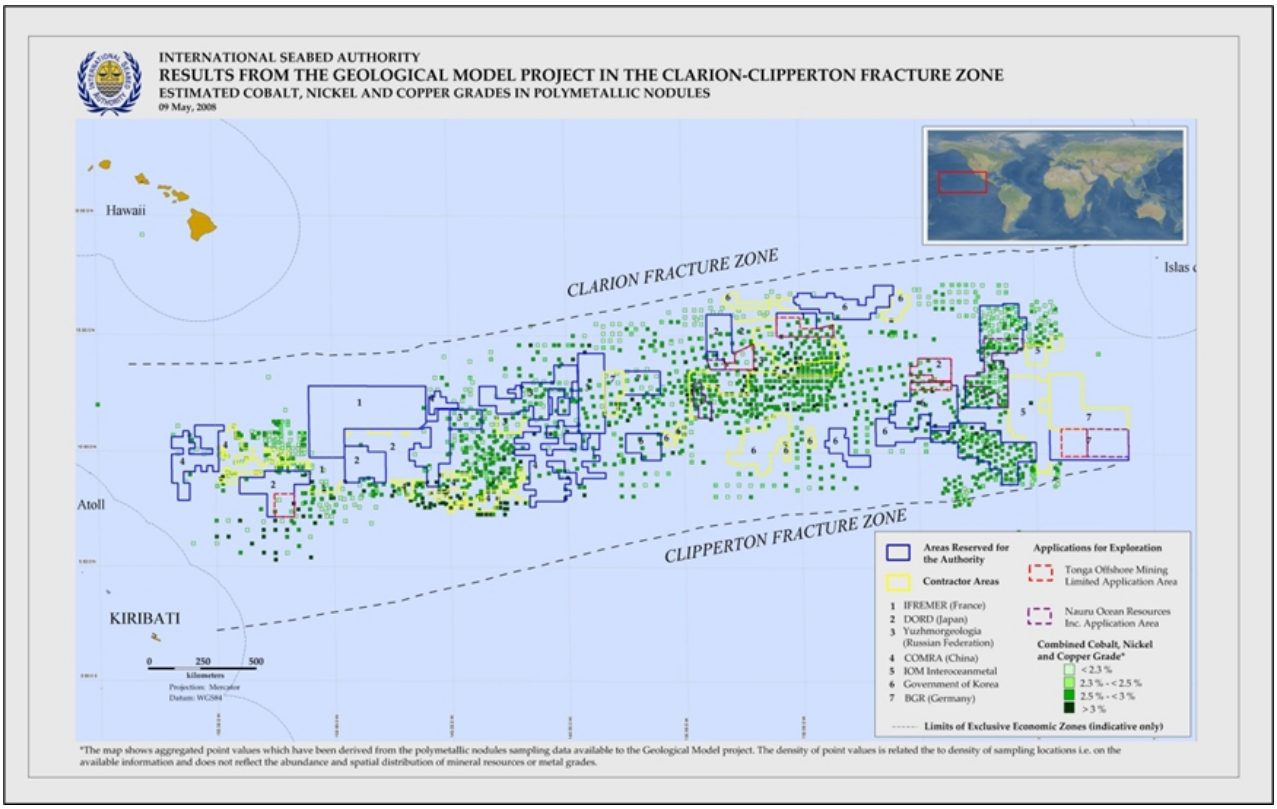
Polymetallic nodules lie on the seafloor sediment, often partly buried. Some nodules are completely buried, although the frequencies of such subsurface occurrences are very poorly defined. Kotlinski and Stoyanova (2006) document up to five discrete layers of buried nodules, although all were within 45 cm of the surface despite using sediment cores of 250 to 380 cm depth (i.e., all of these nodules are near surface). Other images of box corers also suggest that all or most of the nodules are at the surface. Consequently, drilling is not required for definition of the Mineral Resources.

During the 2018 NORI campaign, 91% of nodules sampled were situated at surface. These include nodules on the surface and nodules with their top surfaces in the upper 1 cm of sediment. A few nodules were found at depth; most of these were usually clustered around the edges of the box core and are considered to have been pushed below surface by the box coring process. Significant nodule abundance below surface was only recorded in one out of 45 samples.

The nodules vary in abundance, in some cases touching one another and covering more than 70% of the seafloor. They can occur at any depth, but the highest concentrations have been found on abyssal plains between 4,000 and 6,000 mbsl.

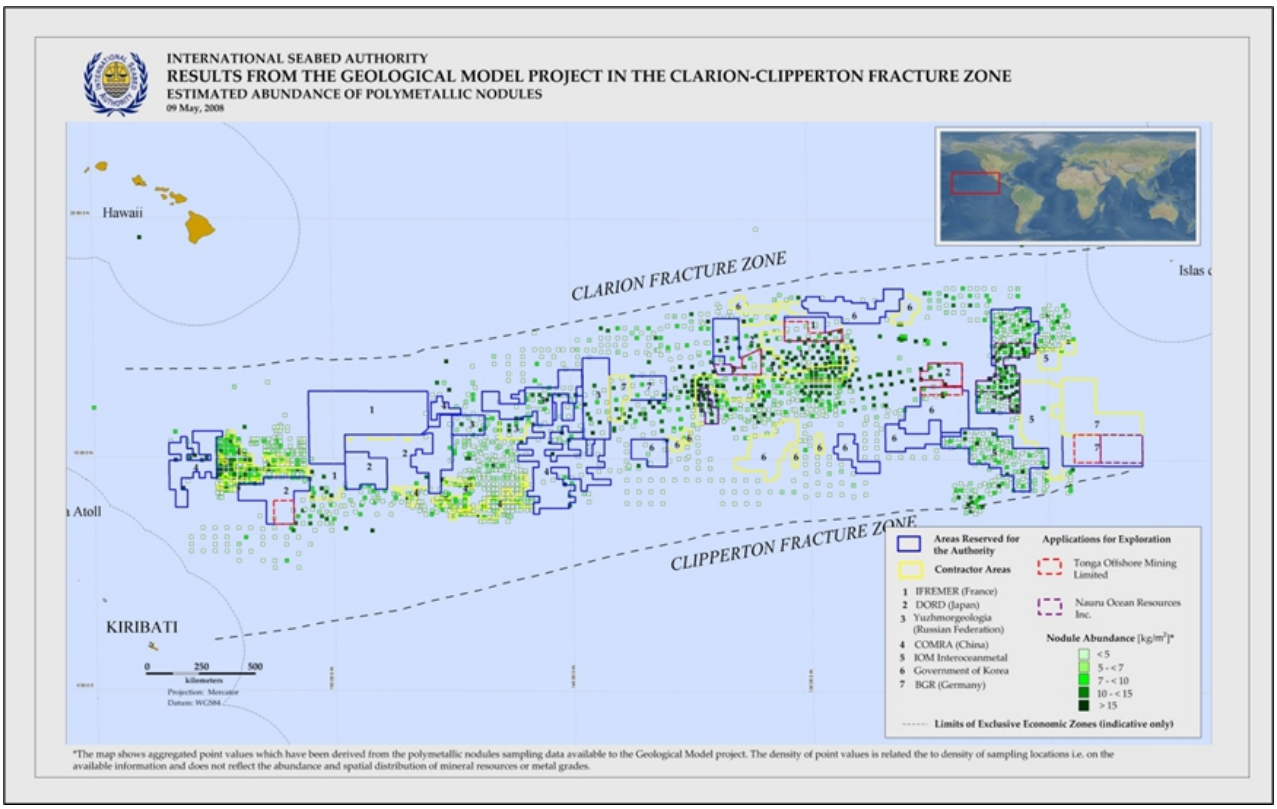
Figure 6.4 shows estimated nodule abundance data from the ISA Geological model project. Data analysis in Section 9 shows that nodule abundance variability is significantly higher than metal grades, suggesting that abundance estimation will be the key variable in Mineral Resource estimation.

Figure 6.3 Results from ISA Geological Model Project in the CCZ - combined cobalt, nickel, and copper grades



Note: The German data for NORI Area D were not included in the ISA Geological Model.
Source: provided by the ISA directly to NORI in 2008.

Figure 6.4 Results from the ISA Geological model project in the CCZ estimated nodule abundance

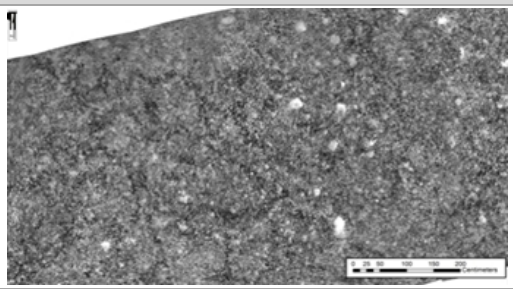
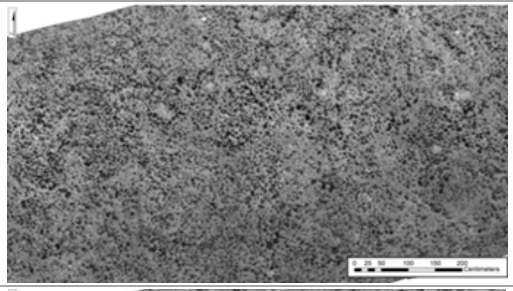
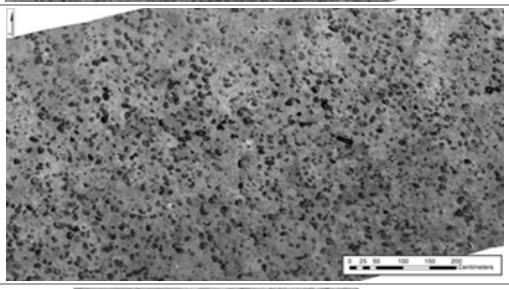
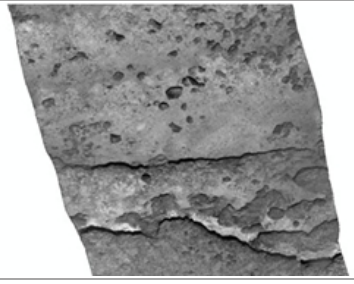


Note: The German data for NORI Area D were not included in the ISA Geological Model.
Source: ISA 2008.

6.4 Seafloor polymetallic nodule facies

Three broad classes of nodule distribution on the seafloor were identified, based on camera imagery. They are summarised in Figure 6.5.

Figure 6.5 Polymetallic nodule facies in NORI Area D

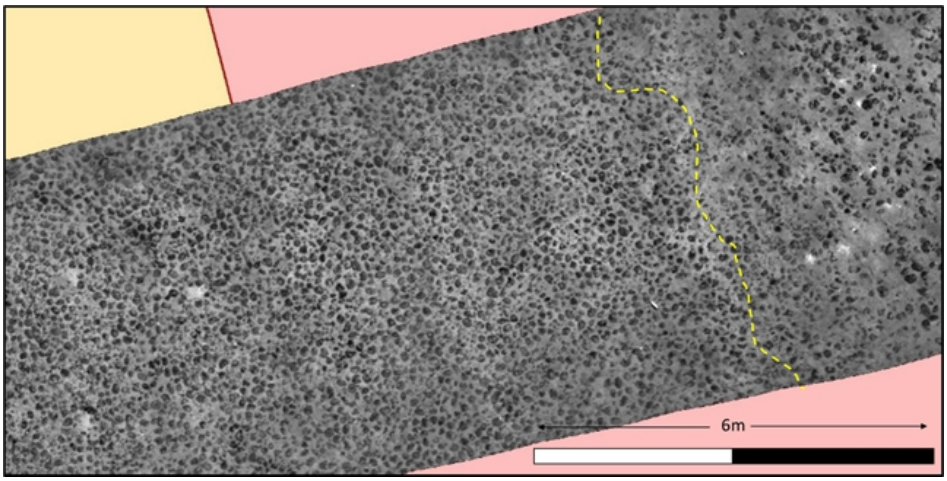
Nodule camera facies type	Description	Example
Type 1 densely packed / interconnected	>50% nodules ~1–10 cm, uncertain. Low to moderate confidence in camera imagery to resolve individual nodules	
Type 2 mostly individual / locally interconnected	~20–40% Nodules ~5–20 cm Moderate to high confidence in camera imagery to resolve individual nodules	
Type 3 mostly Individual / sparse	10–20% nodules ~5–20 cm Moderate to high confidence in camera imagery to resolve individual nodules	
Other	Volcanic outcrop - associated with NW-SE ridges	

Type 1 nodule facies (distribution pattern) is typically characterised by >50% nodules (by area of coverage). The majority of these nodules are typically medium-sized and are closely packed, with many nodules in contact with their neighbours.

Types 2 and 3 are characterised by lower nodule abundance, larger nodules, and the nodules are typically separated (i.e., there are noticeable sediment gaps between individual nodules).

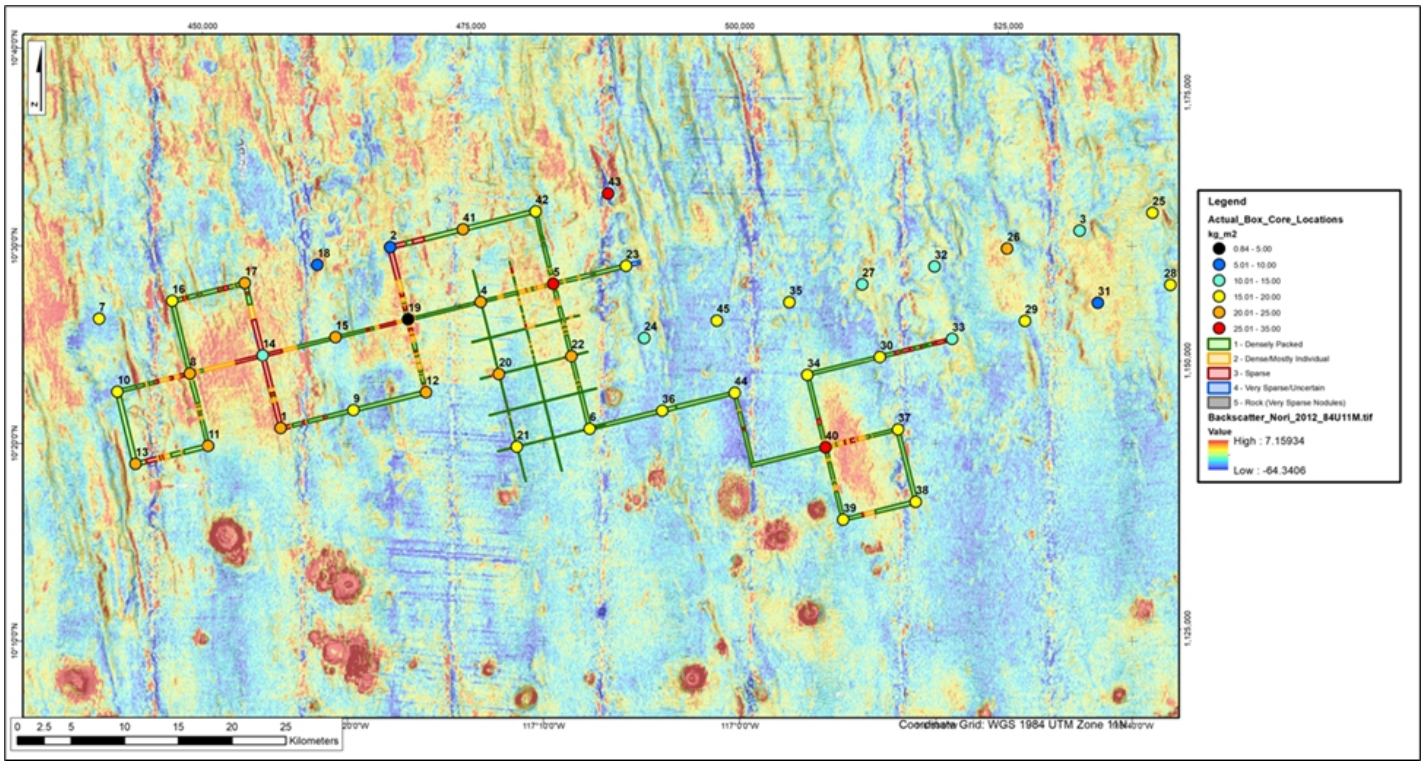
Facies boundaries are often well-defined (i.e., not gradational) and variable over short distances (<100 m), as illustrated in Figure 6.6.

Figure 6.6 Camera imagery showing change from Type 3 nodules (left), to Type 2 (right)



Nodule distributions can be mapped by measuring the backscatter (return signal) from multi-beam echo sounding (MBES) from vessels on the ocean surface. Type 1 nodule facies correlates with moderate-amplitude backscatter areas and is the most common facies. Type 2 and 3 nodule facies typically correlate with higher-amplitude backscatter areas. These correlations are shown in Figure 6.7 which shows nodule classification according to photographic traversing by autonomous underwater vehicle (AUV) (ribbon-track coloured: Type1 (green), Type 2 (yellow), Type 3 (red)) against a background of backscatter data. The backscatter responses are coloured by amplitude; high-amplitude areas associated with Type 2 and 3 nodule facies shown in warmer colours, with Type 1 represented by colder colours.

Figure 6.7 Map of nodule facies classification in NORI Area D



Note: Box core locations are labelled with box core number and coloured by abundance. Ribbon-track coloured by facies Type: Type1 (green), Type 2 (yellow), Type 3 (red)) against a background of backscatter data. The backscatter responses are coloured by amplitude; high-amplitude areas associated with Type 2 and 3 nodule facies shown in warmer colours, with Type 1 represented by colder colours.

6.5 Topographic / bathymetric facies

Based on analysis of bathymetric data from the 2012 and 2018 campaigns, together with the significant sampling data acquired during 2019, it was possible to refine the geological domain interpretations which characterise nodule prospectivity. Eight domains were interpreted for NORI Area D:

1. **Abyssal plains** – These constitute the majority of NORI Area D and are characterised by gentle slopes of 0˚ to 6˚, and nodules lying on soft sediment. Nodules were observed to be ubiquitous in this domain wherever it was surveyed and sampled. It is considered a highly- prospective domain for nodules.

   The Abyssal Plains can be further divided into three sub-domains based on backscatter acoustic response and ground-truthing (box core samples and land-out video footage):

   - Areas considered indicative of Type 2 and 3 nodule facies, as determined from backscatter correlation (17% area coverage).
   - Sediment drift domains - characterised by a soft sediment ooze with low acoustic backscatter, and extremely low to no nodule abundance (1% area coverage).
   - Volcanic cones (see below) (4% area coverage).
   - The remaining area (78%) is likely indicative of Type 1 nodule facies and considered highly prospective.

2. **Abyssal Hills** – These are topographically higher features, oriented NNW-SSE, and are parallel to one another. Slopes of the hills are mostly gentle at the western side, while they are very steep at the eastern side, likely representing horsts bounded by inward-dipping normal faults and outward-dipping volcanic growth faults respectively.

3. **Abyssal Hills (hard)** – Abyssal Hills where the hill crests are associated with the occurrence of hardgrounds, caused by proximity of underlying (harder) Neogene footwall succession at seafloor, typically covered by a very thin veneer of unconsolidated sediment.

4. **Slopes ³ 6°** – These are associated with the flanks of Abyssal Hills, where the slope is 6° or greater, and are likely associated with hardgrounds and/or volcanic debris and volcanic outcrop development typically associated with NNW trending faults. These steep slopes are considered to have low nodule prospectivity but have not been fully tested with sampling or photography.

5. **Slopes ³ 6° (hard)** – These are associated with the flanks of Abyssal Hills where the slope is 6˚ or greater, and are associated with hardground development, typified by outcropping (harder) Neogene footwall succession. These steep slopes are considered to have low nodule prospectivity, based on box core sampling, AUV SBP data and photography.

6. **Volcanic Outcrop** – This is associated with volcanic growth-faults along the Abyssal Hill flanks, which trend NNW-SSE, and are elongated, narrow bodies mapped through integration of AUV SBP and camera data with EM 122 MBES data backscatter data.

7. **Volcanic Cones** – These are typically grouped in chains and follow the ‘Hawaiian Trend’. Some of these features could be classed as Knolls, as they exhibit a 500–1000 m rise from the seafloor. These are isolated features and were not sampled during the 2018 or 2019 NORI Campaigns. However, because of their volcanic origin, steep slopes (>6˚) and dominant high-intensity backscatter (typically associated with volcanic outcrop), they are also considered to have low nodule prospectivity.

8. **Volcanic High** – This is a macro-scale topographic feature situated in the SE corner of NORI Area D. It is interpreted as a relic volcanic intersection high, which also includes a relic transform parallel trough. Both are volcanic related features associated with the Clipperton transform zone, situated to the south of NORI Area D.

These domains are described further in Section 11.2.

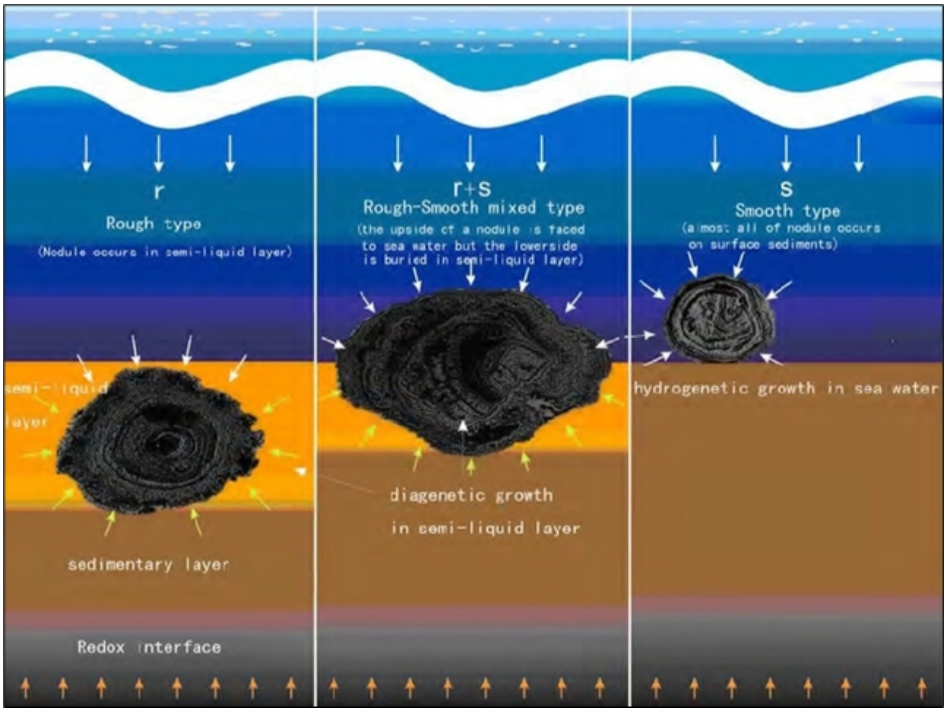
6.6 Nodule morphology and formation

A variety of nodule classification systems have been used in previous studies of the CCZ (for example, Haynes et al. 1985), but the three-class system promoted by the ISA (ISA 2010) prevails today Figure 6.8. Nodules are classified according to their texture, as:

- S-type (smooth type)
- R-type (rough type)
- S-R-type (smooth-rough mixed type)

It is postulated that the different textures are related to the position of the growing nodule, relative to the seafloor, as shown in Figure 6.8.

Figure 6.8 Polymetallic nodule types (ISA 2010)



Source: ISA 2010.

7 Exploration

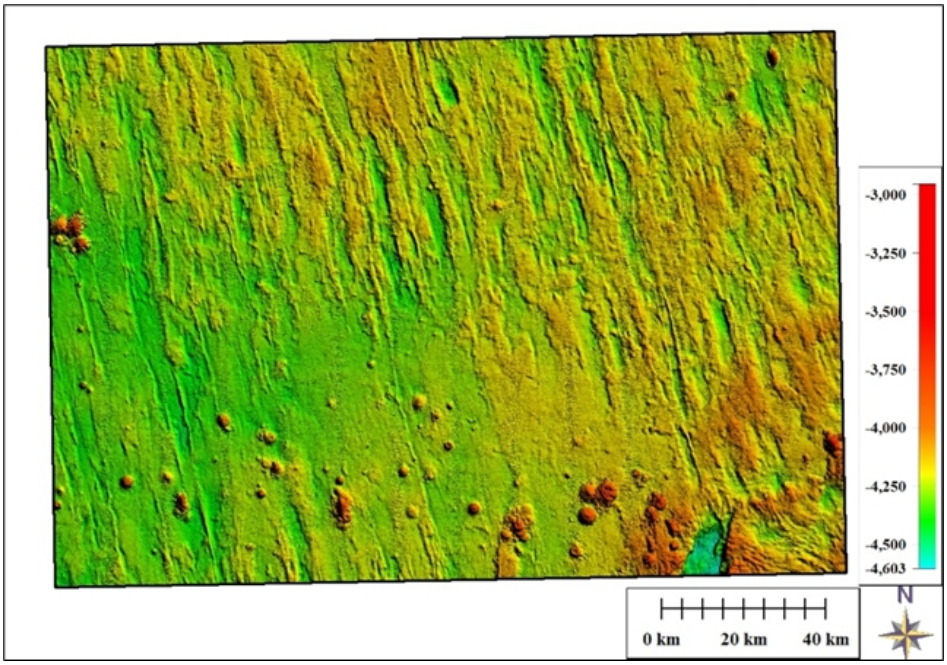
NORI completed off-shore exploration campaigns in July–August 2012, in 2013, May 2018, August to December 2019.

7.1 NORI 2012 campaign

The RV Mt. Mitchell, which sailed from the port of Seattle, was used for the NORI 2012 campaign. NORI conducted bathymetric mapping of the seafloor within NORI Area C and D, as well as bulk nodule sampling for metallurgical test work. Due to the nature of the bulk sampling, these samples are not suitable for use in Mineral Resource estimation.

Using a hull-mounted Kongsberg Simrad EM120 12 kHz, full-ocean depth multibeam system, approximately 25,720 km^2 was surveyed in NORI Area C and approximately 25,439 km^2 in NORI Area D. Due to swath width and vessel orientation relative to course-made-good, some data were recorded beyond the bounds of those areas. Approximately 69.1% of Area C (25,720 km^2) was surveyed. Area D was surveyed in its entirety (25,439 km^2). An image of the bathymetric data for NORI Area D, in plan view, is shown in Figure 7.1.

Figure 7.1 NORI Area D bathymetry data



Note: The canted box is a result of projecting a large geographic area bounds (given in latitude / longitude format) into UTM 10 N, WGS 84.

MBES data was processed during the 2012 NORI Campaign and used to locate areas of high nodule density for dredge sampling, based on the bathymetric surfaces and the backscatter intensities. Overall, the geophysical interpretation of the multibeam data was remarkably successful.

Bulk samples were collected by dredging from NORI Area C (five dredge deployments) and NORI Area D (28 dredge deployments). Approximately 280 kilograms (kg) of nodules were recovered from Area C and approximately 4,500 kg from NORI Area D. Video footage was also obtained during dredge deployments and, together with the samples recovered, provided physical verification of nodules within NORI Area C and D Figure 7.2.

Twenty (20) nodule samples (two (2) from Area C and 18 from Area D) recovered during the NORI 2012 campaign were assayed. Each sample for assaying, was a subsample of an FFG sample and weighed approximately 1 kg. Results of assaying indicated a mean grade of 1.20% nickel, 1.03% copper, 27.9% manganese, and 0.13% cobalt. These mean values are consistent with the mean grades derived from the historical grab samples within NORI Area C and D see Table 7.1. The cobalt value of 0.13% confirms the cobalt grades in the German data in Area D. A large suite of additional elements was also assayed. A drying test undertaken on a nodule sample collected during the NORI 2012 campaign indicated moisture loss of 24% at 120 °C.

Figure 7.2 Subset of nodule samples recovered during NORI's 2012 exploration campaign



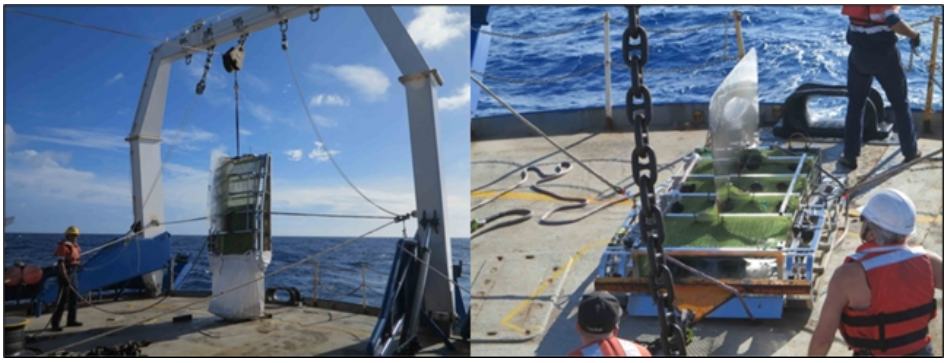
7.2 NORI 2013 campaign

In 2013, NORI carried out a second exploration campaign within NORI Area A and B. This campaign was also undertaken using RV Mt. Mitchell and focused mapping bathymetry in NORI Area A and B, identifying nodule fields based on acoustic data (including interpretation of backscatter data), and recovering bulk polymetallic nodule samples.

A hull-mounted Kongsberg Simrad EM120 12 kHz, full-ocean depth multibeam system was used to survey approximately 8,924 km^2 in NORI Area A and approximately 2,911 km^2 in NORI Area B. The Applanix Pos MV 320 V4 system was used to measure vessel position and attitude, and a dual Trimble Zephyr unit was used as the Global Positioning System (GPS) system.

Dredging for bulk nodule sampling was carried out using an epibenthic sled Figure 7.3 that was designed specifically by KC-Denmark Research Equipment for seafloor polymetallic nodules sampling. The dredge in Area A was deployed at 12° 10.2'N, 134° 11.1'W. The dredge in NORI Area B was deployed at 13° 43.5'N, 133° 35.9'W. Approximately 190 kg of nodules were recovered from NORI Area A Figure 7.4 and approximately 85 kg of nodules were recovered from NORI Area B.

Figure 7.3 Photos showing the operation of the epibenthic sled collecting nodules during the NORI 2013 campaign



After each dredge, the nodules were retrieved from the epibenthic sled on the deck of the ship. They were collected in bags and numbered. Each dredge sample was sub-sampled for laboratory analysis using a simple random scoop sampling to obtain two 2 kg samples. During the scooping the size distribution was also considered.

Figure 7.4 Photos of nodules collected from NORI Area A during the NORI 2013 campaign



The four sub-samples from NORI Area A and B were sent to ALS Laboratories in Brisbane for preparation and analysis. The samples were dried at 120 C for 12 hours then assayed using a four-acid digest specifically designed for high-manganese samples, followed by AAS (method Mn-AA62) and four-acid digest followed by ICP-MS for concentrates (ME-MS61c). The Mn-AA62 method has a claimed precision of ±5%. The results for cobalt, copper, iron, manganese, molybdenum, and nickel are included in Table 7.2, and the calculation of weight loss after drying at 120 C for 12 hours (average 28.7%) is included in Table 7.2.

Table 7.1 Assay results for NORI Area A and B nodule samples

ALS assay method code sample	ME-MS61c Co (ppm)	ME-MS61c Cu (ppm)	ME-MS61c Fe (%)	Mn-AA62 Mn (%)	ME-MS61c Mo (ppm)	ME-MS61c Ni (ppm)
NA1	2,250	10,800	5.27	29.0	589	13,600
NA2	2,240	11’ 150	5.06	28.9	545	13,400
NB1	2,490	11,550	5.62	29.2	601	13,800
NB2	2,490	11’ 100	5.60	28.2	590	13,750

ALS = ALS Laboratory Group; Co = cobalt; Cu = copper; Fe = iron; Mn = manganese; Mo = molybdenum; Ni = nickel; ppm = parts per million; % = percent.

Table 7.2 Weight loss of samples after drying

Sample	Wet weight (g)	Dry weight (g)	Loss (%)
NA1	536.8	374.3	30.3
NA2	574.3	396.0	31.0
NB1	616.1	452.5	26.6
NB2	588.3	431.5	26.7

7.3 NORI 2018 campaign

7.3.1 Objectives and approach

During April to June 2018, NORI conducted a successful survey and seabed sampling program in NORI Area D using the OSV *Maersk Launcher*, mobilising out of San Diego (Campaign 3). The work completed is summarised below. Additional information is provided in the Technical Report on NORI Area D, Clarion Clipperton Zone Mineral Resource Estimate, April 2019 (AMC, 2019).

The key objectives of this program were to conduct detailed bathymetric, sonar imaging – MBES backscatter, Side Scan Sonar (SSS), and photogrammetry surveys to help facilitate:

- Identification and selection of enough suitable ground for trials of a collector (the Collector Test).
- Provision of sufficient geological and geotechnical detail to ensure future sampling and Collector Test activities recovery efficiencies can be measured, and that sampling and Collector Test programs are appropriately designed.
- Provision of appropriate seafloor imagery to assist with selection of suitable environmental monitoring sites – particularly for physical oceanographic mooring studies.
- Identification of smaller environmental baseline reference zones. An important consideration is that the habitats of these reference sites are similar in character to the site that will be selected for the Collector Test.
- Demonstration of the methodology to upgrade resource confidence from Inferred to Indicated and Measured categories.

Fugro provided turnkey survey and seabed sampling support for the campaign, including:

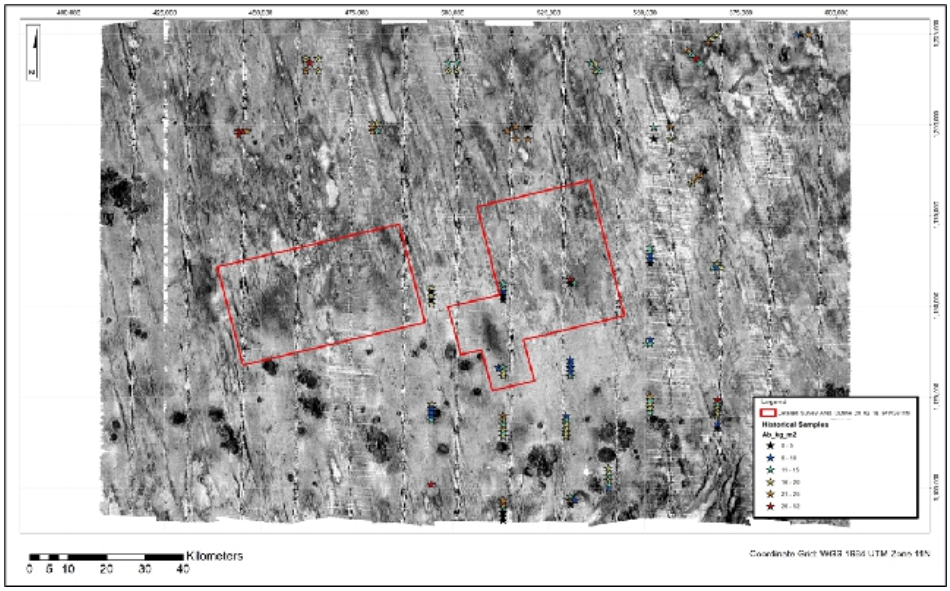
- AUV operational support
- Hydrographic survey support.
- Data processing.
- Geoscience support for AUV survey (data compilation and preliminary data analysis).
- Geoscience support for box coring operations (core logging, nodule processing, geotechnical testing).

Biological sampling support was provided by ERIAS Group environmental consultants.

Data QA/QC, survey design and data interpretation were undertaken by Margin – Marine Geoscience Innovation, as a Client Representative on behalf of NORI.

MBES backscatter data from the 2012 MV Mt Mitchell vessel-based MBES survey was reprocessed using the time-series data. This greatly improved the image quality Figure 7.5 compared to the original beam-averaged data and enabled geological interpretations of the data to be refined. These interpretations provided the foundation for the selection of candidate Collector Test-site targets for follow-up detailed survey by AUV.

Figure 7.5 Reprocessed EM122 backscatter data from NORI Area D 2012 survey



Note: NB – areas designated for AUV detailed survey are shown outlined in red, constituting targets deemed to have high-nodule potential and characterised by dominantly flat-lying topography.

7.3.2 AUV survey

AUV survey methods were identified as the best technological-fit for follow-up investigation at a site-survey scale. An AUV has the capability to provide co-registered multi-sensor datasets at the appropriate resolutions necessary to confidently select the most suitable site for a Collector Trial and provide a framework on which to build associated ongoing engineering and environmental studies.

Fugro's ESVII 4500 m-rated Kongsberg Hugin AUV was used to conduct the detailed survey work, utilising an MBES, Side Scan Sonar (SSS), Sub-Bottom Profiler (SBP) and camera payload Figure 7.6. The AUV typically navigates using a combination of Inertial Navigation System (INS) housed within the AUV and an acoustic navigation system (Kongsberg HiPAP 501 Ultra Short Base Line (USBL) system) communicating between the AUV and the support vessel. The USBL acoustically tethers the AUV to the support vessel, which follows the AUV during its survey and provides the AUV with navigation corrections to counteract drift in the INS system over time. This mode of operation was used for all reconnaissance mapping with the AUV. For survey of the Collector Test Site, the AUV was positioned within an array of transponders positioned on the seafloor – termed a UTP (Underwater Transponder Protocol) array. This enabled the AUV to be left unaided by the support vessel to compete its survey, whilst the support vessel conducted other work within the exploration license area.

Figure 7.6 Deployment ESVII Kongsberg Hugin AUV from the stern of the *Maersk Launcher*



Source: J. Croucher.

There were four main AUV survey focus areas:

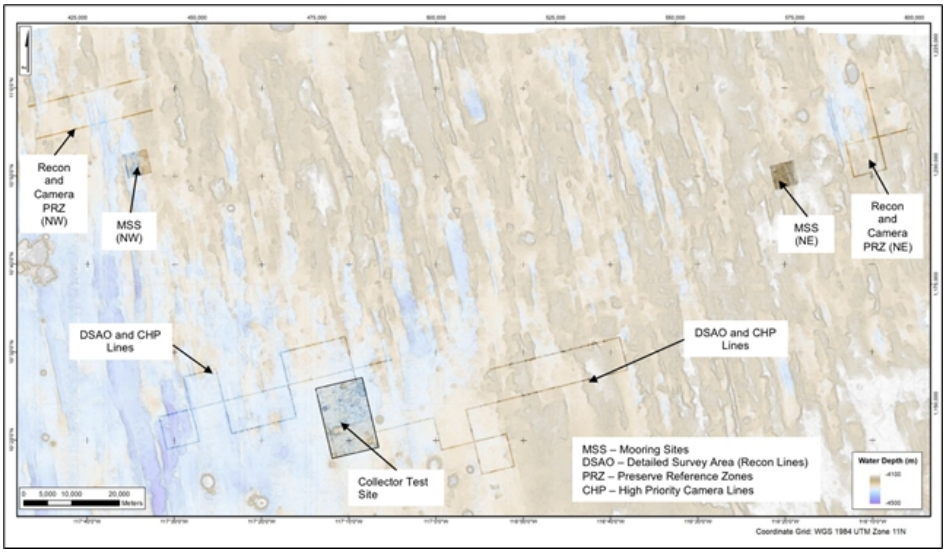
- Reconnaissance lines were collected at a 35 m AUV altitude in order to assess geological and near-surface conditions prior to acquiring low-altitude camera data. These data were also used to select the Collector Test Site location and to assess the designated Preservation Reference Zones within the NORI Area D tenement.
- Camera lines were run at a 6 m AUV altitude in order to map the distribution and abundance of the nodules. These data were also used to select the Collector Test Site location.
- Within the Collector Test Site, data were collected at a 22 m altitude and were used to evaluate geologic and near-surface conditions for future Collector Test activities.
- Within the mooring sites, data were collected at a 90 m altitude and were used to evaluate geologic and near-surface conditions for future mooring locations.

Initial reconnaissance AUV traverses were conducted over the candidate Collector Test Site Figure 7.7 using MBES, SSS and SBP payloads to provide confirmation of topographic and geological features observed in the 2012 vessel-based MBES dataset, but at a higher level of detail and confidence. There was an excellent correlation between the AUV bathymetric data and that collected by hull-based multibeam methods in 2012, providing confidence in both sets of results. These traverses were then followed-up with low-altitude surveys using the AUV's camera payload to provide visual confirmation of nodule distribution.

The reconnaissance traverses were also designed in such as manner as to provide information on nodule continuity (through acquisition of sonar and camera data) between proposed sampling sites on a 7 km rectilinear sampling grid. A key component to the success of the campaign was the ability to conduct box coring simultaneously with the detailed survey by AUV of the selected Collector Test Site, through use of the UTP seafloor acoustic positioning array.

A total of 2286 line km of data was acquired with the AUV, covering an area of approximately 375 km^2 of seafloor. A summary of data types and associated data resolutions collected by the AUV during the 2018 NORI campaign is presented in Table 7.3.

Figure 7.7 AUV geosurvey data acquired during the 2018 NORI campaign



All data acquired by the AUV was processed onboard the vessel to a level where preliminary interpretation could be made on the data by the Fugro Geoscience team and NORI Client Representative onboard. This was key in enabling on-site decision making for follow-up survey optimisation, particularly with regards to selecting the most suitable Collector Test Site.

Table 7.3 Summary of data types collected by the AUV during the 2018 NORI campaign

AUV altitude			**Survey area**							
			90 m		**35 m**			**22 m**	**6 m**	
Sensor	**Data item**	**Details**	**MSS (NE)**	**MSS (NW)**	**DSAO**	**Recon PRZ (NE)**	**Recon PRZ (NW)**	**Test mine site**	**CHP**	**Camera PRZ (NW)**
MBES	Bathy	Bin size	3 m	3 m	1 m	50 cm	50 cm	27 cm	15 cm	15 cm
	Backscatter	Bin size	3 m	3 m	1 m	50 cm	50 cm	15 cm	15 cm	15 cm
Side scan sonar	SSL	Bin size	50 cm	50 cm	50 cm	25 cm	25 cm	27 cm	N/A	N/A
	SSH	Bin size	N/A	N/A	50 cm	25 cm	25 cm	15 cm	N/A	N/A
	SSX	Bin size	N/A	N/A	N/A	N/A	N/A	N/A	7 cm	7 cm
Camera	Orthos	Bin size	N/A	N/A	N/A	N/A	N/A	N/A	3 mm	3 mm
Sub bottom profiler	Sub bottom	Frequency	N/A	N/A	1-10 khz	1-10 khz	1-10 khz	1-10 khz	3.5-20.5 khz	3.5-20.5 khz

Note: MBES operated at 200 or 400 kHz, depending on survey resolution requirements. SSS was operated at 240 kHz, 540 kHz, or 1,600 kHz.

7.3.3 Box coring

Box coring was undertaken using a 0.75 m^2 box corer built by K.C. Denmark A/S, deployed from a H-frame situated amidships of the Maersk Launcher Figure 7.8.

A total of 45 box cores were acquired during the campaign. All box cores were acquired within the detailed survey area on a 7 km square grid Figure 7.9. The sampling grid was designed prior to the mobilisation of the 2018 NORI campaign; therefore, the samples were selected without reference to any of the detailed geophysical data to avoid any bias.

Each box core site was located by positioning the vessel over the proposed box core location and acoustically monitoring the box core's position during descent using the vessel's USBL system communicating with a USBL transponder attached to the box core frame. Once the box core was lowered to approximately 30 m above the seafloor, the surveyor monitored when it was within a 35 m target circle displayed over the proposed target location on the USBL navigation workstation monitor. Once this condition was met, the instruction was given to lower the box core to bottom. Once on bottom a series of position fixes were acquired to solve the on-bottom position. The mean distance between the proposed target location and actual box core position was 18.4 m ±7.9 m.

It is important to note that the hydrographic surveyors guiding the landing out of box cores were only supplied the expected seafloor datum at the proposed core site location. They did not have access to any geophysical data (backscatter, SSS or camera etc.) during these operations. This ensured that the sampling was conducted without any bias.

Once the position fix was taken, the cutting shovel was released to seal and secure the sample and the box corer was winched up off the seafloor. Once the sample was secured on deck, the samples follow three processing paths - environmental, geotechnical, and mineralogy.

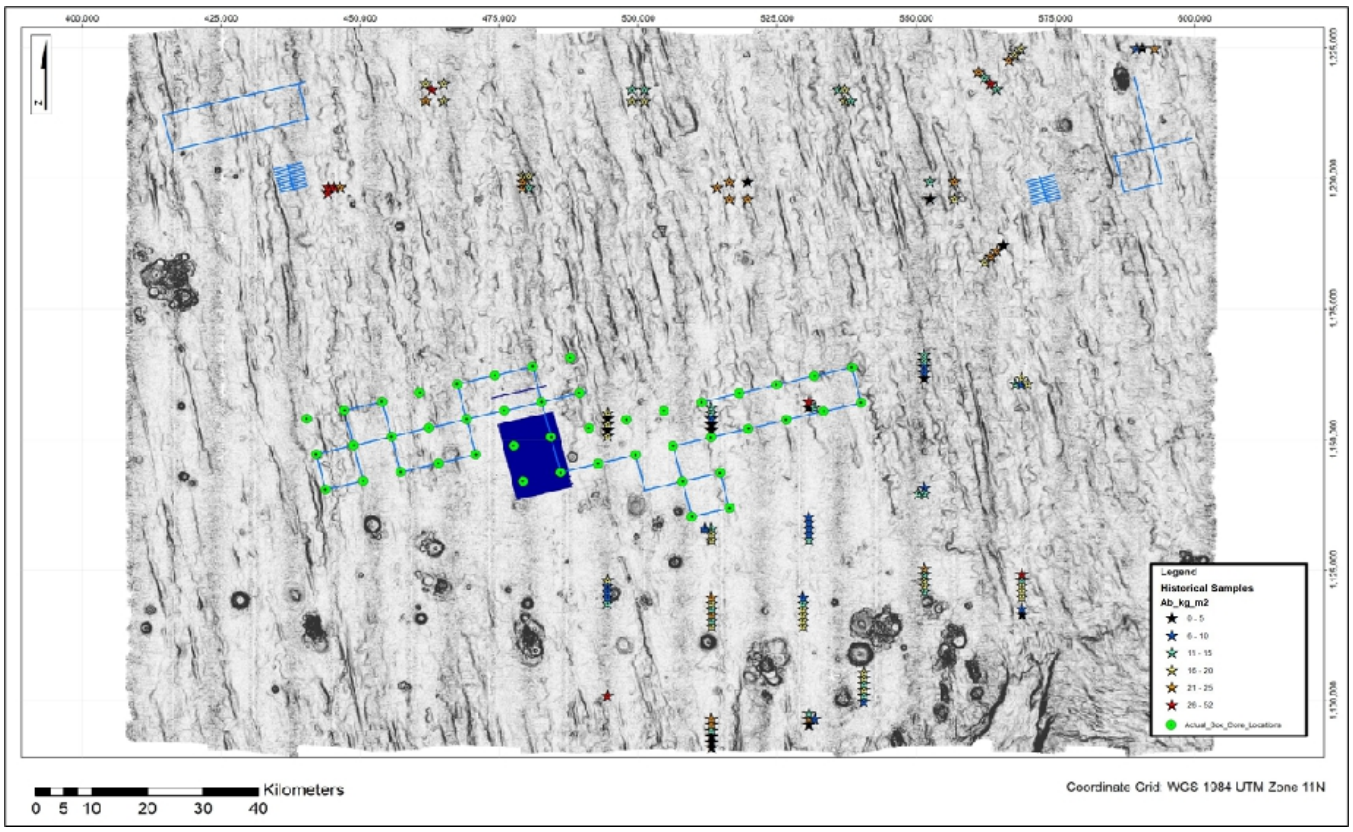
A stand-alone GoPro camera system in a pressure-rated underwater housing and LED lights were attached to the legs of the box corer. This enabled post-recovery analysis of land-outs to be made and comparison of actual box core nodule recovery and in-situ nodule distribution on seafloor.

Figure 7.8 KC Denmark 0.75 m² box corer



Note: Insert top right shows USBL beacon (circled top) and GoPro camera and lighting system (circled bottom).
Source: H. Hughes.

Figure 7.9 Box core locations for 2018 NORI campaign shown by green circles with black centre-dot



Note: Historical sampling shown by stars. NORI 2018 campaign AUV geosurvey traverses shown in blue.

Figure 7.10 shows a sequence of box core land-out footage from the GoPro camera. The top image shows the land out site visual as box core is deployed to seafloor. The middle image shows the box corer in situ on seafloor, before sample is taken (shovel open). The bottom image shows the box corer retracting from seafloor following successful closure of shovel. Loss of the laser-scale early in the campaign meant that nodule measurements could not be accurately measured from the GoPro images.

Figure 7.10 Sequence of box core land-out footage from GoPro camera



7.3.3.1 Sample processing

All samples were processed onboard post-retrieval of a box core sample to deck Figure 7.11. The vessel was equipped with a biology cold laboratory and geoscience laboratory.

Once the box core was landed out on deck and safely secured, the box was separated from the box corer frame. Three processing protocols for environmental, geotechnical, and resource began immediately after collection of each box core. The processing flow on deck was undertaken in the following sequence:

- The top of the sample with the supernatant water still in situ was photographed.
- The water was then carefully siphoned, bailed and / or suctioned off the sample and processed for biological analysis by the biological team onboard.
- The undisturbed surface of the retrieved material (nodule surface) was photographed.
- A 50 × 50 cm area of the retrieved material was cordoned for biological study.
- Three sub-samples were obtained from the undisturbed areas outside of the biology exclusion area for geotechnical purposes. All nodules except for possible buried nodules captured in the 2.638-inch push samples followed the Mineral Resource processing path.
- All surface nodules, when extracted from the box, proceeded to the biology wet laboratory where they were washed with cold seawater through a sieve.
- All buried nodules in the 50 × 50 cm area reserved for biologic sampling also proceeded to the biology wet laboratory. After washing, these nodules were returned to the geology wet laboratory.
- All buried nodules outside of the area of biologic investigation were washed of mud on deck and proceeded to the geology wet laboratory for description, measurement, photography, and sequestration in sample bags within gasket sealed pails.

Figure 7.11 On deck sample processing



Notes:
1. Sample with supernatant water photographed.
2. Water siphoned off for biological processing.
3. Box core with water removed showing GoPro camera mount and 50 × 50 cm frame demarcating area for biological study.
4. Example of GoPro top shot showing nodule distribution.
5. Geotechnical samples being taken.
6. Each layer was excavated for nodules, which were placed in collection trays for further biological processing and mineralogical logging.

7.3.4NORI sampling

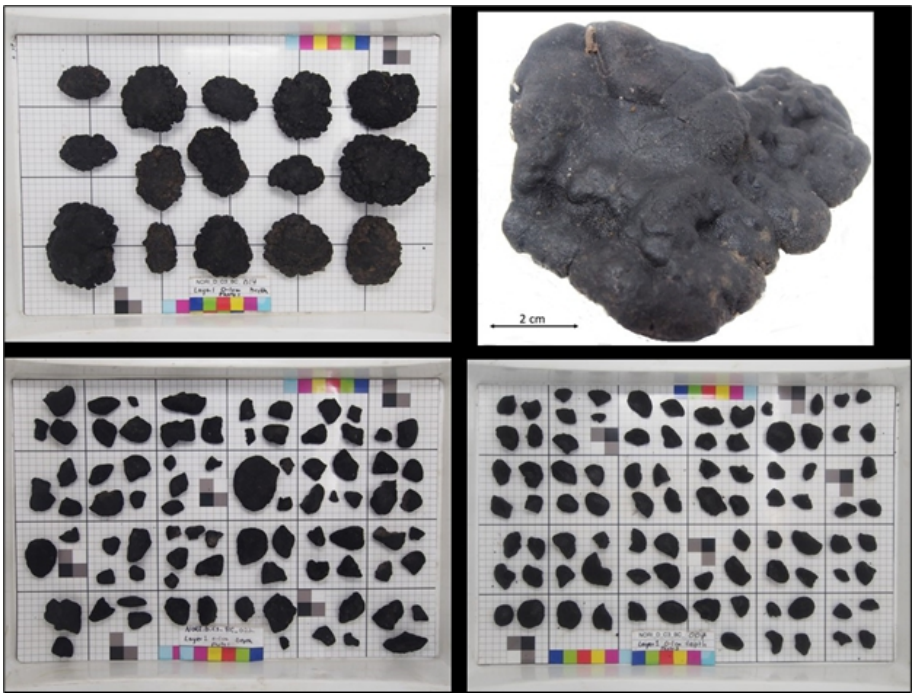
A classification system for nodules was developed by NORI prior to mobilisation to the worksite. This was largely based on guidelines set by the ISA (ISA, 2010) and work presented by TOML in their NI 43-101 resource report (AMC, 2016). Over 49,000 nodules were collected in the 45 box cores. Examples are shown in Figure 7.12. An image classification method was adopted to enable rapid measurement of each nodule for all remaining box core samples. However, descriptors such as shape, texture, and fragmentation were only recorded as the dominant types for each box core sub-sample layer, and not for each nodule.

An average nodule size of 2.95 cm (long axis measurement) was recorded for all samples recovered during the 2018 NORI Campaign. Table 7.4 presents a summary of the size distribution of the nodules within 0–1 cm of seafloor.Shape, texture and fragmentation descriptors were logged as dominant types for each box core layer. Logging was captured in a digital excel database on-board the vessel.

Table 7.4 Nodule size distribution for samples recovered during the 2018 NORI campaign

Long Axis				
<2 cm	2-5 cm			>5 cm
s (small)	sm	m (medium)	ml	l (large)
24%	37%	23%	9%	7%

Figure 7.12 Examples of nodules recovered during the 2018 NORI campaign



Notes: Upper left – example of large nodules with rough texture. Top right – close-up of large nodule. These nodules were the least-dominant size class. More common were nodules in the 2–5 cm range, as shown by examples in lower left and right.

Each box core was sampled by depth interval. Four intervals were used:

- 0–1 cm
- 1–5 cm
- 5–15 cm
- >15 cm

91% of nodules by weight occurred within the top layer and were exposed at seafloor and 99% occurred within the top 15 cm.

Nodules were processed through three stations - a weighing station, volume station and photography station, before division of the nodules into samples and storage in labelled, gasket-sealed 6-gallon pails. All data was collated in a series of Excel spreadsheets.

Samples for distribution to assay laboratories were prepared at sea so that the samples could be sent to their destinations upon demobilisation. The mass of nodules recovered in the box cores was generally much more than required for assaying, so it was necessary to divide the nodules in an unbiased manner, to produce samples for assay and for reference. This was done by the cone and quarter method Figure 7.13. The sampling protocol varied according to the weight of the nodules and is summarised in Table 7.5.

After samples were split, the samples were divided into series of sub-samples for marketing, primary assay, reference, duplicate primary sample and secondary primary sample. These were placed in sealed bags. Each sample was given a unique numbered zip tie placed inside the bag. Bar codes were generated from these unique numbers and adhered to the side of the bag, plus written on the side of the bag in permanent marker pen. Bar codes were linked to the Excel sampling database.

Certified blank samples were purchased from ALS laboratories in Reno, Nevada and inserted into the primary and duplicate sequence at a rate of 1 for every 10. One blank from the primary sequence and one blank in the duplicate sequence was spiked with approximately 50 g of nodules sourced from a marketing split. Certified nodule reference materials were purchased from the United States Geological Survey (USGS) and inserted randomly into the sample stream at the assay laboratory.

All samples were placed in gasket-sealed 6-gallon pails, sealed with tamper-proof tape.

Table 7.5 Sampling protocol

Total nodule weight	Procedure	Primary assay sample	Reference sample (retained)	Duplicate (primary lab)	Duplicate (secondary lab)	Marketing sample
0–4 kg	Crush oversize, cone & quarter. Combine opposite quarters to make two samples.	Yes	Yes	No	No	No
4–8 kg	Crush oversize, cone & quarter. Bag separately.	Yes	Yes	Yes	Yes	No
8–12 kg	Cone and quarter (uncrushed). Retain one quarter for marketing. Recombine the other three quarters and crush oversize, cone & quarter, bag the quarters separately.	Yes	Yes	Yes	Yes	Yes
> 12 kg	As for 8-12 kg, then combine opposite quarters, cone & quarter, bag the quarters separately.	Yes	Yes	Yes	Yes	Yes

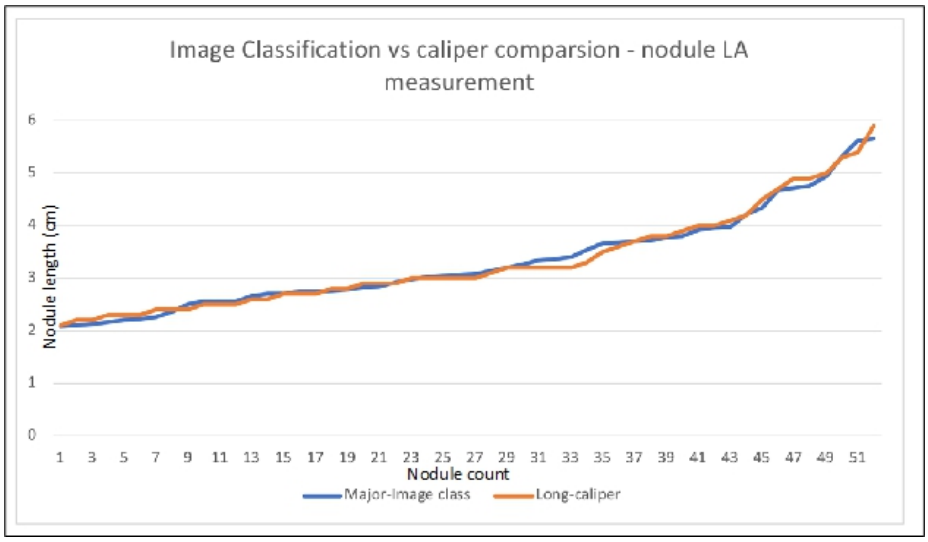
Figure 7.13 Coning and quartering process



7.3.5 Image classification and size measurement

Image classification software was used to provide an alternative automated approach to measurement of nodule dimensions, using photographs. Figure 7.14 presents a comparison between the automated image processing method and hand-held calliper measurements and shows a very good correlation between the two datasets. The average (mean) lengths of the long axes of the nodules using the classification approach and the measured approach were both 3.31 cm. The mean for short axis estimation using the classification approach was 2.68 cm, whilst the mean for the measured approach was 2.72 cm. The test demonstrated that the image classification method was a practical, accurate method for measuring two orthogonal axes of the nodules and it was used from box core BC006 onwards.

Figure 7.14 Comparison of image classifier results vs caliper measurements



7.3.6Biological sampling

The biological sampling was completed in 35 of the box cores Figure 7.15 and consisted of the following:

- 239 nodule biota specimens were sampled.
- 62 megafauna (>2 cm) specimens were sampled.

Samples were placed in cold storage for further analysis once ashore.

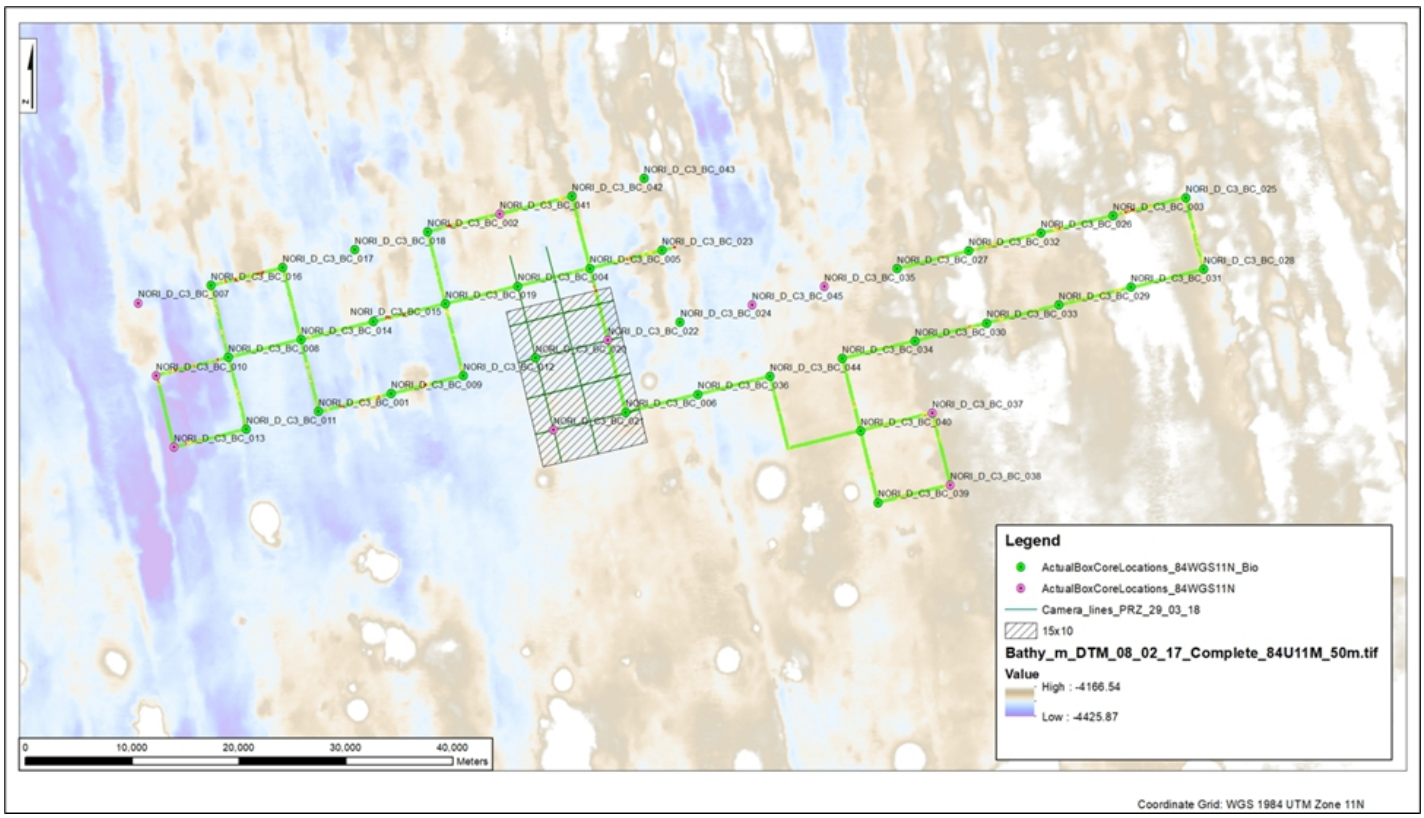
7.3.7Geotechnical sampling

Three soil sub-samples for geotechnical study were obtained from the undisturbed areas of each box core. These consisted of one 2.125 inch inside diameter (ID) liner sampler, and two 2.638 inch ID clear polycarbonate tubes.

The focus of the geotechnical sampling was the clayey footwall sediment sequence. Basic off-shore index and strength laboratory tests, comprised of soil descriptions, wet density measurements, and undrained shear strength index tests (Torvane tests and intact and residual miniature vane tests) were conducted on the geotechnical subsamples obtained from the box cores.

Results from the field tests revealed that the shallow soil stratigraphy consists of a veneer (about 6 cm thick) of surficial, dark brown, very soft semi-liquid clay overlying very soft, dark brown clay to a maximum core penetration depth of about 0.5 m BSF. At about 0.15 m depth, typically, a colour change from dark brown to light brown occurs. Evidence of bioturbation of the light brown layer is indicated by mottling with dark brown and brown clays. It was noted on the high-resolution geophysical survey data that a reflector at about 15 cm to 20 cm depth was consistently present across all the box core sites sampled. This depth corresponds with the top of the light brown clay. Qualitative carbonate content testing typically indicates no reaction with dilute hydrochloric acid (10% concentration).

Figure 7.15 NORI Area D box core locations, showing those with biological sampling (in green)



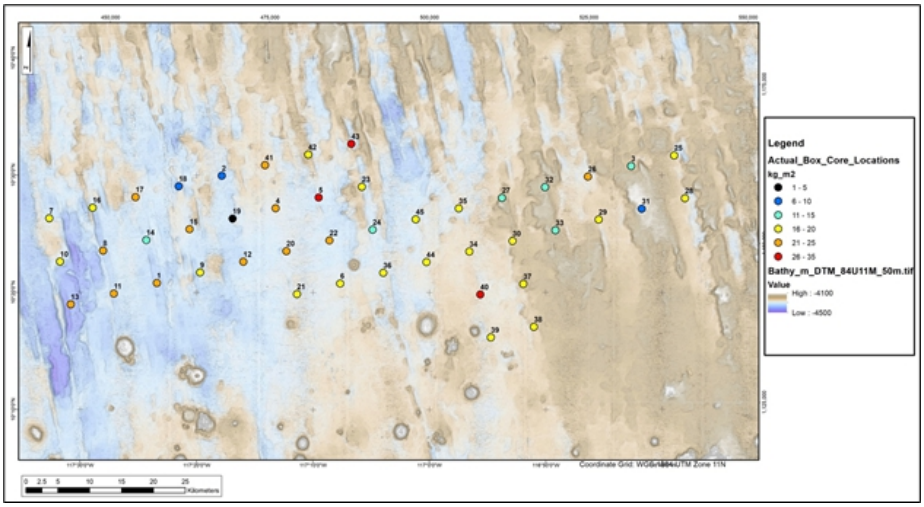
7.3.8Exploration results

The exploration results discussed herein include all data relevant to the Mineral Resource estimate. Additional data was acquired throughout the campaign for the purposes of selecting and mapping a Collector Test Site, environmental Preservation Reference Zones and oceanographic mooring site. These results are not discussed in any detail in this report.

7.3.8.1Box core abundance

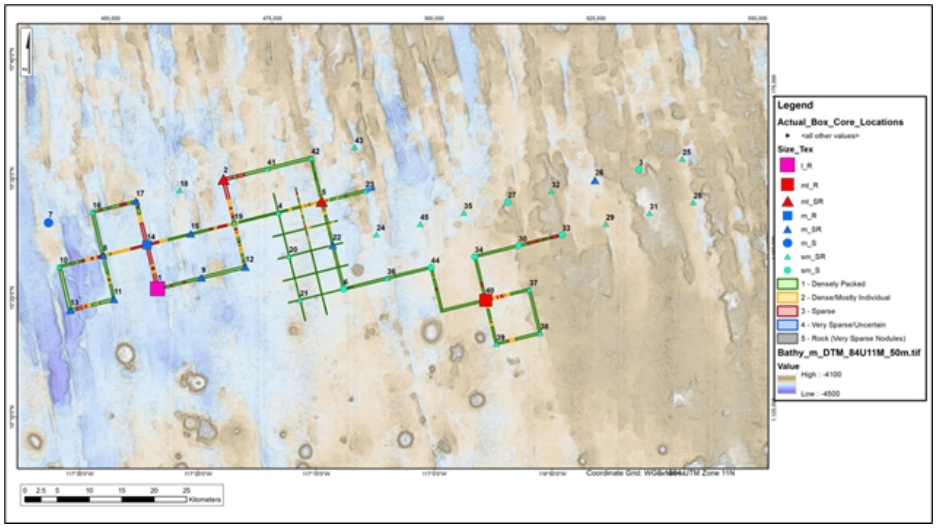
Figure 7.16 shows the spatial distribution of nodule abundance and Figure 7.17 shows the nodule type as per the ISA system outlined in Section 6.6. The box cores had an average nodule abundance of 17.8 kg/m^2, with the highest abundance reported at 30.9 kg/m^2 (BC005). The two lowest recorded abundances are BC019 (0.8 kg/m^2) and BC031 (6.5 kg/m^2).

Figure 7.16 Box core abundance (in kg/m²)



Note: Box cores labelled by box core number.

Figure 7.17 Box core size-texture classification



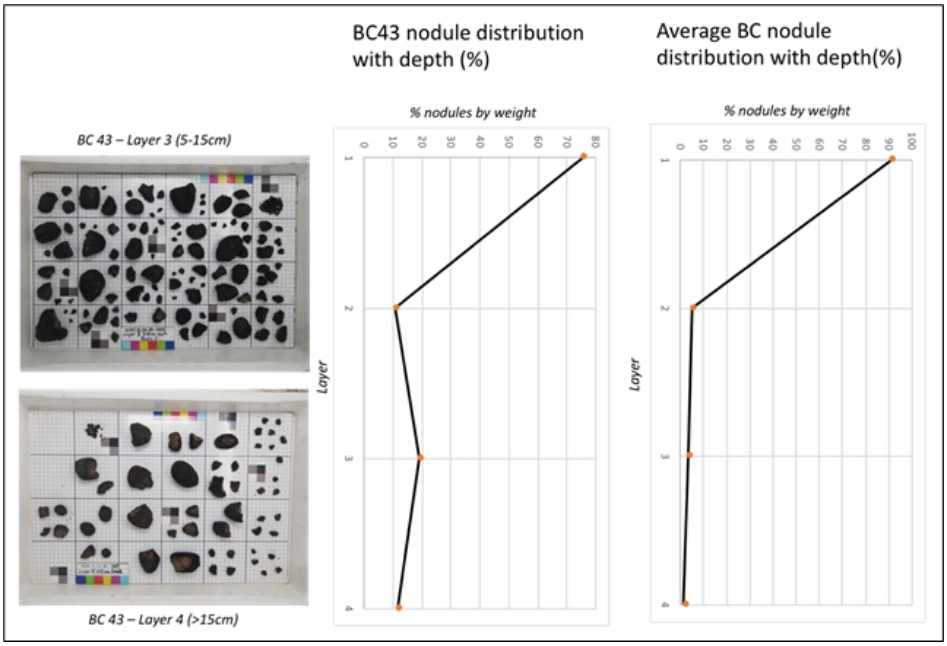
Note: ISA size classification: small (<2 cm), medium (2 – 5 cm), or large (>5 cm) grain size, and texture is smooth (S), smooth-rough (SR), or rough (R). Box cores labelled by box core number.

7.3.8.2 Buried nodules

On average, 91% of nodules by weight were located at 0–1 cm (exposed at seafloor). This is an important consideration as it implies that a representative nodule abundance can be estimated using seafloor camera imagery to map and characterise nodule surficial distribution at seafloor.

Layers 3 and 4 logged in box cores often included a few nodules pushed down deeper from upper layers by the sides of the box core, typified by accumulation along the sidewalls of the box corer. BC043 was an exception and returned a significant weight of in-situ nodules throughout the core at all levels Figure 7.18. The buried nodules were very friable.

Figure 7.18 Profile of nodule weight by depth in BC043



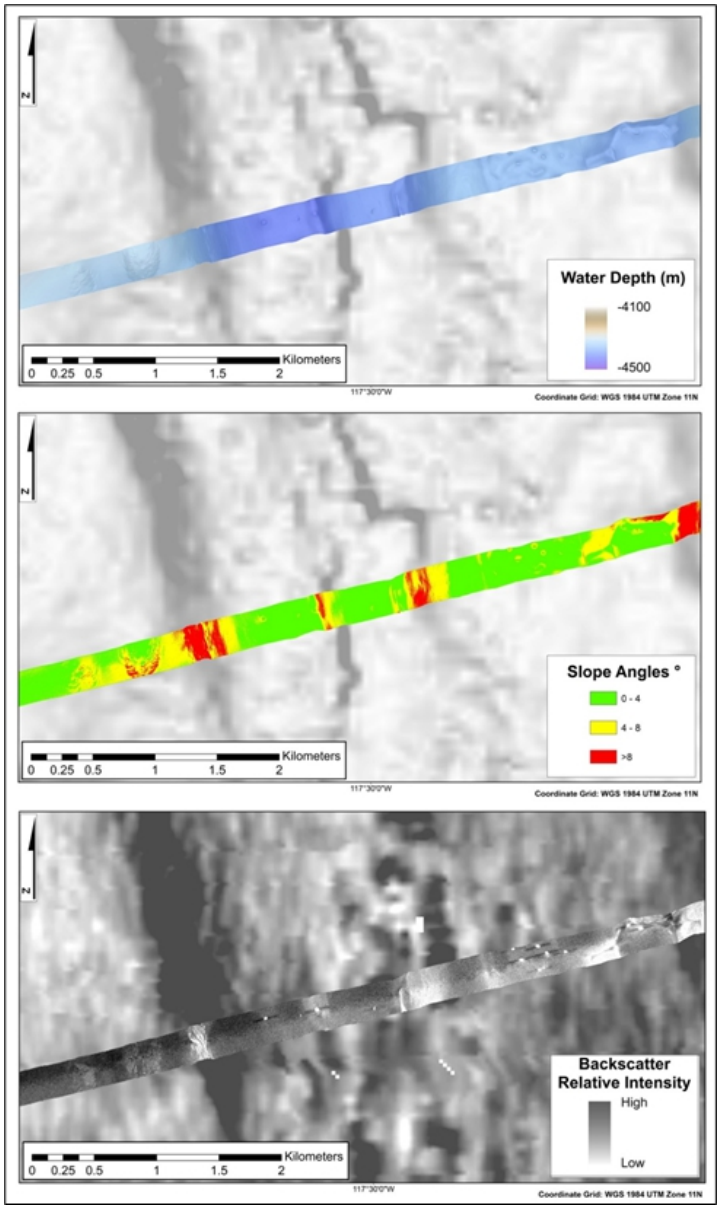
Note: Left – photo trays from layers 3 and 4, centre – nodule distribution with depth for BC43, compared to average nodule distribution with depth for all box cores (right).

7.3.8.3 AUV data

Reconnaissance AUV MBES traverses were conducted over the candidate Collector Test Sites to provide confirmation of topographic and geological features observed in the 2012 vessel-based MBES dataset, but at a higher level of detail and confidence. These traverses were then followed-up with low-altitude surveys using the AUV's camera payload to provide visual confirmation of nodule distribution. The reconnaissance lines also enabled calibration and refinement of the NORI Area D regional geological interpretation. Based on these revised interpretations a geomorphological domain interpretation was developed and preliminary relationships between backscatter and nodule distribution facies observed in camera data were established.

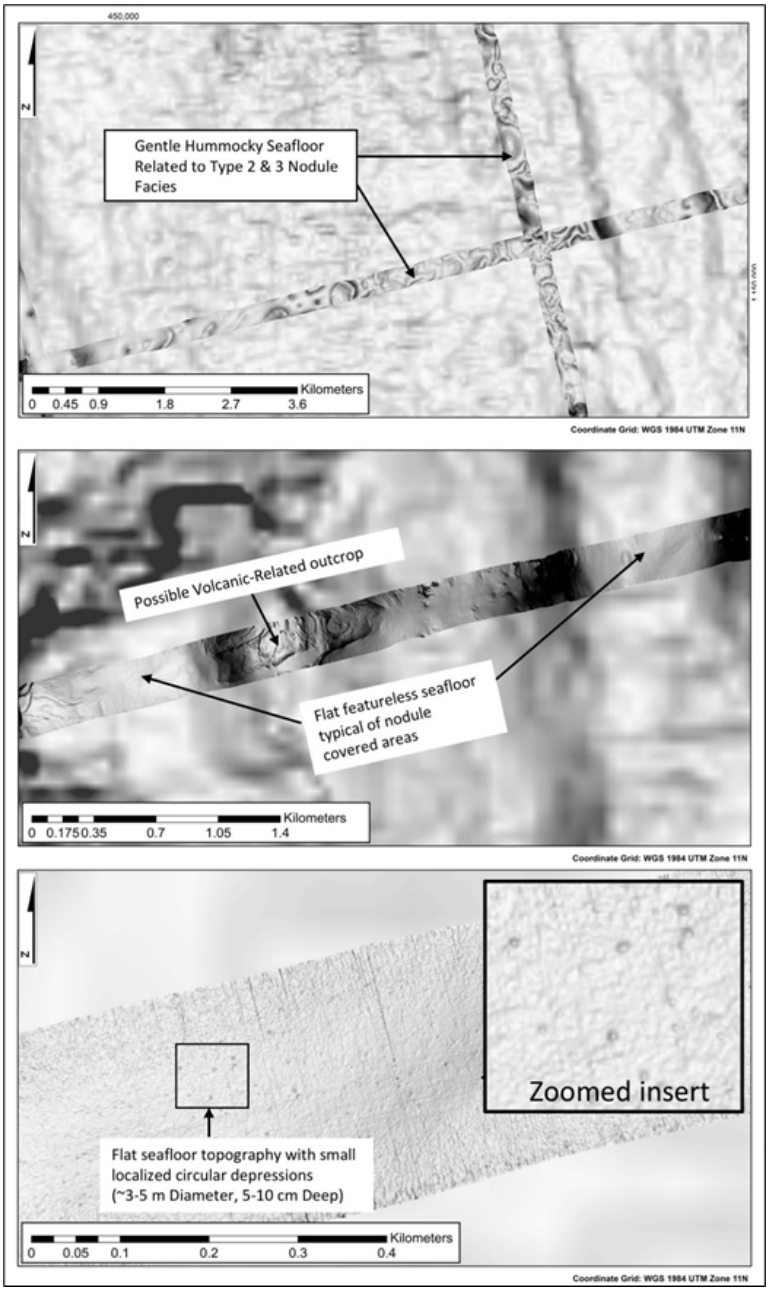
Figure 7.19 shows examples of AUV MBES data (ribbon) from reconnaissance traverses, shown against a background of EM122 vessel-based MBES background. The AUV data provides much finer-scale resolution than vessel-based bathymetry and shows good spatial correlation with macro-features. Figure 7.20 illustrates the fine geological detail provided by the AUV MBES. This type of detailed data will be useful for designing the operating path of the seafloor nodule collectors.

Figure 7.19 Comparison of AUV MBES data (ribbon) against EM122 vessel-based MBES



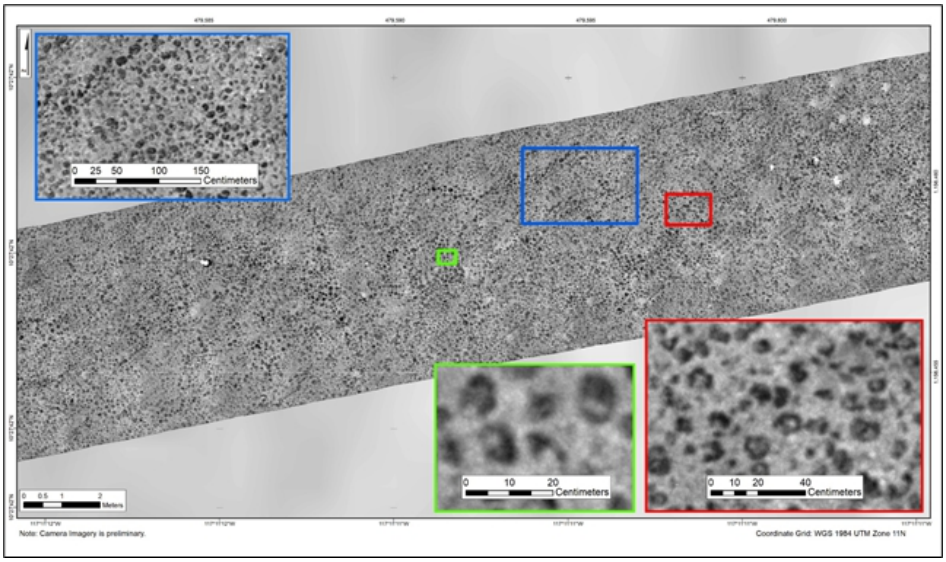
Note: Top – bathymetry; middle – bathymetric slope (hot colours indicate steeper slopes); bottom – backscatter.

Figure 7.20 Examples of AUV MBES data showing detailed-scale geological features



AUV camera data was acquired at 6 m altitude for 89% of the reconnaissance traverses, providing visual continuity of nodule distribution between the majority of the physical box core sample sites. In addition, a 3.5 × 3.5 km grid of camera data was acquired over the Collector Test Site. Camera data is near-continuous over the reconnaissance traverses. Photomosaic coverage along the 3.5 × 3.5 km spaced camera traverses over the selected Collector Test Site are continuous. Each camera frame is 6 m across-track and 4 m along-track. Figure 7.21 provides an example.

Figure 7.21 Example of AUV camera photo mosaic showing nodules



7.3.9 Nodule abundance estimation derived from AUV camera data

Although box coring is an effective method for measuring nodule abundance, it is slow and expensive. Therefore, it is advantageous if box core estimates can be supplemented by an alternative method.

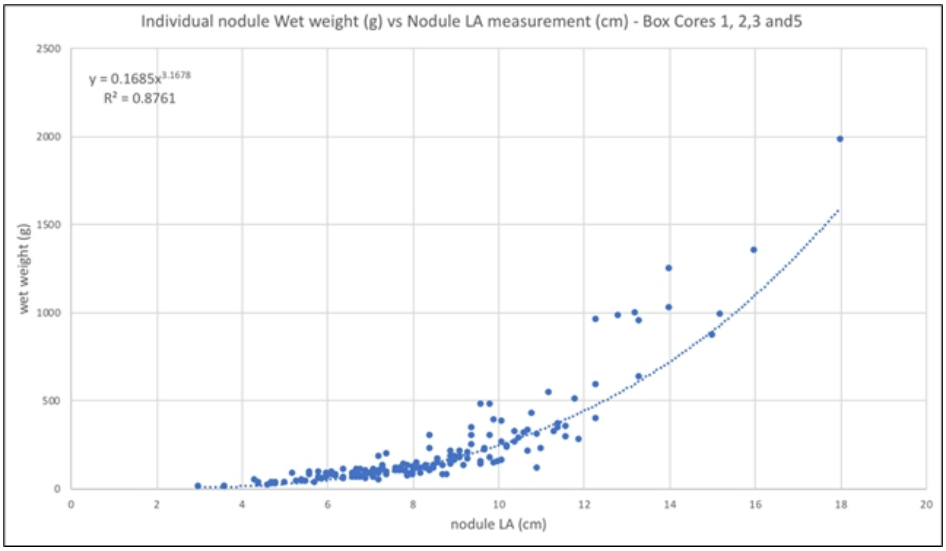
There is a well-documented relationship between nodule length and wet weight
(e.g., Felix, 1980). NORI confirmed this relationship by taking measurements of individual nodule length, using digital callipers, and wet weight, for nodules from box core samples BC001, BC002, BC003, and BC005 Figure 7.22.

In areas where nodules are not closely packed, image processing techniques can be used to identify each nodule unambiguously and measure its dimensions. In this case, it is possible to estimate nodule abundance from photographs. However, if nodules are closely packed and touch each other, image processing techniques are currently unable to reliably discriminate each individual nodule.

Photographic data acquired during the 2018 NORI campaign has shown the dominant nodule distribution in NORI Area D to be closely packed small-to-medium sized nodules (average long-axes length of 2.95 cm), averaging over 900 nodules per box core sample in the surface layer. It is therefore not possible to use image processing and not practical to use manual measurements of long axes for this facies.

Several estimation techniques were tested, and an alternative methodology was developed using a combination of long-axis measurement and percentage nodule coverage which was applied to the data.

Figure 7.22 Comparison of nodule long axis measurements, taken using digital callipers, and individual nodule wet weight for BC001, BC002, BC003, and BC005



A multiple linear regression relationship between percentage nodule coverage estimated from the photographs and mean nodule long-axis measurement from six box core samples within the Collector Test Site was found to provide a good correlation with nodule abundance. The relationship is of the form:

$$Y = -15.20 + (0.24\ X_1) + (5.19\ X_2)$$

Where:

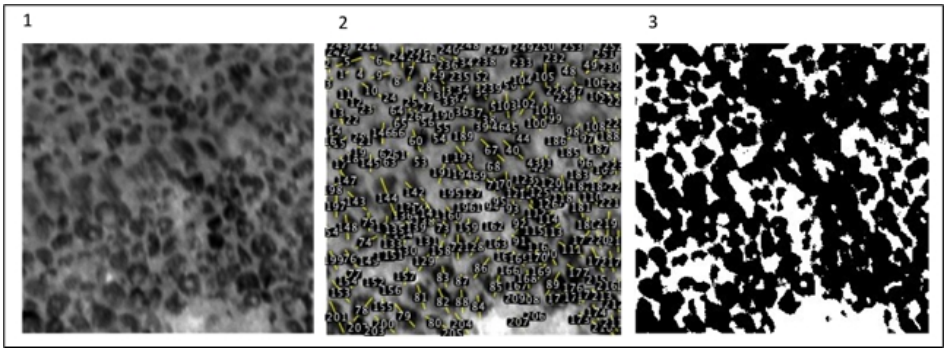
Y is the estimated nodule abundance

X_1 is the percentage nodule cover

X_2 is the mean Long Axis measurement

The percentage nodule coverage was determined by thresholding the image and calculating the percentage area covered by nodules in the image. Nodule long-axes were manually measured where possible, for each nodule in the image Figure 7.23.

Figure 7.23 Detail of image processing



Notes:

1. Camera image.
2. Manual measurement of nodule long axes on calibrated image.
3. Image thresholding to determine percentage nodule coverage.

It was possible to obtain enough measurements to calculate representative mean long axis lengths which compared well with the mean long axis measurements from the actual box core samples Figure 7.24. Because photographs were not taken at the exact box core sites
(due to loss of the camera laser-calibration system mounted on the box corer), 1 × 1 m subsets of the closest calibrated AUV camera data were used for this analysis. The average offset between the camera data and the actual box core site locations was 26 m. The offsets will have introduced some imprecision to the analysis, and it is expected that, in future, collocated photographs and box core samples will produce a better correlation.

Figure 7.24 Comparison of mean long axes lengths from AUV camera imagery and box cores

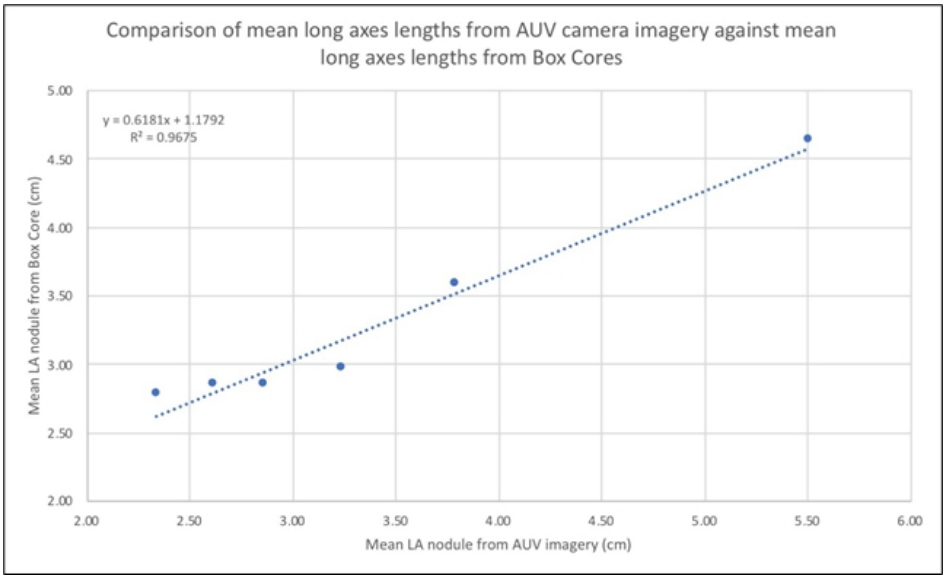
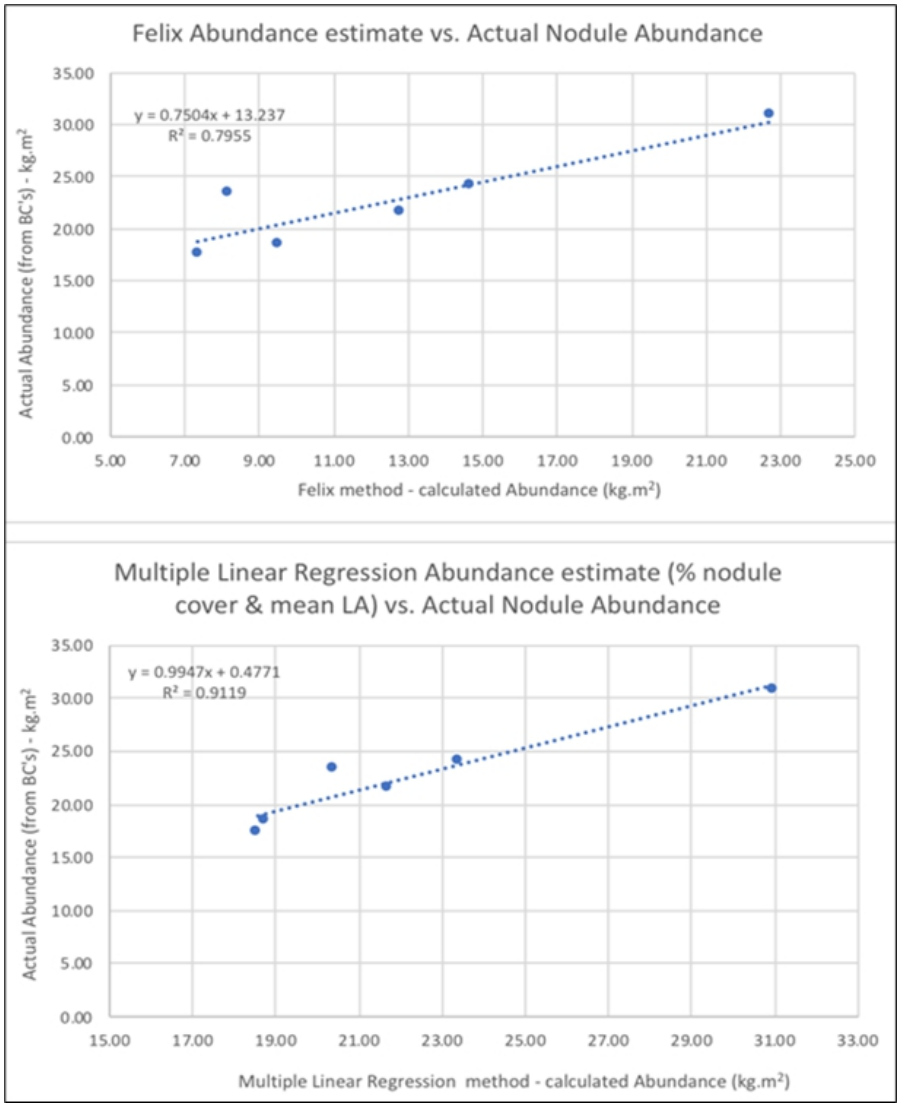


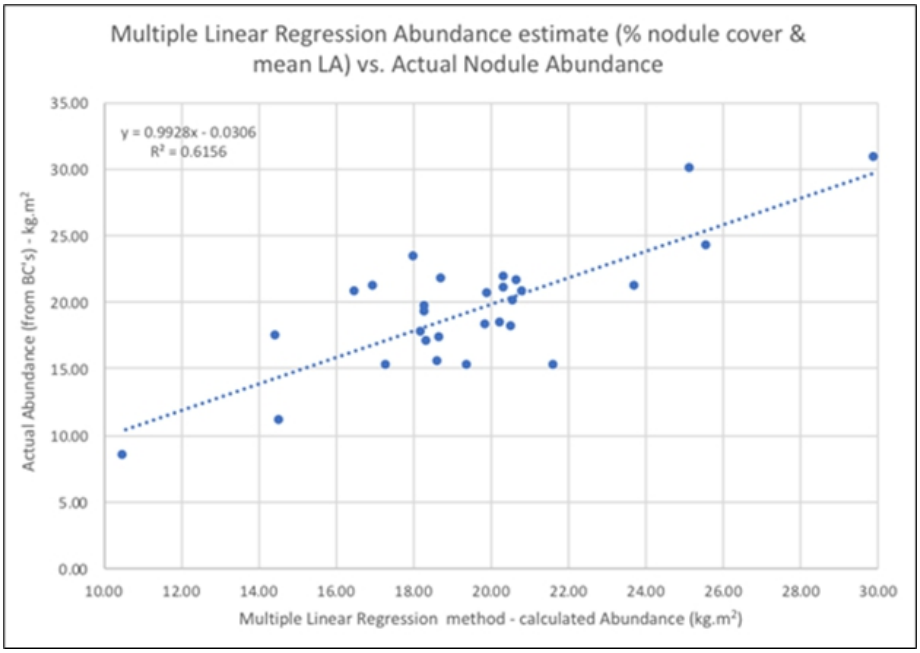
Figure 7.25 shows the estimated abundance vs. actual abundance for Felix method (top), and the multiple linear regression method (bottom) for six box cores in the Collector Test Site. Although the correlation is high for the Felix method, the multiple linear regression method provided a better correlation than the Felix method and estimates that are closer to the actual nodule abundances. This is because the method is not dependent on measurement of each-and-every nodule in the image, which is not possible with some of the images typical of Type 1 nodule facies.

Figure 7.25 Comparison of Felix method and multiple linear regression method



The multiple linear regression method was subsequently applied to the entire box core data set with associated AUV camera imagery (a total of 29 box cores used) to derive a more representative relationship using all available data. Extracted camera imagery was within an average offset of 15 m from actual box core site locations. The results are shown in Figure 7.26. An acceptable correlation (with an R^2 coefficient of 0.62) was obtained.

Figure 7.26 Multiple linear regression model for nodule abundance



AUV camera transects were acquired on a 3.5 × 3.5 km grid pattern over the Collector Test Site. Subsets (1 × 1 m) of AUV camera data were extracted for each intersection point of the survey lines and the percentage nodule coverage was extracted as per the methods outlined above. Mean nodule long axis measurements were manually extracted from these images. This was necessary, as the majority of these extraction points are situated in Type 1 nodule facies, which were therefore not suited to the automated nodule detection method. Nodule abundance estimates were then derived for each of these intersection points, resulting in a 3.5 × 3.5 km grid of nodule estimation points over the Collector Test Site Figure 7.27. These estimates were used to supplement the Mineral Resource estimate.

Figure 7.27 Nodule abundance estimates at 3.5 × 3.5 km node spacing within the Collector Test Site



7.4 NORI 2019 campaign

Exploration in 2019 was divided into two campaigns (6A and 6B) due to the maximum duration of 45 days that OSV Maersk Launcher can remain out at sea. Campaign 6A was undertaken from 19/08/2019 to 03/10/2019 and Campaign 6B was undertaken from 10/11/2019 to 21/12/2019. The vessel was mobilised out of San Diego, California, USA.

Leap Energy was sub-contracted to provide geological support for the box coring operations. Bluefield Geoservices was subcontracted to provide the geotechnical logging and testing component of the programme, and ERIAS was sub-contracted to undertake environmental biological of the box cores.

7.4.1 Box coring

A 100 x 75 x 50 cm stainless steel box corer built by KC Denmark, and a Kongsberg Maritime HiPAP 501 Ultra Short Base Line (USBL) system were used for the sampling campaigns. The box corer was operated by an MSS marine crew and was fitted with a large Kongsberg USBL beacon for positioning Figure 7.28 and a sound velocity profiler (SVP) to monitor sound velocity variations in the water column. The positioning was monitored by two certified surveyors from the Leap Energy team. Fixes were taken during each box core landing and all sample coordinates were recorded in WGS84 UTM 11N.

Figure 7.28 Box corer on deck showing the USBL beacon mounting position



The procedures for sampling the nodules in Campaigns 6A and 6B were essentially the same as in 2018, with only minor changes in workflow to improve the efficiency of the process. The main changes were that the sampling intervals were simplified 0–1 cm, 1–15 cm, and the samples were not coned and quartered onboard the vessel. A flow chart of the sampling procedure is provided in Figure 7.29.

7.4.2 Nodule sampling

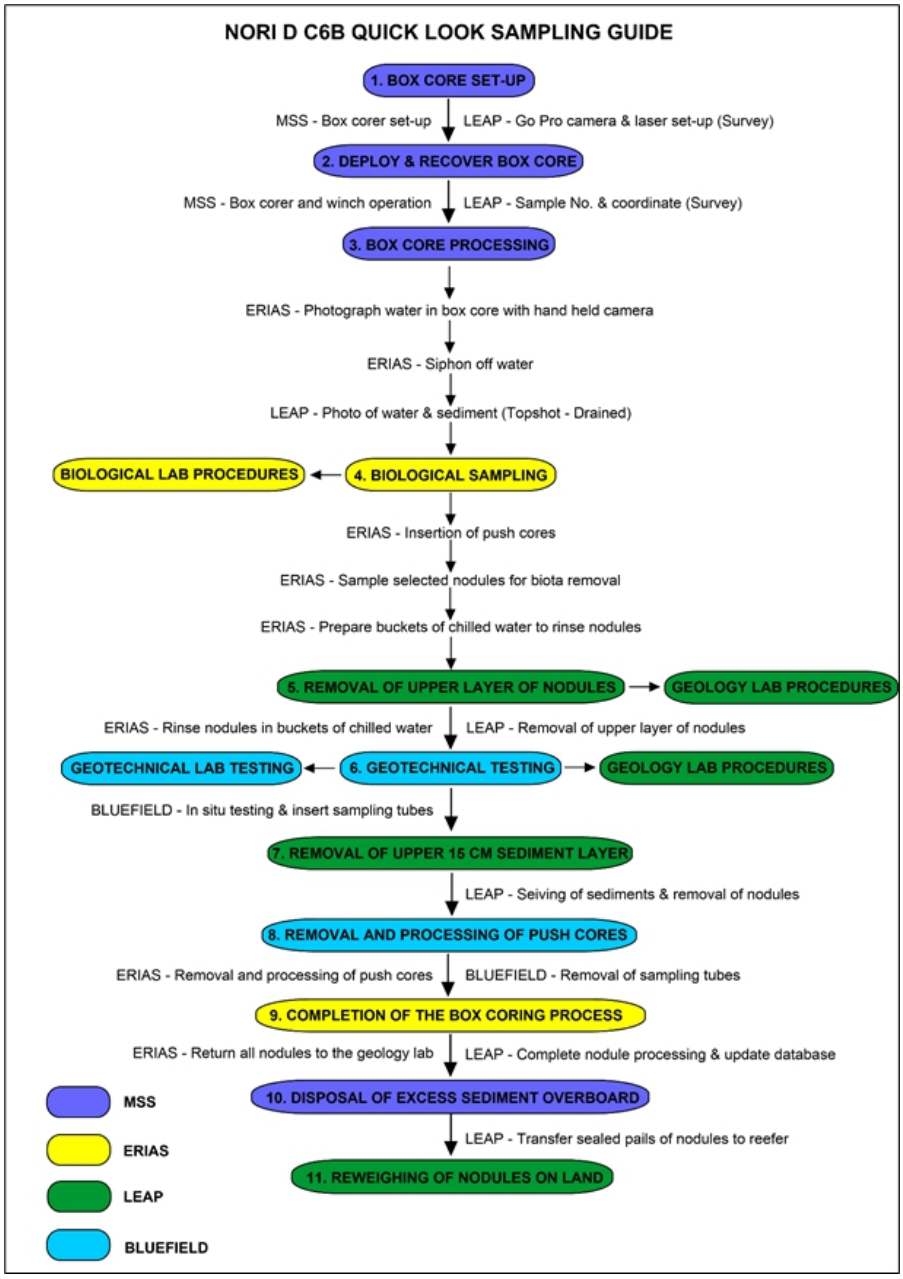
The dominant nodule shape, texture, degree of fragmentation, degree of botryoidal development together with the samples weight and nodule abundance was logged. The nodule facies classification system developed during the 2018 campaign was used. For the clay footwall succession, the sediment lithology and colour were recorded.

The dominant nodule facies in the NORI Area D license area for the samples recovered during Campaigns 6A and B was Type 1 (82%).

The nodule description and measurement procedures were the same as used in 2018.

Sample preparation procedures were the same as used in 2018, with the exception that they were coned and quartered at the on-shore laboratory, rather than onboard the vessel.

Figure 7.29 Box core processing flow sheet for Campaign 6B



Note for Campaign 6A the processing flow was similar, with the absence of biological push-cores.

7.4.3 Biological sampling

Biological sampling involved the collection of specimens of mega, macro, meio and microfauna from the samples of nodules and underlying sediments collected in the box cores during the 2019 campaigns. Specimens of biota were collected from a number of horizons in the box core sample, including sieving of the water layer overlying the sediments to collect motile specimens; physical removal of specimens of megafauna from sediment and attached to nodules and preserving them for later analysis; washing nodules to dislodge macro fauna; and using cores pushed into the sediment to collect meio and macro fauna from different sediment horizons. Sediment samples were also retained and preserved for environmental DNA (eDNA) analysis.

Biological material was collected and preserved from 100 box cores during Campaign 6A adding to the samples collected from 45 box cores during Campaign 3. All the samples and specimens collected during the campaigns have been appropriately preserved and are stored for identification and analysis at a later date.

Marine mammal observations were made from the bridge of the vessel and logged in a data base.

7.4.4 Geotechnical sampling

Bluefield Geoservices performed geotechnical testing on 206 box core samples to a maximum depth of 0.50 m below sea floor. These were performed as part of the work-flow once the box cores were landed out on deck. All samples were subject to cone penetrometer testing and a subset of samples were subject to a comprehensive series of tests, including shear vane and plate load tests, using a purpose-built geotechnical rig provided by Bluefield Geoservices. Coring and geotechnical logging were also completed off-shore. Three (3) push cores collected from each box core for laboratory analysis. A comprehensive campaign of laboratory testing was also undertaken.

The soils encountered were very soft clays. Off-shore geotechnical analysis consisted of cone penetration test (CPT), laboratory vane, Torvane and plate load testing Figure 7.30. Push core and bulk density samples were taken from the box core opportunistically to aid sample description. Samples were also collected for subsequent on-shore laboratory testing Figure 7.31. In addition, eight (8) gravity cores were collected.

Figure 7.30 Photographs of geotechnical plate load test (left) and CPT (Right)

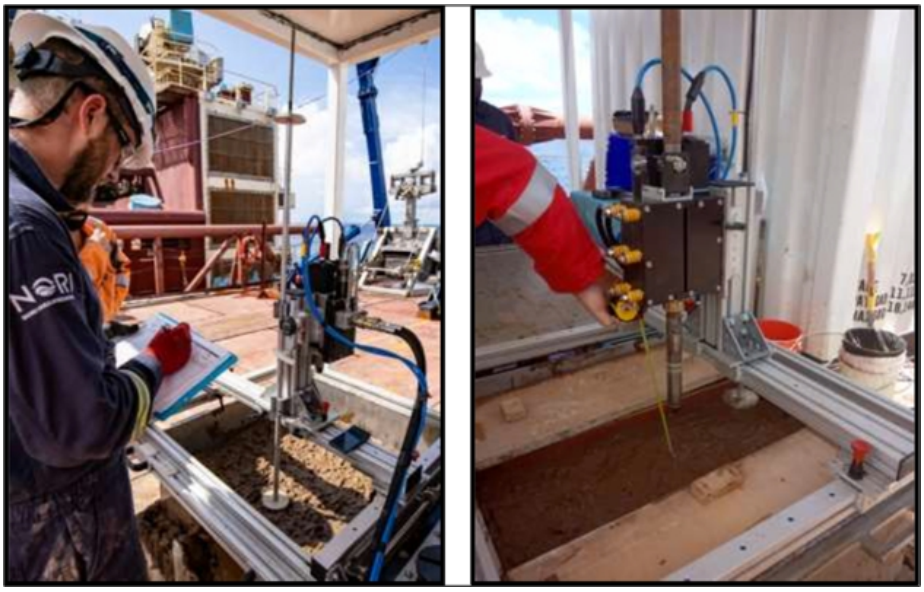


Figure 7.31 Photographs of biological & geotechnical tube sampling



7.4.5 Exploration results

Box core sampling was attempted at a total of 106 sites in the NORI Area D license area during Campaign 6A and 107 sites during Campaign 6B. Disturbed samples, considered to be unreliable, were omitted from the sample sequence.

A total of 106 box cores (BC046–BC151) and four gravity cores were acquired in the NORI Area D license area during Campaign 6A and 101 box cores (BC176–BC280) and four gravity cores were acquired during Campaign 6B. Disturbed samples, considered to be unreliable, were omitted from the sample sequence. Table 7.6 lists box core sample coordinates and polymetallic nodule weights and Figure 7.32 shows the location of the box cores.

The majority of the polymetallic nodules (92%) were found on the sediment surface
(0 cm to 1 cm interval), with the remainder being predominantly encountered buried in the sediment at depths between of 1 cm and 15 cm. Occasionally, nodules were found buried deeper in the box core (15 cm to 30 cm), but these were generally in advanced stages of breakdown and were very easily broken when any attempt was made to recover them. The nodules from the deeper sedimentary layers (15 cm to 30 cm) were noted but were not collected or processed along with the nodule samples destined for the assay laboratory.

The nodules collected during the sampling campaign ranged in size from 10 mm to 250 mm in diameter. The dominant nodule shape encountered were discoidal in shape, whilst polynucleic shaped nodules were confined to the smaller Type 1 nodules.

The soils encountered in the box cores generally consisted of a lower sedimentary unit of very soft, pale brown clay, becoming dark brown with depth, and showing evidence of bioturbation.

The two sampling campaigns returned similar average nodule abundances, with the NORI_D_C6A campaign at 18.1 kg/m^2 and the NORI_D_C6B campaign at 17.0 kg/m^2. In general, nodule abundance is higher in the north and west of NORI Area D and diminishes towards the southeast. Topographic or geological controls may control nodule type/nodule facies on a more local scale.

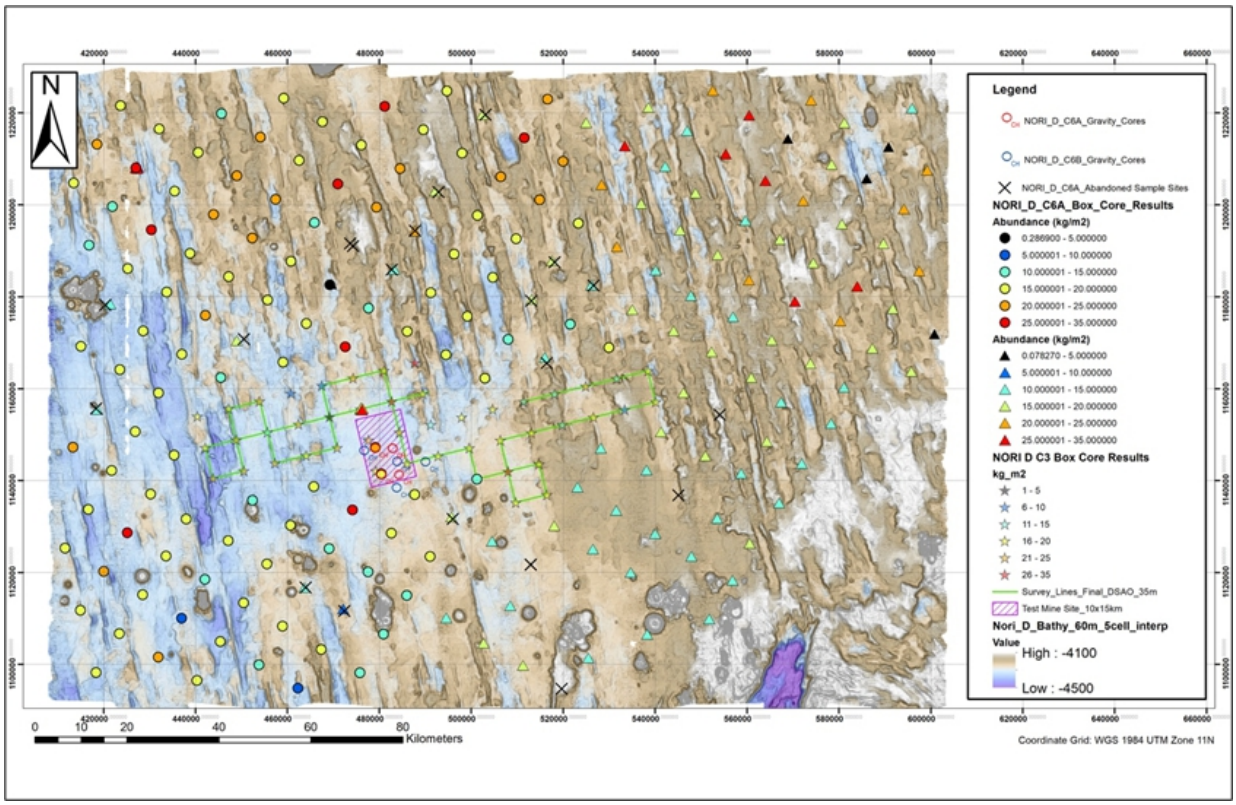
Table 7.6 Box core sample coordinates and polymetallic nodule weights

Box Core Number	Campaign	Actual Location		Weight (kg)		Abundance (kg/m2)		Nodule Facies
		Easting (E)	Northing (N)	Offshore (kg)	Onshore (kg)	Offshore	Onshore	
046	6A	516607.65	1222981.94	16.02556	16.0642	21.37	21.42	1
047	6A	494699.86	1224747.78	13.78932	13.891	18.39	18.52	1
048	6A	511534.73	1214549.64	23.9472	24.0276	31.93	32.04	2
049	6A	519947.78	1209474.13	16.62136	16.604	22.16	22.14	1
050	6A	523284.31	1195972.15	11.88762	11.842	15.85	15.79	1
051	6A	514872.31	1201070.85	17.10605	17.0536	22.81	22.74	2
052	6A	506434.69	1206129.37	15.71338	15.6634	20.95	20.88	2
053	6A	498012.48	1211234.86	12.26207	12.2216	16.35	16.30	1
054	6A	489587.78	1216348.68	14.2689	14.2255	19.03	18.97	1
055	6A	481141.59	1221418.01	22.27297	22.3188	29.70	29.76	3
056	6A	459186.71	1223177.39	14.00777	13.945	18.68	18.59	1
057	6A	467625.44	1218090.78	13.5955	13.5602	18.13	18.08	1
058	6A	476068.70	1212995.08	11.80235	11.7452	15.74	15.66	1
059	6A	484494.43	1207897.25	16.26776	16.2132	21.69	21.62	1
060	6A	501354.11	1197701.54	14.59081	14.522	19.45	19.36	1
061	6A	509744.18	1192623.25	14.17769	13.7906	18.90	18.39	3
062	6A	529959.77	1168937.39	11.92477	11.9114	15.90	15.88	1
063	6A	521539.08	1174008.22	11.18427	11.1644	14.91	14.89	1
064	6A	504687.57	1184187.24	11.99619	11.9978	15.99	16.00	2
065	6A	496247.62	1189262.13	12.86045	12.8506	17.15	17.13	1
066	6A	479387.41	1199464.57	16.49672	16.4812	22.00	21.97	1
067	6A	470959.14	1204558.24	18.9512	18.947	25.27	25.26	2
068	6A	462522.78	1209648.28	13.16105	13.1526	17.55	17.54	1
069	6A	454099.31	1214738.71	17.5744	17.5698	23.43	23.43	2
070	6A	445655.22	1219855.64	10.34846	10.3302	13.80	13.77	1
071	6A	423700.42	1221601.55	11.30465	11.283	15.07	15.04	1
072	6A	432117.69	1216503.17	13.69547	13.674	18.26	18.23	1
073	6A	440560.66	1211410.19	12.90316	12.9	17.20	17.20	1
074	6A	448984.92	1206313.30	17.04071	17.0428	22.72	22.72	1
075	6A	457429.71	1201201.58	17.31903	17.3008	23.09	23.07	2
076	6A	465872.41	1196137.90	10.49147	10.424	13.99	13.90	3
077	6A	491182.38	1180846.76	14.74507	14.7456	19.66	19.66	1
078	6A	499123.23	1175721.79	14.2055	14.1934	18.94	18.92	1
079	6A	508024.00	1170680.10	10.85474	10.8406	14.47	14.45	1
080	6A	502935.60	1162237.17	11.64862	11.6512	15.53	15.53	1
081	6A	494488.51	1167334.36	14.57712	14.5718	19.44	19.43	1
082	6A	486070.94	1172431.49	14.53504	14.5266	19.38	19.37	1
083	6A	477643.41	1177492.78	11.09514	11.0816	14.79	14.78	1
084	6A	469212.18	1182594.20	0.22081	0.2152	0.29	0.29	3
085	6A	460772.24	1187696.49	12.0924	12.0718	16.12	16.10	1
086	6A	452336.33	1192782.56	16.59518	16.5884	22.13	22.12	1
087	6A	443900.13	1197890.45	16.30036	16.295	21.73	21.73	1
088	6A	435462.90	1202979.23	14.60069	14.4481	19.47	19.26	2
089	6A	427028.99	1208062.11	22.62526	22.3786	30.17	29.84	2
090	6A	418571.39	1213165.55	16.29064	16.2818	21.72	21.71	1
091	6A	413487.58	1204727.92	12.08875	12.0572	16.12	16.08	1
092	6A	421917.19	1199644.93	11.26413	11.237	15.02	14.98	1
093	6A	430365.98	1194549.71	22.07454	22.0586	29.43	29.41	2
094	6A	438798.78	1189430.79	12.82568	12.7992	17.10	17.07	1
095	6A	447230.62	1184361.20	13.48456	13.473	17.98	17.96	1
096	6A	455676.00	1179261.70	14.37345	14.3573	19.16	19.14	1
097	6A	464120.48	1174172.38	14.42651	14.4194	19.24	19.23	1
098	6A	472559.36	1169073.14	21.51717	21.3622	28.69	28.48	3
099	6A	459028.38	1165736.53	12.43137	12.3634	16.58	16.48	3
100	6A	442142.17	1175923.18	16.18182	16.168	21.58	21.56	1
101	6A	433707.25	1181010.15	12.45181	12.4348	16.60	16.58	1
102	6A	425252.79	1186103.71	12.98788	12.9608	17.32	17.28	1
103	6A	416833.40	1191215.07	11.2295	11.203	14.97	14.94	1
104	6A	428607.47	1172556.05	12.33715	12.3134	16.45	16.42	1
105	6A	437046.52	1167487.01	14.63293	14.614	19.51	19.49	1
106	6A	445500.53	1162398.24	8.57768	8.5522	11.44	11.40	1
107	6A	431972.50	1159031.23	11.92446	11.9074	15.90	15.88	1
108	6A	423515.81	1164114.75	12.42569	12.3972	16.57	16.53	1
109	6A	415075.99	1169212.06	13.13595	13.1134	17.51	17.48	1
110	6A	426873.12	1150607.91	12.73691	12.7186	16.98	16.96	1
111	6A	435327.90	1145511.28	12.14001	12.1106	16.19	16.15	1
112	6A	430226.54	1137045.40	12.63216	12.5962	16.84	16.79	1
113	6A	437965.37	1131586.20	12.29276	12.2552	16.39	16.34	1

Box Core Number	Campaign	Actual Location		Weight (kg)		Abundance (kg/m2)		Nodule Facies
		Easting (E)	Northing (N)	Offshore (kg)	Onshore (kg)	Offshore	Onshore	
114	6A	479116.50	11471632.2	15.95706	15.9884	21.28	21.32	1
115	6A	480444.37	11414344.5	11.41333	11.4294	15.22	15.24	1
116	6A	421777.08	11421523.8	12.06031	12.0862	16.08	16.11	1
117	6A	413318.88	11472285.1	16.52079	16.5528	22.03	22.07	1
118	6A	416702.07	11333703.3	13.72593	13.7608	18.30	18.35	1
119	6A	411614.90	11252563.7	12.21826	12.222	16.29	16.30	1
120	6A	414967.55	11117248.2	12.72899	12.7548	16.97	17.01	1
121	6A	420050.48	11201693.2	15.10089	15.1248	20.13	20.17	1
122	6A	425138.06	11286173.2	19.61851	19.6562	26.16	26.21	2
123	6A	433585.66	11235454.6	13.17885	13.203	17.57	17.60	1
124	6A	428507.42	11150956.4	11.919	11.9486	15.89	15.93	1
125	6A	423436.54	11066290.6	13.3223	13.336	17.76	17.78	1
126	6A	418331.13	10981774.4	13.47486	13.59	17.97	18.12	3
127	6A	431877.82	11015470.8	15.19952	15.1348	20.27	20.18	3
128	6A	436945.09	11099985.7	6.91858	6.91	9.22	9.21	3
129	6A	442029.06	11184481.0	8.43266	8.445	11.24	11.26	1
130	6A	447096.97	11268749.2	14.87212	14.8974	19.83	19.86	1
131	6A	452375.98	11356556.6	10.19886	10.2194	13.60	13.63	1
132	6A	465726.38	11386729.4	13.98023	14.0094	18.64	18.68	1
133	6A	460643.69	11302532.4	12.70846	12.7284	16.94	16.97	1
134	6A	455543.23	11218159.8	12.89784	12.9402	17.20	17.25	1
135	6A	450465.49	11133527.4	14.05746	14.0842	18.74	18.78	2
136	6A	445381.03	11049063.2	13.45611	13.4854	17.94	17.98	1
137	6A	440298.77	10964613.5	14.18014	14.208	18.91	18.94	1
138	6A	453831.90	10998841.4	10.87809	10.8968	14.50	14.53	1
139	6A	458910.51	11082718.1	14.7575	14.7822	19.68	19.71	1
140	6A	469079.49	11251458.0	9.44779	9.4656	12.60	12.62	1
141	6A	474166.09	11335807.1	21.84486	21.8806	29.13	29.17	1
142	6A	487678.37	11369313.7	14.11873	14.1478	18.83	18.86	1
143	6A	482613.51	11285140.0	13.49911	13.5304	18.00	18.04	1
144	6A	477520.76	11200668.7	9.59831	9.6198	12.80	12.83	1
145	6A	467366.44	11032105.4	12.54903	12.585	16.73	16.78	1
146	6A	462269.37	10947532.5	5.83656	5.8444	7.78	7.79	3
147	6A	475793.37	10981048.1	10.64722	10.6652	14.20	14.22	1
148	6A	480870.43	11065638.3	9.56179	9.5776	12.75	12.77	1
149	6A	485963.55	11149797.3	10.78484	10.8058	14.38	14.41	1
150	6A	491042.63	11234148.4	13.29108	13.317	17.72	17.76	1
151	6A	501214.83	11402829.1	10.38492	10.4166	13.85	13.89	1
176	6B	502418.14	12195827.0	11.54004	13.72970	15.39	18.31	1
177	6B	492165.51	12030273.3	14.60021	14.65020	19.47	19.53	1
178	6B	487723.34	11942771.3	16.00780	16.15610	21.34	21.54	2
179	6B	483224.08	11859310.7	11.14656	11.09160	14.86	14.79	1
181	6B	469612.58	11827080.1	0.19222	0.19140	0.26	0.26	3
182	6B	449011.77	11704569.9	13.27437	13.29930	17.70	17.73	1
183	6B	421474.25	11783802.2	10.93965	11.01570	14.59	14.69	1
184	6B	418645.62	11554523.9	8.82356	8.83100	11.76	11.77	1
185	6B	463750.70	11166928.8	10.38200	10.39870	13.84	13.86	1
186	6B	472185.88	11120423.0	6.83673	6.85280	9.12	9.14	1
187	6B	495681.84	11320799.0	14.03420	13.99820	18.71	18.66	1
188	6B	516031.76	11667867.2	9.80714	9.77200	13.08	13.03	1
189	6B	513218.81	11794358.7	11.50072	11.49160	15.33	15.32	1
190	6B	517597.21	11878221.9	12.37787	12.38550	16.50	16.51	1
191	6B	526154.72	11825361.7	10.58192	10.57820	14.11	14.10	1
192	6B	535083.05	11772069.5	14.50646	14.50970	19.34	19.35	1
193	6B	544069.68	11725770.0	14.92652	14.95270	19.90	19.94	1
194	6B	552336.85	11679910.4	13.35410	13.27920	17.81	17.71	1
195	6B	560928.71	11623759.8	11.43600	11.45130	15.25	15.27	1
196	6B	573820.21	11654541.3	11.99416	12.00280	15.99	16.00	1
197	6B	565398.99	11705343.6	11.69162	11.69590	15.59	15.59	1
198	6B	556962.56	11756225.9	9.29602	9.31230	12.39	12.42	1
199	6B	547798.50	11802167.2	8.82048	8.74950	11.76	11.67	1
200	6B	540137.69	11857716.6	9.65192	9.66100	12.87	12.88	1
201	6B	531718.84	11908797.1	15.60665	15.62500	20.81	20.83	1
202	6B	528382.18	12043799.3	17.56128	17.59670	23.42	23.46	1
203	6B	536982.07	12002210.5	12.10241	12.08520	16.14	16.11	1
204	6B	545479.10	11945208.7	14.06640	14.09410	18.76	18.79	1
205	6B	553642.77	11891253.3	14.47215	14.48590	19.30	19.31	1
206	6B	560423.45	11836206.9	15.88279	15.89460	21.18	21.19	1
207	6B	570491.07	11789576.9	20.45660	20.46870	27.28	27.29	1

Box Core Number	Campaign	Actual Location		Weight (kg)		Abundance (kg/m2)		Nodule Facies
		Easting (E)	Northing (N)	Offshore (kg)	Onshore (kg)	Offshore	Onshore	
208	6B	580315.46	1174714.26	15.68094	15.70670	20.91	20.94	1
209	6B	587324.63	1168794.39	13.52294	13.55710	18.03	18.08	1
210	6B	595751.30	1163719.65	11.41743	11.43540	15.22	15.25	1
211	6B	600796.45	1171870.83	2.10299	2.10700	2.80	2.81	3
212	6B	591732.46	1177389.59	12.94277	12.96020	17.26	17.28	1
213	6B	583989.66	1182277.47	18.71487	18.93940	24.95	25.25	1
214	6B	574436.49	1187355.09	12.59742	12.62280	16.80	16.83	1
215	6B	567154.67	1192456.64	12.88151	12.91070	17.18	17.21	1
216	6B	559694.23	1196570.59	10.16900	10.18430	13.56	13.58	1
217	6B	548810.93	1202550.23	13.27286	13.28510	17.70	17.71	1
218	6B	542208.73	1208372.45	10.80441	10.81310	14.41	14.42	1
219	6B	533463.71	1212793.71	19.10461	19.64000	25.47	26.19	1
220	6B	525043.93	1217890.82	12.55892	12.56290	16.75	16.75	1
221	6B	538555.15	1221240.58	13.65917	13.66380	18.21	18.22	1
222	6B	546971.72	1216147.52	9.86255	9.85740	13.15	13.14	1
223	6B	555398.86	1211052.66	20.69955	20.72350	27.60	27.63	2
224	6B	564054.77	1205256.71	22.38086	22.34700	29.84	29.80	2
225	6B	572221.70	1200875.38	17.19870	17.21670	22.93	22.96	1
226	6B	580647.66	1195781.78	11.72413	11.73510	15.63	15.65	1
227	6B	586058.88	1205747.69	2.33487	2.28760	3.11	3.05	3
228	6B	578405.69	1208794.06	11.56571	11.57990	15.42	15.44	1
229	6B	568914.77	1214387.60	0.06436	0.05870	0.09	0.08	3
230	6B	560490.86	1219464.34	22.76269	22.83590	30.35	30.45	2
231	6B	552569.22	1224867.76	15.83721	15.84900	21.12	21.13	1
232	6B	573974.86	1222797.89	18.21135	18.25390	24.28	24.34	2
233	6B	581162.85	1217819.97	15.54404	14.93740	20.73	19.92	1
234	6B	595905.10	1221029.60	10.22326	10.22780	13.63	13.64	3
235	6B	590812.89	1212611.81	0.07280	0.06800	0.10	0.09	3
236	6B	599245.09	1207536.70	15.76633	15.77690	21.02	21.04	2
237	6B	594141.85	1199119.57	15.14613	15.13090	20.19	20.17	1
238	6B	589718.56	1191576.21	12.87776	12.88160	17.17	17.18	1
239	6B	597473.20	1185632.05	16.33166	16.60740	21.78	22.14	1
240	6B	427521.58	1208175.68	24.68888	24.74570	32.92	32.99	2
241	6B	427181.38	1208336.73	23.96558	23.97810	31.95	31.97	2
242	6B	427026.80	1208053.74	21.66339	21.68060	28.88	28.91	2
243	6B	427372.60	1207869.27	19.79228	19.83340	26.39	26.44	2
244	6B	475892.75	1155507.57	15.43054	15.45830	20.57	20.61	1
245	6B	476075.26	1155822.88	14.91209	14.93730	19.88	19.92	1
246	6B	476383.82	1155639.43	16.44459	16.47350	21.93	21.96	1
247	6B	476221.61	1155336.85	20.57729	21.44420	27.44	28.59	1
248	6B	494570.63	1110107.21	10.87185	10.80680	14.50	14.41	1
249	6B	508506.11	1112715.00	10.74484	10.77530	14.33	14.37	1
250	6B	502703.96	1104576.73	11.25303	11.27970	15.00	15.04	1
251	6B	511267.52	1099766.40	12.49379	12.51860	16.66	16.69	1
253	6B	525492.22	1101354.00	10.66706	10.67910	14.22	14.24	1
254	6B	538281.77	1106479.92	9.11155	9.13100	12.15	12.17	1
255	6B	531570.91	1133475.91	9.22072	9.24050	12.29	12.32	1
256	6B	538131.10	1142242.69	9.58975	9.61210	12.79	12.82	1
257	6B	558767.44	1141508.87	10.28829	10.33230	13.72	13.78	1
259	6B	567441.46	1157040.38	9.30402	9.32910	12.41	12.44	1
260	6B	581121.73	1160276.52	11.07592	11.09250	14.77	14.79	1
261	6B	578322.44	1152403.20	10.80130	10.82450	14.40	14.43	1
262	6B	571914.91	1143656.28	11.13739	11.16800	14.85	14.89	1
263	6B	564367.04	1148482.10	14.13325	14.10520	18.84	18.81	1
264	6B	546195.42	1159070.82	11.85999	12.31040	15.81	16.41	1
265	6B	541265.30	1150568.10	14.68998	14.71810	19.59	19.62	1
266	6B	550937.75	1145366.82	14.23761	14.27500	18.98	19.03	1
267	6B	567009.16	1135090.99	10.33807	10.36310	13.78	13.82	1
268	6B	560576.99	1126326.33	12.70976	12.73120	16.95	16.97	1
269	6B	553508.53	1131754.58	9.75852	9.84910	13.01	13.13	1
271	6B	528228.26	1146990.38	10.17807	10.19650	13.57	13.60	1
272	6B	523132.39	1138565.91	9.51211	9.75400	12.68	13.01	1
273	6B	540012.64	1128404.50	9.36063	9.38670	12.48	12.52	1
274	6B	547906.56	1123487.95	11.03703	11.07510	14.72	14.77	1
275	6B	556862.35	1118254.55	9.40559	9.44960	12.54	12.60	1
276	6B	551793.40	1109834.92	10.00252	10.03040	13.34	13.37	1
277	6B	534693.27	1119985.85	10.01188	10.04040	13.35	13.39	1
278	6B	526496.86	1125044.81	9.88382	9.90200	13.18	13.20	1
279	6B	518071.02	1130133.75	12.37066	12.40100	16.49	16.53	1
280	6B	504544.16	1126772.68	9.89743	9.91170	13.20	13.22	1

Figure 7.32 Map of NORI Area D showing box core sample locations and bathymetry



Note: Circles – Campaign 6A; triangles, Campaign 6B

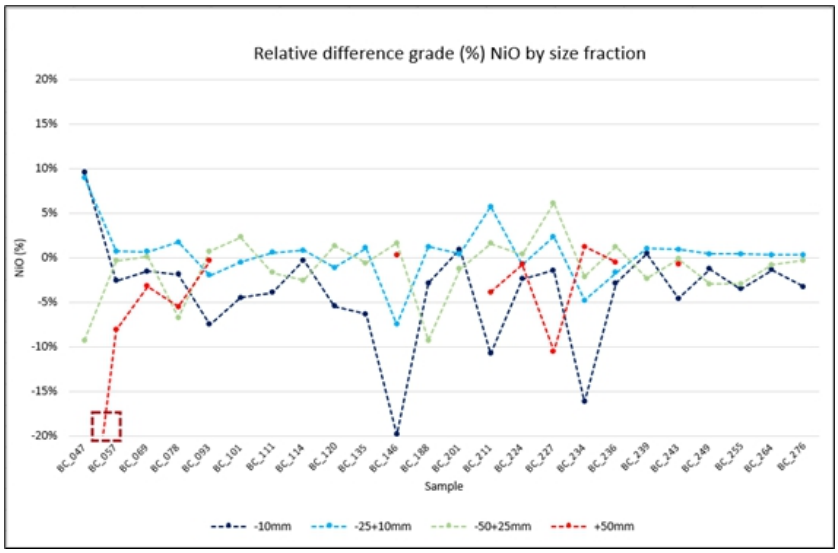
7.4.6 Analysis of grade distribution by size fraction

As part of the Campaign 6A and 6B box core sampling programme, a preliminary examination of the relationship between polymetallic nodule size and grade was carried out. Twenty-four (24) nodule box core samples were separated into four size fractions (+50 mm, –50 mm + 25 mm, –25 mm +10 mm, and –10 mm) using sieves.

Plots of the relative difference in grade between the assays for individual size fractions and the weight-averaged grade of the whole sample are shown in Figure 7.33 to Figure 7.36. The masses of the size fractions, in relative percentage, are shown in Figure 7.37. In general the proportion of material less than 10 mm (the -10 mm fraction) is very small.

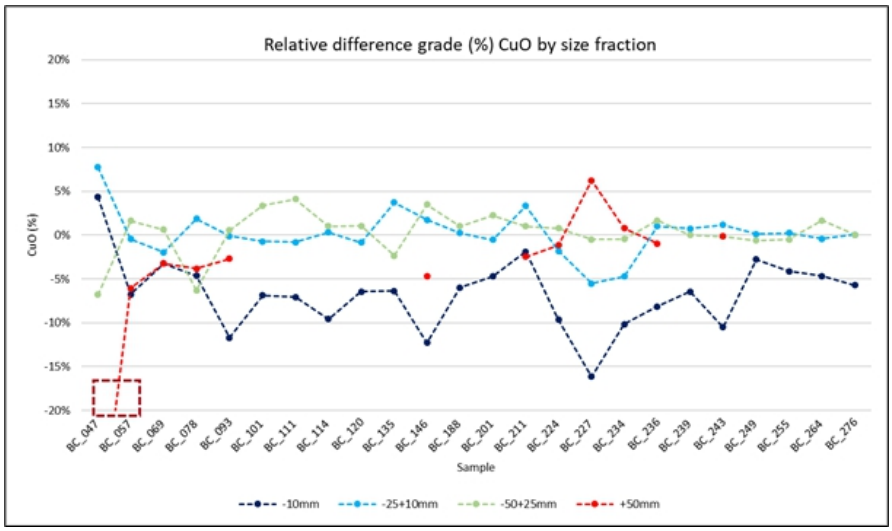
Twenty-four samples are too few to make firm statistical conclusions, but the data is sufficient to show that distribution of nickel, cobalt, copper and manganese is not uniform across particles of different sizes. The particles may be whole nodules or abraded pieces of larger nodules. The samples show that selection of the particle size range that will be recovered by the seafloor collection system, and loss of fines by abrasion in the ore handling systems, may have small impacts on the grade of the ore recovered to the production support vessel.

Figure 7.33 Relative difference of grade by size fraction – NiO (%)



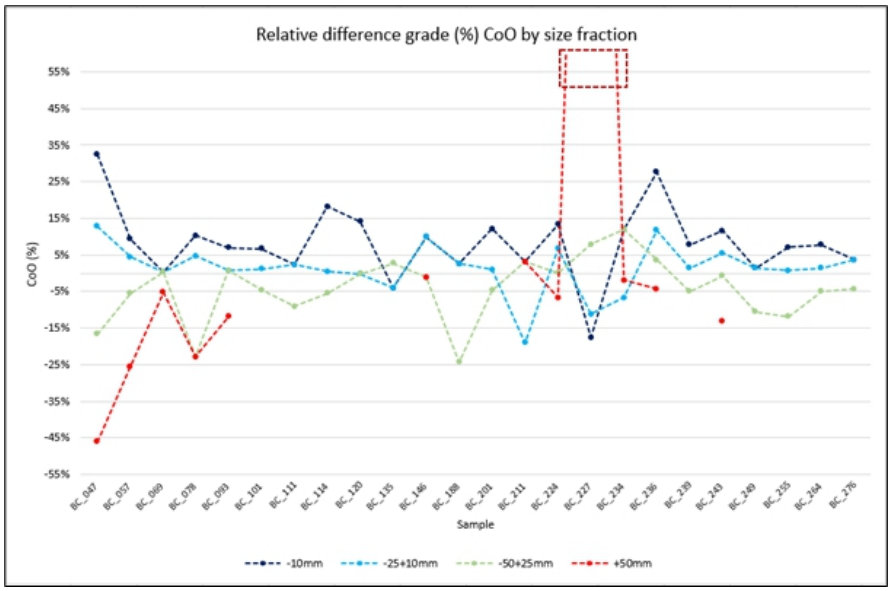
Note: Brown rectangle highlights anomalous grades in BC047

Figure 7.34 Relative difference of grade by size fraction – CuO (%)



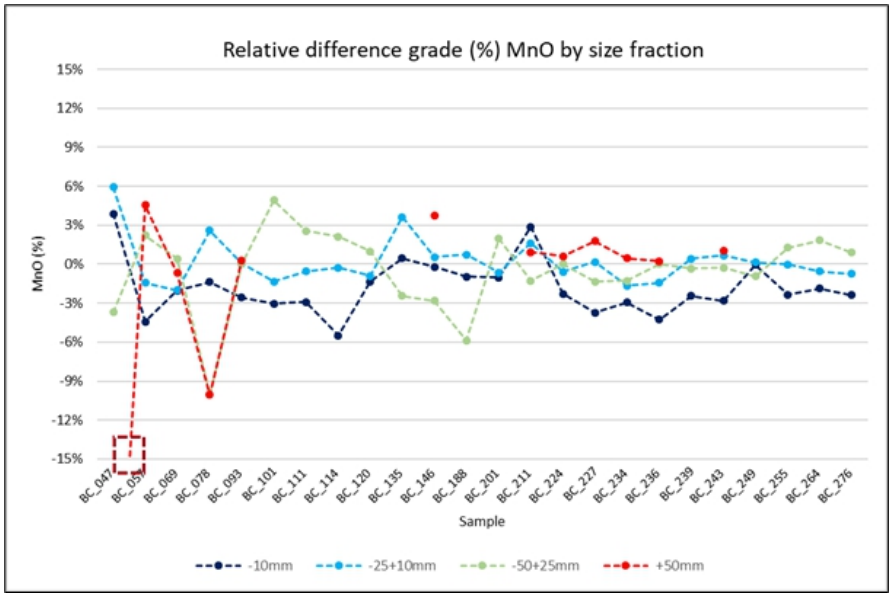
Note: Brown rectangle highlights anomalous grades in BC047

Figure 7.35 Relative difference of grade by size fraction – CoO (%)



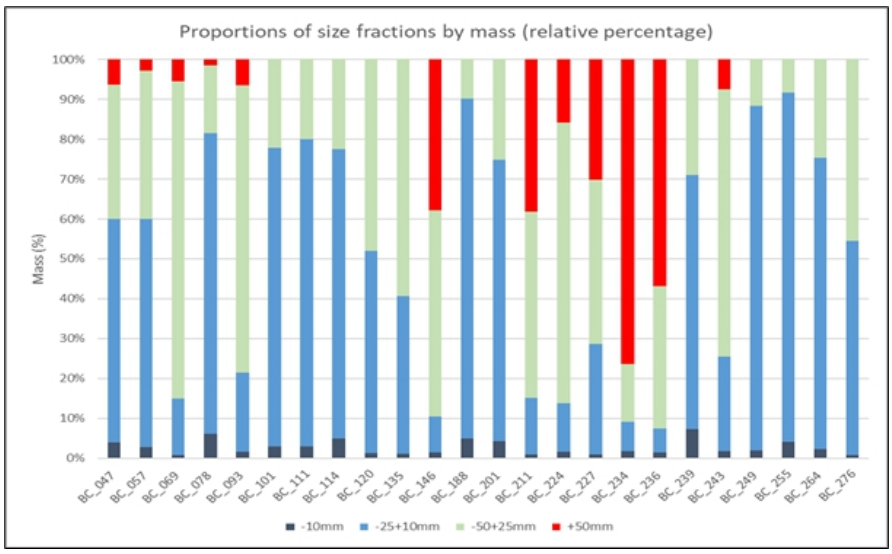
Note: Brown rectangle highlights anomalous value in BC227

Figure 7.36 Relative difference of grade by size fraction – MnO (%)



Note: Brown rectangle highlights anomalous grades in BC047

Figure 7.37 Proportions of size fractions by mass (relative percentage)



8 Sample preparation, analysis, and security

This Section describes the methods used for preparing and assaying the box core samples from the 2018 and 2019 exploration campaigns. The methods used in 2019 were not materially different from those used by NORI in 2018. In the opinion of the Qualified Person the sample preparation, security, and analytical procedures were adequate for estimation of Mineral Resources. The assays produced from this programme, supplemented by Pioneer Investor data, were used for estimation of Mineral Resources in NORI Area D.

8.1 Security

8.1.1 Box core samples

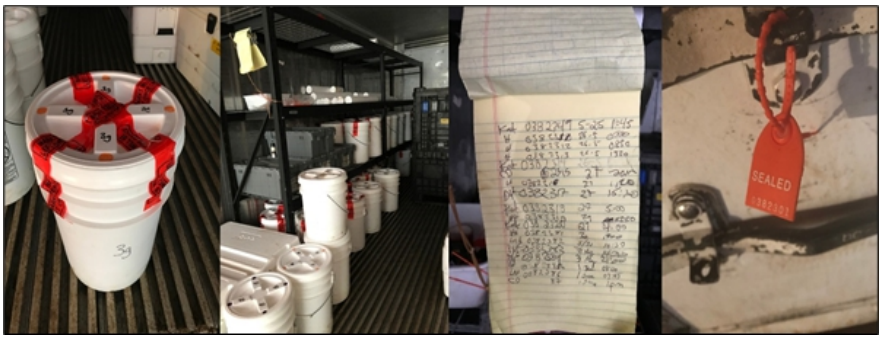
The geoscience laboratory on board the Maersk Launcher was manned by a team of qualified geoscience staff rotating on 12-hour shifts during box coring operations. All samples were weighed at the weighing stations. Reference weights were used to periodically check the accuracy of the electronic scales. All weights and associated nodule descriptions were recorded in logbooks (also digitally scanned) and captured in a digital (Excel) database. A digital photographic archive of all samples was also compiled. Data was stored on a computer and backups to external disks were regularly made.

On completion of processing, samples were stored in polythene bags placed in gasket-sealed plastic pails. All nodule pails were assembled in the geoscience laboratory and temporarily stored there until they were transported to a refrigerated container (reefer). The reefer was secured with a tag-in, tag-out system.

Sample bags were prepared with triple redundancy- numbered zip tie, printed bar code, and hand-written in permanent ink. Tracking of samples was maintained with a bar-code scanner and digital database.

Following checking of the nodule count in each box core against the photographic record and reweighing of the nodules, the samples from the depth layers were recombined. These samples were assembled into respective storage pails depending on sample type and destination. Each sample was scanned and recorded on the sample master spreadsheet, and sample pails sealed with tamper-proof tape, and carried to the secured storage reefer Figure 8.1.

Figure 8.1 Sample storage



Source: NORI. Note: (Left to right) sealed pail containing samples, secured refrigerated container, tag-in tag-out logbook, and seal.

All samples were taken out of the reefer and reweighed on land upon arrival in San Diego. The sealed pails were reopened by geoscientists, weighed, scanned, replaced in pails, sealed with tamper-proof tape and returned to the secured storage reefer. Regular email communications were conducted with the Qualified Person for the Mineral Resource estimate during the sample acquisition operations.

8.1.2 Camera imagery

Camera imagery and data acquired by the Fugro ESVII AUV in 2018 was logged to the AUV's internal payload processing data storage disk. This data is co-registered, and time-date stamped with the vehicle's other geophysical sensors (e.g., SSS) and navigation systems and resultant navigation data. The vehicle was positioned with a combination of INS and USBL navigation.

Once each dive was completed and the AUV returned to deck, the data was transferred across from the payload data disk bottle to the Fugro data processing server and backed-up.

Preliminary processing of the data was undertaken on board to aid follow-up survey site selection and optimisation. Review of the data was undertaken by the Fugro Geoscience team and NORI Client Representative on the vessel. The data was fully processed post campaign completion at Fugro's Layfette offices in Louisiana.

Additional image classification and nodule long-axes automated extraction was undertaken by the same Fugro 2018 NORI campaign Geoscience members at Fugro's offices in Houston, Texas.

8.2 Sample preparation and assaying

All samples were freighted to ALS Laboratory Group (ALS) in Brisbane, Australia. ALS has a biosecurity quarantine facility approved by the Australian Quarantine and Inspection Service (AQIS). All samples were irradiated before clearing quarantine. The samples were not heat-treated as this would have resulted in breakdown of some of the hydroxide minerals.

The samples were inspected by AMC staff to confirm that there had been no tampering since despatch from San Diego.

Each box core sample was divided into four: a primary sample, a duplicate
(primary laboratory), a duplicate (secondary laboratory) and a reference sample. For the 2018 campaign this was carried out onboard the vessel, as described in Section 9.3.8. For the 2019 campaigns, the division was carried out by cone and quartering at the on-shore laboratory.

The primary samples were submitted to ALS. For the 2018 sampling campaign, the duplicates (secondary laboratory) were submitted to Bureau Veritas laboratory in Perth, Australia. For the 2019 sampling campaigns, the duplicates were assayed at ALS and a separate set of pulps was later sent to BV for independent analysis. Reference samples were retained by NORI and stored in Brisbane.

ALS in Brisbane was selected as the primary laboratory as it has extensive experience in the analysis of high manganese samples and polymetallic nodules. ALS operates quality systems based on international standards ISO/IEC17025:1999 "General requirements for competence of calibration and testing laboratories" and ISO9001:2000 "Quality Management Systems Requirements".

The sample preparation and assaying procedure at ALS was as follows:

- Samples were transferred to barcode-labelled aluminium trays and dried in an oven at 105 °C for three (3) days. This was a higher temperature than use in the 2018 programme but there appear to be no significant differences between the assays as a consequence. Moisture loss was measured.
- After drying, samples were jaw crushed in a Jacques jaw crusher to reduce particle size to less than 10 mm.
- The crushed samples were then pulverised in an LM5 mill to a powder with typical particle size >85% passing 75 µm. Very small samples were pulverised in a smaller bowl using an LM2 mill. A sieve test was conducted for every 20^{th} sample to check the particle sizes.
- Pulps were analysed by a fusion/XRF method (ME-XRF26s) using a small aliquot (0.33 g) to avoid fusion problems. The following oxides were reported:
  - LOI, Al_2O_3, BaO, CaO, Cr_2O_3, CoO, Fe_2O_3, K_2O, CuO, MgO, MnO, Na_2O, P_2O_5, SO_3, SiO_2, NiO, TiO_2, PbO, ZnO.
- Pulps were fused with lithium borate to create a bead that was dissolved with acid and analysed by inductively-coupled plasma emission mass spectroscopy (ICP-MS) (method ME-MS81) for:
  - Ba, Ce, Cr, Cs, Dy, Er, Eu, Ga, Gd, Hf, Ho, La, Lu, Nb, Nd, Pr, Rb, Sm, Sn, Sr, Ta, Tb, Th, Tm, U, V, W, Y, Yb, Zr.
- Pulps were analysed for:
  - As, Cd, Li, Mo, Sb by four acid ICP-AES method (ME-ICP61).
  - Bi, Ge, Se, Te, Tl by four acid digest ICP-MS (method ME-MS62s).
  - Hg by low temperature digestion in aqua regia and ICP-MS (method Hg-MS42).
  - B by ICP-MS (method B-ICP69.
  - F by KOH fusion and ion selective electrode (method F-ELE81a).
  - Loss on ignition (LOI) at 1000 °C.

Manganese can exist in different oxidation states. AMC checked the totals of all the oxides plus LOI for each sample. The totals were generally about 96%. The shortfall of about 4% appears to arise because some of the manganese occurs in higher-valence states. A more realistic conversion of elemental manganese to manganese oxide would be approximately $MnO_{1.85}$.

ALS also reported a calculated total, being the sum of the reportable analytes plus LOI. Manganese was included in this calculation as Mn_3O_4 but was reported on the certificate of analysis as MnO. This leads to the sum of analytes reported plus LOI, calculated by AMC, adding up to a lower value than the total calculated by ALS. The ALS calculation using Mn_3O_4 is aimed at covering the middle ground of MnO and MnO_2.

BV was used as the secondary laboratory, to provide an independent check on the accuracy of the sample preparation and assaying by ALS. BV operates quality systems based on international standards ISO/IEC17025:1999 and ISO9001:2000. Each sample batch included internal quality control samples (certified reference materials).

The sample preparation and assaying procedure at BV was as follows:

- Samples were dried in an oven at 105 °C. Moisture loss was measured.
- Samples crushed and split, if required, then pulverised in a vibrating pulveriser

- Pulps were cast using a 12:22 flux with added sodium nitrate to form a glass bead. The beads were analysed by XRF for: TiO2, Fe, Al2O3, SiO2, Mn, CaO, MgO, S XRF, P XRF, BaO, K2O.
- Pulps were analysed by Laser Ablation Inductively Coupled Plasma Mass Spectrometry for:
  - Ag, As, Ba, Be, Bi, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, In, La, Lu, Mn, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Re, Sb, Sc, Se, Sm, Sn, Sr, Ta, Tb, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr.
- Pulps were analysed for LOI at 1000 °C.

8.3 Quality assurance and quality control procedures 2018

Certified reference materials (CRMs), blank samples (crushed rock samples with very low Mn, Ni, Co and Cu) and duplicate samples were used for quality control and quality assurance during the NORI 2020 campaign.

8.3.1 Certified reference materials

The CRM called NOD-P-1, manufactured by the U.S. Geological Survey (USGS), was used for the NORI 2020 campaign. Material used in the preparation of the CRM was collected from the Pacific Ocean (14°50’ N, 124°28’ W) at a depth of 4,300 m.

Six CRMs were inserted into the NORI 2018 campaign sample submissions at a rate of 1 in 14. Table 8.1 shows the assayed oxide values for manganese, cobalt, nickel and copper for the CRMs and the certified values for NOD-1-P.

There was a slight positive bias in the manganese oxide assays and the BV (Bureau Veritas Minerals Pty Ltd) assays for nickel, manganese and cobalt were slightly elevated relative to those from ALS but these differences are not significant. The CRM results indicate that the NORI 2018 assay results are satisfactory.

Table 8.1 CRM assays from NORI 2018 campaign

Sample	NiO (%)	CuO (%)	MnO (%)	CoO (%)	Laboratory
Certified value	**1.71**	**1.44**	**37.6**	**0.28**	**-**
0367075A	1.720	1.430	38.040	0.280	ALS
0367108A	1.730	1.450	38.240	0.280	ALS
0367175A	1.720	1.420	38.000	0.280	ALS
0367177A	1.720	1.410	37.920	0.280	ALS
0367109A	1.781	1.440	38.865	0.294	BV
0367183A	1.794	1.452	38.865	0.296	BV

8.3.2 Blanks

The blank samples were composed of dolomite gravel or granite, which were expected to have very low content of manganese, cobalt, nickel and copper. The blank material was not assayed prior to insertion in the NORI sample batches. A total of 11 blank samples were inserted into the NORI 2018 sample assay batches at a rate of 1 in 8. Table 8.2 shows the assayed oxide values for the blanks. The assays for the blank samples indicate slightly elevated manganese (deliberate as some of the blanks had manganese mixed in with the blank) and negligible nickel, copper and cobalt.

Table 8.2 Blank sample assays from NORI 2018 campaign

Sample	NiO (%)	CuO (%)	MnO (%)	CoO (%)	Laboratory
0367116A	0.010	0.010	0.380	0.010	ALS
0367089A	0.030	0.030	0.630	0.010	ALS
0367091A	0.010	0.010	0.230	0.010	ALS
0367118A	0.010	0.010	0.380	0.010	ALS
0367200A	0.010	0.010	0.060	0.010	ALS
0367202A	0.020	0.010	0.420	0.010	ALS
0367241A	0.010	0.010	0.460	0.010	ALS
0367052A	0.006	0.004	0.181	0.001	BV
0367088A	0.010	0.007	0.232	0.001	BV
0367149A	0.009	0.009	0.284	0.001	BV
0367239A	0.003	0.002	0.142	0.002	BV

8.3.3 Duplicates

Duplicate samples were prepared by cone and quartering the box core samples, as described in Section 9.3.8.

A total of 44 samples were assayed at ALS paired with duplicate samples also assayed at ALS. Figure 8.2 presents the results. The precision of the results is very good and there is no evidence of significant biases or errors.

A total of 43 samples were assayed at ALS paired with duplicate samples assayed at BV. Figure 8.3 presents the results. The precision of the results is good. There are very small high bias for nickel and manganese compared with the ALS assays Table 8.3 but this is not significant.

These results are consistent with the observation for the assays of the NOD-P-1 standard.

The maximum half absolute relative difference for the ALS paired data is NiO = 1.95%, CuO = 4.76%, MnO = 1.99%, CoO = 4.35% and for the BV assays paired with the ALS primary samples is NiO = 3.22%, CuO = 2.49%, MnO = 2.31%, CoO = 6.35%. The precision in the nodule sample assays is acceptable.

Figure 8.2 Comparison of primary samples assayed at ALS and duplicate samples assayed at ALS

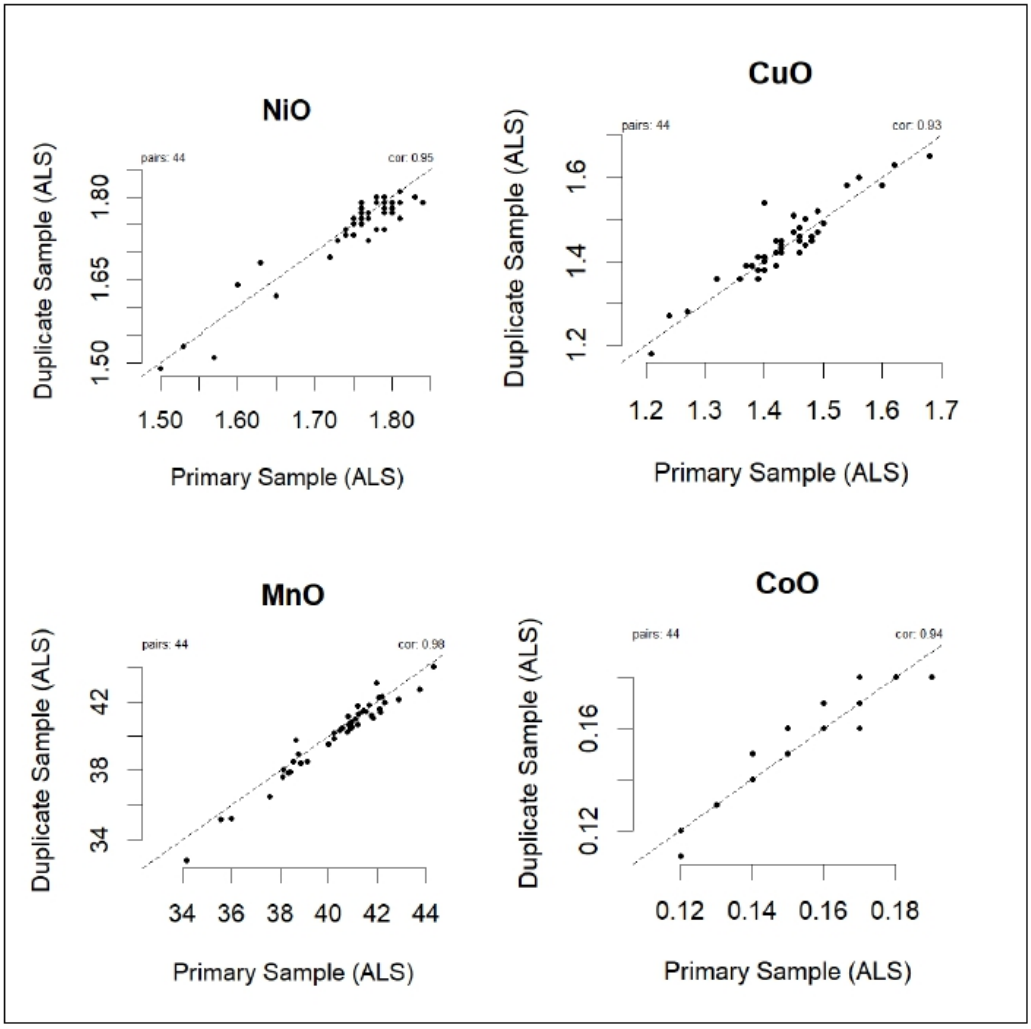


Figure 8.3 Comparison of primary samples assayed at ALS and duplicate samples assayed at BV

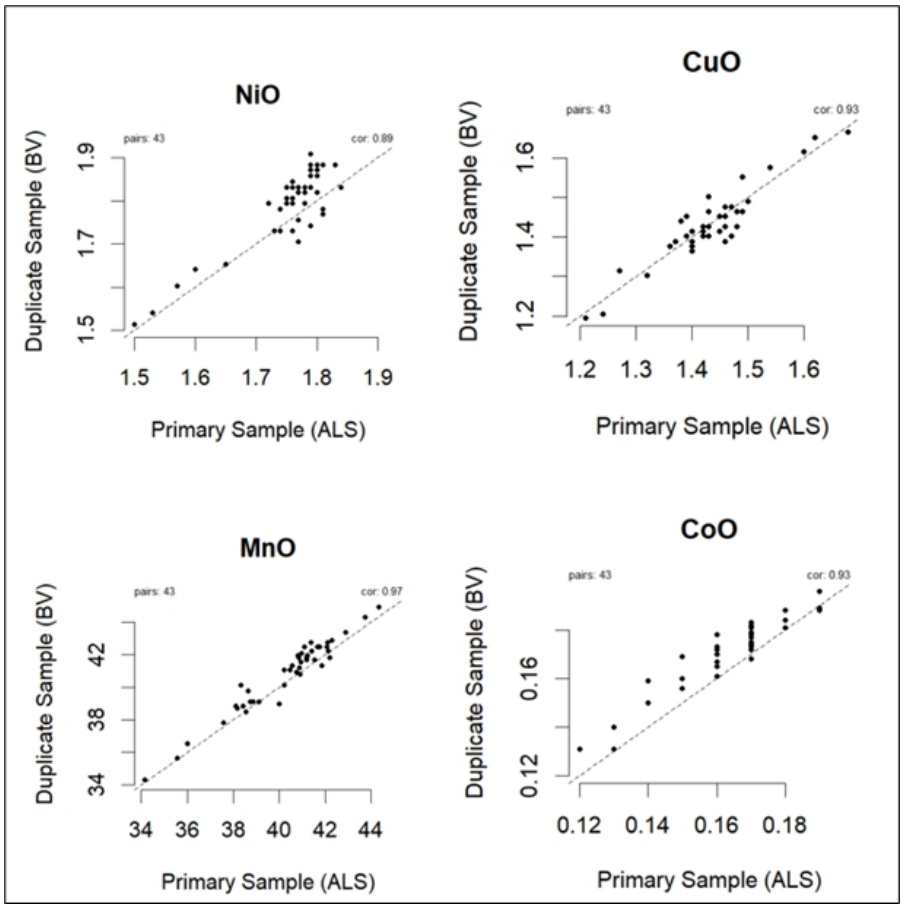


Table 8.3 Duplicate average sample grades by laboratory

Variable	ALS Primary	ALS Duplicate	BV Duplicate
NiO (%)	1.75	1.74	1.79
CuO (%)	1.44	1.44	1.43
MnO (%)	40.39	40.11	40.82
CoO (%)	0.16	0.16	0.17

8.4 Quality assurance and quality control procedures 2019

Certified reference materials (CRMs), blank samples, and duplicate samples were used for quality control and quality assurance during assaying of the samples collected in the 2019 campaigns.

8.4.1 Certified reference materials

The CRM called NOD-P-1 was used. A total of 22 CRMs were inserted into sample submissions at a rate of 1 in 10. Table 8.4 shows the assays for the CRMs and the certified values for NOD-1-P.

There was a slight positive bias in the manganese oxide assays and the BV (Bureau Veritas Minerals Pty Ltd) assays for nickel, manganese and cobalt were slightly elevated relative to those from ALS but these differences are not significant. The CRM results indicate that the NORI 2019 assay results are satisfactory.

All the assays for Nod-1-P from ALS were within two standard deviations of the certified values and were satisfactory. The single Nod-1-P sample assayed at BV returned assays for nickel, copper, manganese and cobalt that were all biased slightly high.

Table 8.4 CRM assays from NORI 2019 campaigns

Sample	NiO (%)	CuO (%)	MnO (%)	CoO (%)	Laboratory
Certified value	**1.71**	**1.44**	**37.6**	**0.28**	**-**
STD11	1.73	1.43	37.86	0.28	ALS
STD12	1.72	1.43	37.79	0.28	ALS
STD1	1.73	1.45	37.3	0.29	ALS
STD2	1.72	1.42	37.29	0.28	ALS
STD3	1.71	1.42	37.14	0.28	ALS
STD4	1.71	1.41	37.13	0.28	ALS
STD5	1.72	1.44	37.43	0.28	ALS
STD6	1.73	1.44	37.54	0.28	ALS
STD7	1.73	1.47	37.73	0.29	ALS
STD8	1.71	1.44	37.39	0.28	ALS
STD9	1.72	1.45	37.59	0.28	ALS
STD10	1.71	1.42	37.7	0.28	ALS
STD13	1.73	1.43	38.07	0.29	ALS
STD14	1.73	1.43	37.94	0.29	ALS
STD15	1.73	1.44	37.93	0.29	ALS
STD16	1.71	1.42	37.49	0.28	ALS
STD17	1.72	1.43	37.74	0.28	ALS
STD18	1.72	1.42	37.67	0.28	ALS
STD19	1.72	1.43	37.85	0.28	ALS
STD20	1.72	1.43	37.82	0.29	ALS
STD21	1.71	1.43	37.72	0.28	ALS
STD4	1.82	1.54	38.87	0.30	BV

8.4.2 Blanks

The blank samples were composed of recycled glass, which were expected to have very low content of manganese, cobalt, nickel and copper. The blank material was not assayed prior to insertion in the NORI sample batches. A total of 11 blank samples were inserted into the NORI 2019 sample assay batches at a rate of 1 in 19. Table 8.5 shows the assays for the blanks. The assays for the blank samples indicate negligible contamination in the sample preparation.

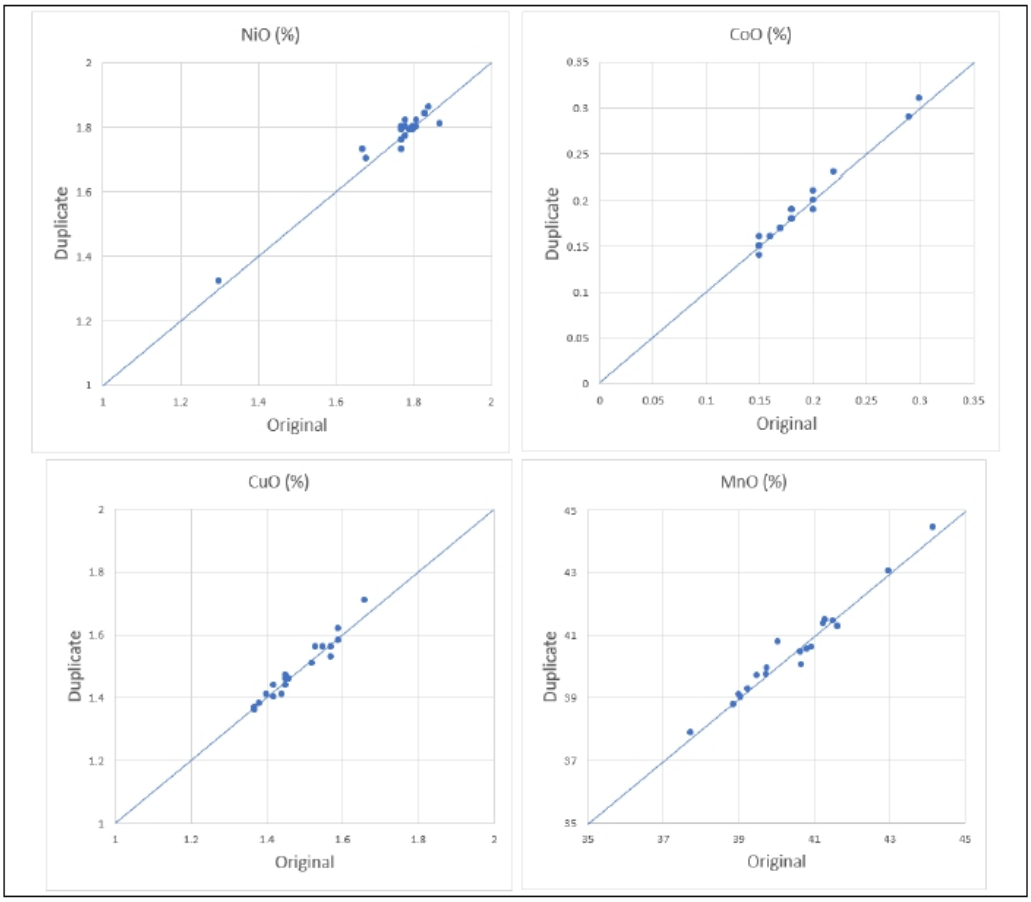
Table 8.5 Blank sample assays from NORI 2019 campaign

Blank name	Sample	NiO (%)	CuO (%)	MnO (%)	CoO (%)
UUM_3	Blank1	<0.01	<0.01	<0.01	<0.01
UUM_3	Blank2	0.01	<0.01	0.13	<0.01
UUM_3	Blank3	0.01	0.01	0.13	<0.01
UUM_3	Blank4	0.01	0.01	0.12	<0.01
UUM_3	Blank5	0.02	0.01	0.57	<0.01
UUM_4	Blank6	<0.01	0.02	<0.01	<0.01
UUM_4	Blank7	<0.01	0.03	<0.01	<0.01
UUM_4	Blank8	0.02	0.02	0.2	<0.01
UUM_4	Blank9	0.01	0.03	0.22	<0.01
UUM_4	Blank10	0.01	0.02	0.16	<0.01
UUM_4	Blank11	0.02	0.04	0.42	<0.01

8.4.3 Duplicates

Duplicate samples were prepared by cone and quartering the box core samples, as described in Section 9.3.8. A total of 19 samples were assayed at ALS paired with duplicate samples also assayed at ALS. Figure 8.4 and Table 8.6 presents the results. The precision of the results is very good and there is no evidence of significant biases or errors.

Figure 8.4 Comparison of primary samples assayed at ALS and duplicate samples assayed at ALS



Note: Diagonal blue line at 1:1 ratio

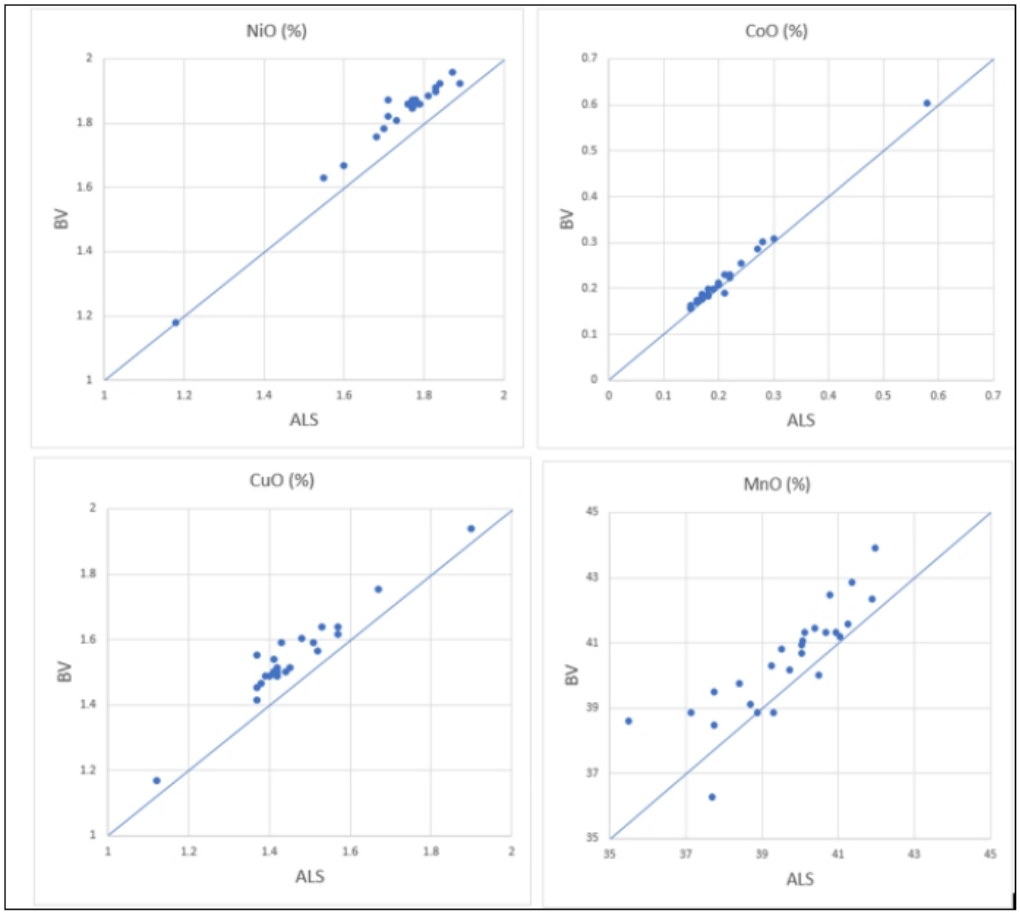
Table 8.6 Duplicate average sample grades from ALS

Variable	Number	ALS Primary	ALS Duplicate
NiO (%)	19	1.76	1.77
CuO (%)	19	1.48	1.49
MnO (%)	19	40.47	40.47
CoO (%)	19	0.19	0.19

The pulps of 27 pulp samples assayed at ALS were resubmitted for assay at BV. Figure 8.5 presents the results. The results for nickel, copper, cobalt and manganese are all biased high by approximately3% to 5%, compared with the ALS assays Table 8.7.

These results are consistent with the observation for the assays of the NOD-P-1 standard which indicated that the BV results were biased slightly high.

Figure 8.5 Comparison of primary samples assayed at ALS and duplicate samples assayed at BV



Note: Diagonal blue line at 1:1 ratio

Table 8.7 Duplicate average sample grades from ALS and BV

Variable	Number	ALS Primary	BV Pulp Duplicate
NiO (%)	27	1.74	1.82
CuO (%)	27	1.47	1.56
MnO (%)	27	39.4	40.5
CoO (%)	27	0.21	0.22
SiO2 (%)	27	12.6	12.9

8.5 Moisture content

The moisture content of polymetallic nodules consists of two main types of water: free water occurring with pore spaces and water of crystallisation which forms part of the mineral structure of many of the iron and manganese minerals in the nodules. There may also be moisture held in meta-stable mineral phases.

Manganese minerals with various types of crystalline lattice have different levels of thermal stability. Layered manganese minerals (buserite I, asbolane-buserite, and birnessite) are stable up to 120 °C–150 °C; asbolane up to 180 °C, vernadite, up to ∼500 °C; todorokite and pyrolusite, up to 600° and 670 °C, respectively (Novikov and Bogdanova, 2007). Measures of the moisture content of polymetallic nodules are therefore highly dependent on the temperature and the length of time to which the nodules are heated.

Published data on the moisture content of polymetallic nodules is commonly inconsistent. The following moisture content information was obtained from samples collected in the NORI Areas:

- A drying test undertaken on a nodule sample collected during the NORI 2012 campaign indicated moisture loss of 24% at 120°C (Golder, 2015).
- Average moisture content of four Campaign 2 samples dried for 12 hours at 120 °C was 28.7% (Golder, 2015).
- Average moisture content of the Campaign 3 (2018) box core samples dried for three days at 60 °C (at ALS) was 19.3% and LOI at 1,000 °C was 16.8%.
- Average moisture content of the Campaign 3 (2018) box core samples dried for at 105 °C (at Bureau Veritas) was 17.0% and LOI at 1,000 °C was 16.6%.
- Average moisture content of the Campaign 6A and 6B (2019) box core samples dried for at 105 °C (at ALS) was 28.1% and LOI at 1,000 °C was 15.6%.

Ambient conditions, such as air temperature, humidity, evaporation rate and exposure time, during the handling of the nodules prior to sealing in sample bags were not recorded in these programmes. Also, the impact of drying time and oven temperature on the removal of pore water from the nodule samples has not been quantified. Consequently, the average moisture contents measured in different campaigns may not be directly comparable.

The loss on ignition data, which are measures of water of crystallization, are better controlled and show a reasonable degree of consistency.

9 Data verification

The original assay sheets for the individual samples collected by the Pioneer Investors from within the NORI Area are not available for auditing against the values in the database. Neither AMC nor DeepGreen nor NORI have had access to the original assay sheets for the individual samples that are within the Area, nor the quality control procedures used by the laboratories and the ISA. However, the consistency between the abundance and grade data collected by the Pioneer Investors, as presented in Section 9.1, supports the contention that the quality of the Pioneer Investor data is satisfactory.

It is also reasonable to infer that the Pioneer Investor data are of sufficient quality for resource estimation because the ISA is an independent agency with significant accountability under the Law of the Sea. Part of its mandate is the receipt and storage of seafloor sampling data suitable for the estimation of nodule resources and the legally binding award of licenses. It is reasonable to assume that a reasonable level of care was applied by the ISA.

Data collected by NORI is well-documented and was subject to satisfactory QA/QC processes. Documentation verified by the Qualified Person includes photographs, daily exploration reports, digital logging sheets and original assay reports. In the opinion of the Qualified Person the NORI data is of high quality and suitable for estimation of Measured Mineral Resources.

Assaying of nodules collected by NORI in 2012, 2013, 2018, and 2019 confirm the mean grades of the historical grab samples and support the contention that the quality of the Pioneer Investor data is satisfactory for inclusion in resource estimation. The main limitation with the Pioneer Investor data is the likelihood that some of the abundance values were too low, due to loss of nodules from the FFG. Estimates of abundance that include Pioneer Investor data are therefore likely to be conservative.

In the opinion of the Qualified Person the sample preparation, security, and analytical procedures were adequate for estimation of Mineral Resources.

10 Mineral processing and metallurgical testing

10.1 Introduction

A combined pyro- and hydro-metallurgical flowsheet was evaluated for these IA. Similar flowsheets were investigated at various times over the last several decades. NORI initially relied on the significant body of information in the literature for process development. Subsequently, they have embarked on an extensive program of small and pilot-scale pyrometallurgical test work that has further informed definition of that part of the flowsheet. The work to date is discussed in Section 10.3.

The literature on test work for this process was reviewed and interpreted by Kingston Process Metallurgy in their report to NORI in October 2017. In turn, that report was reviewed as part of the current study, with important aspects from it being adopted for the purposes of process modelling and definition. Relevant extracts from the report are reproduced below in Section 10.2 shown in *italic* font. Comments from the Initial Assessment Section 13 author are shown as footnotes where applicable.

10.2 Literature review (from KPM concept study, 12 October 2017)

10.2.1 Studies on the pyrometallurgical processing of polymetallic nodules

Pyrometallurgical processing of nodules has been extensively studied from the early 1970s until the present day and appears to be the preferred process for most of the other currently active nodule processing research groups. Many groups including: Kennecott; Inco; Cuban / Bulgarian; German; Indian; Japanese; and Korean have studied pyrometallurgical processing of nodules at a laboratory scale. The nodule samples for these tests were collected from their respective license areas in the Clarion Clapperton [sic] Zone (CCZ). The composition of the nodules used in each of the studies is compared in
Table 10.1 with that of the NORI Area D resource nodules. [Note: the NORI assays are from samples collected prior to 2017, not the current resource estimate].

Table 10.1 Comparison of sea nodule composition

Element	NORI	Inco	German	Japan	Indian	USBM
Ni	1.36%	1.14%	1.36%	1.36%	1.15%	1.33%
Cu	1.14%	0.80%	1.17%	1.04%	1.10%	1.20%
Co	0.13%	0.22%	0.16%	0.18%	0.08%	0.23%
Mn	28.40%	23.20%	31.23%	28.40%	24.30%	29.70%
Fe	6.68%	6.90%	6.20%	5.07%	5.36%	5.50%
Mo	-	0.06%	0.06%	0.06%	-	-
Zn	0.15%	0.11%	0.15%	0.14%	-	0.15%
SiO_2	18.40%	18.43%	12.64%	12.20%	13.14%	13.40%
Al_2O_3	3.89%	5.80%	4.29%	4.35%	4.5%	4.76%
MgO	2.92%	2.90%	3.20%	-	2.70%	3.12%
CaO	2.16%	1.81%	2.27%	2.19%	0.76%	1.79%
Na_2O	2.40%	5.12%	2.74%	-	1.02%	2.97%
K_2O		-	1.19%	-		1.13%
P		0.17%	0.21%		0.01%	0.10%
MnO / SiO_2	1.99	1.63	3.19	3.01	2.39	2.86

It should be noted that while in general the different nodule samples have similar compositions, there are subtle variations that can have significant implications for pyrometallurgical processing. Of particular importance is the ratio of MnO:SiO2 in the nodules as this impacts the choice of process operating parameters for the electric furnace smelting operation. This issue is discussed further in the Sections below.

Based on a review of the data found in the nodule smelting literature, it was concluded that the best data for designing a preliminary pyrometallurgical flowsheet for treating NORI nodules was provided by the Inco, Japanese and German references.

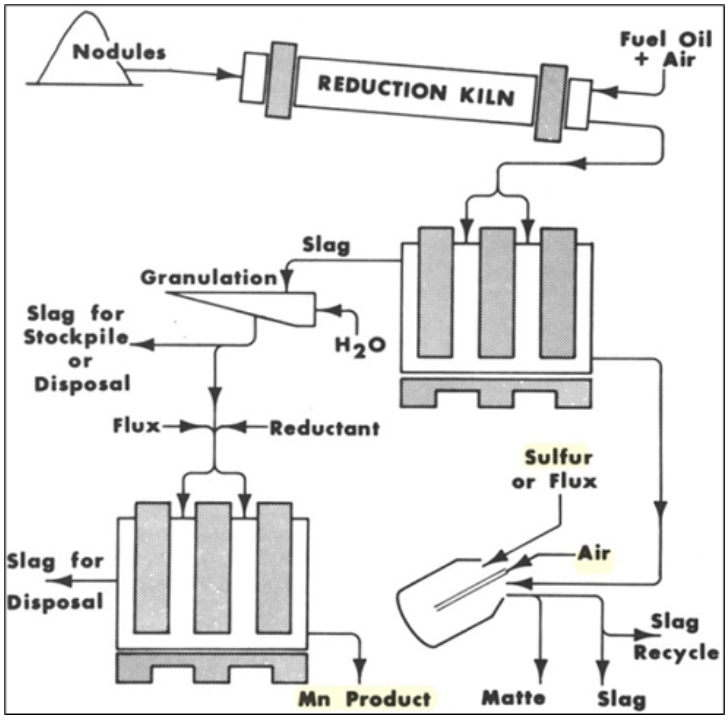
10.2.1.1 Inco

Inco[1] did extensive test work in the early 1970s on smelting nodules using a conventional Rotary Kiln Electric Furnace (RKEF) flowsheet for FeNi production from laterite, as shown in Figure 10.1.

Inco carried out laboratory tests using as received nodules (30% moisture) to simulate drying and reduction in a rotary kiln at 1,000 °C using a reducing gas containing: 14.7% CO, 8.2% H_2, 6.7% CO_2, 6.7% H_2O and 63.2% N_2 from combusting Bunker C oil with 60% stoichiometric air. Most of the Ni, Cu and Co oxides (70–90%) were reduced together with about 25% of the Fe oxides to a metal. With the addition of 4.5% anthracite coal, the extent of Fe oxide reduction to metal increased to about 45%. Inco also carried out tests to study the behaviour of the nodules in a 15 cm diameter pilot scale rotary kiln and reported that the amount of dust generated was similar to that observed in a commercial laterite rotary kiln and that the maximum temperature of operation for a kiln would be about 1,000 °C before the reduced nodules became sticky and caused plugging of the kiln. Unfortunately, no other data was reported from the pilot kiln tests.

[1] R. Sridhar, W. E. Jones, and J. S. Warner, “Extraction of copper, nickel and cobalt from polymetallic nodules”, JOM, April 1976, p 32.

Figure 10.1 Schematic flow diagram of the Inco process for treating polymetallic nodules



The Inco nodules had a low MnO:SiO_2 ratio of 1.6 with an estimated liquidus temperature of only about 1,300 °C. The Ni-Cu-Co-Fe alloy has a similar liquidus temperature so that no fluxes were needed to be able to smelt the nodules to produce a fluid slag and alloy at a reasonable temperature of about 1,400 °C. The pre-reduced nodules were blended with coal and smelted in crucibles at 1,380-1,420 °C for 1 hour to produce a metal phase, typically containing >90% of the Ni, Cu and Co, and a slag phase containing >97% of the Mn. No fluxes were added. Typical results are shown in Table 10.2 and Table 10.3.

Table 10.2 Results from Inco smelting tests

Element	Alloy[1] - Wt %	Slag[2] - Wt %	Recovery in Alloy Wt %
Nickel	12.5–21.0	0.05–0.15	93–98
Copper	8.5–11.5	0.04–0.12	85–95
Cobalt	2.0–3.0	0.006–0.015	90–98
Iron	60.0–70.0	0.7–1.7	80–90
Manganese	0.3–6.0	25–33	0.5–2.5

Pre reduced at 1000 °C for 1 hour and smelted at 1400 °C.
1 6–8.5% of dry nodule weight.
2 72–80% of dry nodule weight.

Table 10.3 Distribution of Elements During Reduction Smelting (Inco)

Element	Alloy[1] - Wt %	Slag[1] - Wt %	Recovery[2] in Alloy, Wt %
Nickel	13.7	0.05	98
Copper	8.7	0.02	95
Cobalt	2.3	0.006	98
Iron	70.7	1.26	87
Manganese	1.2	32.0	0.5
Molybdenum	0.56	< 0.01	>86
Vanadium	0.002	0.04	0.5
Titanium	0.02	0.45	0.5
Zinc	0.09	0.01	6
Lead	0.01	0.003	2
Phosphorus	0.99	0.13	36
Sodium	< 0.003	2.76	1
Arsenic	0.04		64
Antimony	0.03		~100

[1] Alloy was 8% of dry nodule weight and slag was 72% of dry nodule weight.
[2] Recovery from nodules.

The molten Ni-Cu-Co-Fe alloy from the smelting furnace was converted using air to oxidise the Mn and about 15% of the Fe to slag. The alloy was then sulphidised by injecting elemental sulfur to form Ni_3S_2, Cu_2S and Co_9S_8 and the resulting highly metallised (Fe) matte was converted using air to form a high-grade (HG) matte (about 5% Fe) and a low Ni-Cu-Co slag with minimal SO_2 generation.

The ground matte was oxygen pressure leached at 110-160 °C in sulfuric acid to extract 99% of the contained Ni, Cu and Co and precipitate most of the Fe. In the Inco flowsheet, it was proposed to recover the Cu by SX/EW and the Ni and Co as metals or salts by any of the many available conventional processes. A high Mn slag (44% MnO) from one of the smelting tests was reduced with coke in an electric furnace to produce a ferro-manganese (82% Mn) alloy, the main form of Mn alloy used by the steel industry at that time.

10.2.1.2 Sumitomo

In the 1990s, Sumitomo[2] investigated a smelting flowsheet similar to Inco's for processing nodules. The nodules used had a high MnO: SiO_2 ratio of 3 giving an estimated slag liquidus temperature of about 1,530 °C. The nodules were crushed, dried at 110 °C to remove water not chemically bound, mixed with coal and flux and heated at 900 °C for two hours. The calcine was then smelted at 1,400 °C using 5% fixed carbon addition, as coal, and with additions of 12% SiO_2 and 7% CaO to minimise the liquidus. The results of the laboratory smelting tests are shown in Table 10.4.

[2] Tetsuyoshi Kohga et al, "Recovering Iron, Manganese, Copper, Cobalt, and High Purity Nickel from Polymetallic nodules", JOM, December 1995, p 40.

Table 10.4 Results of Sumitomo smelting tests

Element	Alloy (wt. %)	Recovery (%)	Slag (wt. %)
Ni	22.3	98.5	0.02
Cu	16.7	97.5	0.03
Co	5.4	96.8	0.01
Mn	0.22	0.05	31.3
Fe	55.0	62.1	2.79
Zn	0.01	3.2	<0.01
Mo	1.01	80	<0.1

The Ni, Cu and Co recoveries to the alloy were very high together with very little Mn reduction. After partial oxidation of the alloy to slag off the Mn and part of the Fe, the residual alloy was fully sulphidised with sulfur to convert all the Fe to FeS and then further converted to a purified matte and SO2, as shown in Table 10.5.

The purified Ni-Cu-Co matte was leached with Cl_2 gas and to extract 99% of the metals into a chloride pregnant liquor solution (PLS) containing: 145 g/L Ni, 74 g/L Cu, 11 g/L Co and 19 g/L Fe and a sulfur residue that would be recycled back to the converter for sulphidisation. Ni, Cu and Co metals were recovered from the chloride PLS by SX/EW and the Cl_2 gas recycled to the leach using the same processes as used at Sumitomo's Ni refinery.

Table 10.5 Composition of matte produced by Sumitomo

Element	Alloy (wt. %)	Recovery (%)
Ni	20.0	34.2
Cu	14.7	25.3
Co	4.83	4.05
Mn	<0.1	<0.1
Fe	34.7	10.8
S	33.2	25.7

The Mn slag from smelting was reduced in two stages: a first stage to remove Fe and P to produce a Fe-Mn alloy followed by a second stage to produce a SiMn alloy.

10.2.1.3 German Federal Institute for Geosciences and Natural Resources

Most recently, a German group conducted a study with the aim to develop "a sustainable, zero-waste process route to extract valuable metals from marine Mineral Resources" from the German licensed territory in the CCZ[3][4]*. After reviewing historical work conducted on possible hydrometallurgical and pyrometallurgical flowsheets, it was concluded that the pyrometallurgical flowsheet developed by Inco offered the most promise to treat manganese containing nodules.*

Subsequently, a preliminary thermodynamic model of the first smelting step of the Inco flowsheet was developed and validated against experimental data. The sample of the German nodules under investigation had a very high MnO: SiO_2 ratio of 3.2 with an estimated (FactSage) slag liquidus temperature of about 1550 °C. The thermodynamic model further estimated that the slag liquidus temperature decreases with MnO: SiO_2 ratio, as shown in Figure 10.2. The implications for the smelting step was that additions of silica could be used to lower the slag liquidus, allow the smelting to be conducted at a lower temperature and minimise the reduction of manganese.

3 D. Friedmann, A. K. Pophanken and B. Friedrich, "Pyrometallurgical Treatment of High Manganese Containing Deep Polymetallic nodules", J. Sustain. Metall., Published Online 18 July 2016.

4 Friedmann, D, et al, "Optimized slag design for maximum metal recovery during pyrometallurgical processing of polymetallic deep-polymetallic nodules", MOLTEN16, TMS 2016, p. 97-104.

Smelting tests were carried out using a 50 kW electric furnace with 3 kg mixtures of nodules, silica flux and carbon using MnO: SiO_2 ratios of 1.0, 2.0 and 3.2. The alloy and slag compositions from the tests are summarised in Table 10.6.

Figure 10.2 Estimated Slag Liquidus as a function of MnO_2/SiO_2 ratio

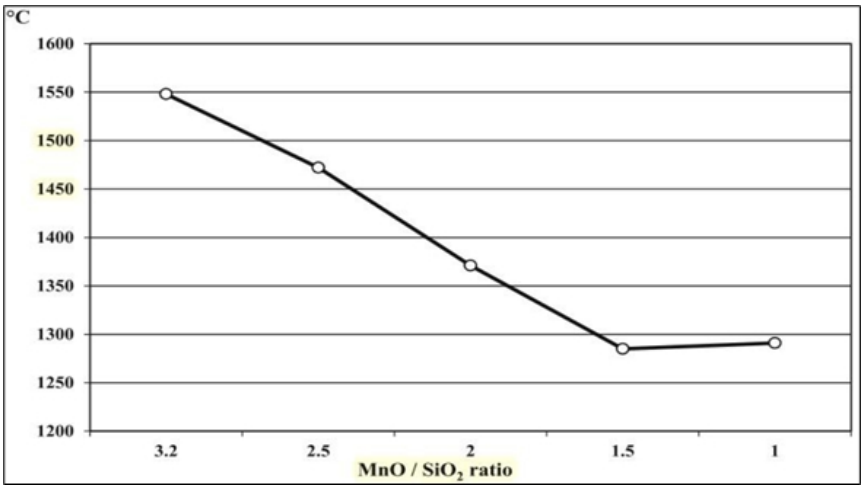


Table 10.6 Results from the German smelting tests

MnO / SiO2	Ni (%)	Cu (%)	Co (%)	Fe / FeO (%)	Mn / MnO (%)	SiO2 (%)	Temperature (^{0}C)
3.2 – alloy	13.4	9.1	0.7%	54.3	18.5	-	1650
3.2 - slag	0.5	0.7	-	9.4	55.3	14.7	
2.0 – alloy	17.0	12.7	1.9%	62.4	2.2	-	1450
2.0 - slag	-	-	-	3.5	47.4	31.0	
1.0 – alloy	17.8	10.8	2.0%	60.4	2.5	-	1400
1.0 - slag	0.1	0.2	-	3.0	38.0	41.0	

The results showed good general agreement with the predictions of the thermodynamic model and indicated that SiO_2 flux additions could be used to operate the smelting process at a temperature of 1400–1500^{o}C with minimum MnO reduction. The Ni recovery in all tests was >95%. Using the nodule, matte and slag compositions and assuming a Ni recovery to matte of 96.5%, the matte and slag weights and compositions were estimated together with the Ni, Cu, Co, Fe and Mn recoveries to alloy and the partition coefficients, as shown in Table 10.7. The estimated Cu and Co recoveries, based on the assumptions used to generate the mass balances, were significantly lower than the other data ranging from 76–84% for Cu and 43–92% for Co. These recoveries are hard to explain especially since the Ni recoveries to alloy and the Fe contents of the alloy and the amount of FeO reduced were consistently high in all tests.

Table 10.7 Partition coefficients from the German smelting tests

Stream	Wt.	Ni	Cu	Co	Fe	Mn
Nodules	100	1.36%	1.17%	0.16%	6.2%	31.2%
R=3.2 – alloy	9.8	13.4%	9.1%	0.7%	54.3%	18.5%
R=3.2 – slag	68.6	0.07%	0.41%	0.13%	1.3%	42.8%
R=3.2 – recovery to alloy		96.5%	76.2%	42.8%	85.8%	18.5%
R=3.2 – Dm/s		193	22	5	-	-
R=2.0 – alloy	7.7	17.0%	12.7%	1.9%	62.4%	2.2%
R=2.0 – slag	84.5	0.06%	0.22%	0.016%	1.6%	36.7%
R=2.0 – recovery to alloy		96.5%	83.8%	91.7%	77.7%	0.5%
R=2.0 – Dm/s		302	57	120	-	-
R=1.0 – alloy	7.4	17.8%	10.8%	2.0%	60.4%	2.5%
R=1.0 – slag	105.4	0.05%	0.37%	0.012%	1.7%	29.4%
R=1.0 – recovery to alloy		96.5%	68.1%	92.2%	71.8%	0.6%
R=1.0 – Dm/s		395	30	168	-	-

10.2.1.4 United States Bureau of Mines

The USBM studied smelting of nodules in the laboratory and carried out 35 reduction tests on 1.9 kg samples of nodules blended with 350 g silica and 100 g coke in SiC crucibles[5]. The reduction temperature was 1400 °C and the holding time was 1.5 hours. Two tests were also conducted on reducing the smelting test slag with lime flux additions at 1450 °C to form FeMn. The results of these tests are summarised in Table 10.8.

Table 10.8 Results of USBM Smelting Tests

Stream	Ni	Cu	Co	Fe	Mn
Nodules	1.33%	1.20%	0.23%	5.46%	29.7%
Smelted alloy	14.6%	12.4%	2.54%	48.6%	9.2%
Smelted slag	0.02%	0.03%	0.009%	0.3%	29.7%
FeMn alloy	0.17%	0.24%	0.03%	6.1%	75.1%
FeMn slag	<0.01	0.07	<0.001	0.07	5.35%

The USBM also tested 4 hydrometallurgical processes: Fluid-bed reduction; Cuprion ammoniacal leach process; High temperature pressure oxidation and Fluid-bed reduction & HCl leach. EPA toxicity tests were carried out on all the leach residues and slags from the processes. It was concluded that all the slags and tailings produced would be classified as non-hazardous as defined by the EPA toxicity test[6]. Although this is a very encouraging conclusion, it should be noted that this work was conducted in 1985 and it is recommended that further investigation of the current relevant regulatory guidelines be conducted and, as required, specific testing NORI materials be conducted.

5 Haynes, B.W., “Laboratory processing and characterization of waste materials from manganese nodules”, USBM RI 8938, 1985b.
6 Note by author: The EPA toxicity test and conclusions referenced above were based on the then current testing procedure and toxicity limits (from 1985).

10.2.1.5 Indian National Metallurgical Laboratory

The Indian nodule smelting tests were carried out in a 50 kVA rectangular electrode furnace using 20 kg batches of nodules blended with coke and silica[7]*. After melting an initial charge, the two graphite electrodes were immersed in the slag and the remaining charge gradually added. At the end of the test, the molten slag and alloy were tapped into a clay-graphite crucible and allowed to cool. The tests were carried out at slag temperatures in the range 1350-1450°C and with the amount of coke in the charge varying between 5 and 15%. The optimum conditions were found to be 7.5% coke at 1400 °C giving the highest recoveries to alloy of 94% Ni, 91% Cu and 78% Co, as shown in Table* 10.9*. These tests probably represent the best simulation for a potential commercial nodule smelting operation available from the literature.*

Table 10.9 Results of Indian smelting tests

Stream	Wt.	Ni	Cu	Co	Fe / FeO	Mn / MnO	Si / SiO2
Nodules	100	1.15%	1.10%	0.08%	5.4%	24.3%	13.1%
Alloy	7	15.4%	14.5%	0.8%	61.5%	3.9%	0.3%
Slag	71.8	0.04%	0.08%	0.01%	5.60%	43.20%	29.20%
Recovery to alloy		94%	91%	78%	80.6%	1.1%	
Dm/s		385	181	84			

10.2.2 Ni, Cu, and Co partition coefficients

The concept of partition coefficients is useful for assessing the efficiency of metallurgical processes. In the case of smelting reduction processes, the partition coefficient is the ratio of concentrations of a specific element in the metallic and slag (or matte and slag) phases. A high partition coefficient indicates efficient recovery of that element to the metallic phase and vice versa for a low partition coefficient.

10.2.2.1 Experimental test work

The Ni, Cu, and Co partition coefficients from the nodule smelting studies reviewed above are compared in Table 10.10 together with the recovery of iron to the alloy.

Table 10.10 Partition coefficients from sea nodule smelting tests

Partition coefficients				
Study	**Ni**	**Cu**	**Co**	**Fe to alloy**
Inco	396	154	194	87%
Japan	1115	557	540	70%
German	302	57	121	86%
Indian	385	181	84	80%
USBM	730	413	282	81%
Average	586	272	244	81%

7 Agarwal, S., et al, “Studies on recovery of Ni, Co, Cu from polymetallic polymetallic nodules by direct reduction smelting”, COM 2009, Sudbury, p. 509-517.

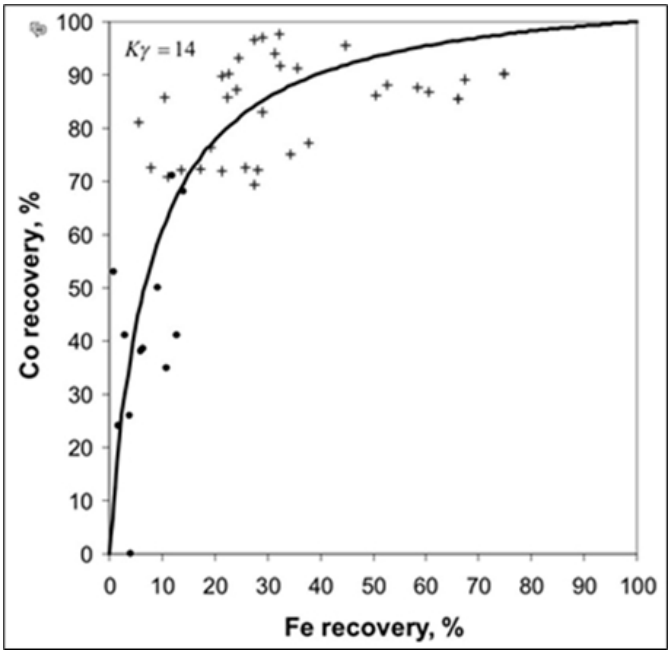
The partition coefficients for Ni, Cu and Co from these tests are very high ranging between 302–1115 for Ni, 57–557 for Cu and 84–540 for Co. These values are for well-controlled laboratory conditions with slow cooling in-situ that promotes excellent settling of the small alloy prills from the slag. The partition coefficients in a commercial operation, with less ideal settling conditions, would be expected to be lower.

Barnes[8] investigated the smelting of cobalt in a small-scale (120–250 kW) DC furnace from a fayalitic reverberatory furnace slag that contained approximately 0.75% Co and 1.2% Cu. The results showed a correlation between the Co and Fe recoveries to the metal, as illustrated in Figure 10.3.

10.2.2.2 Commercial furnace operation

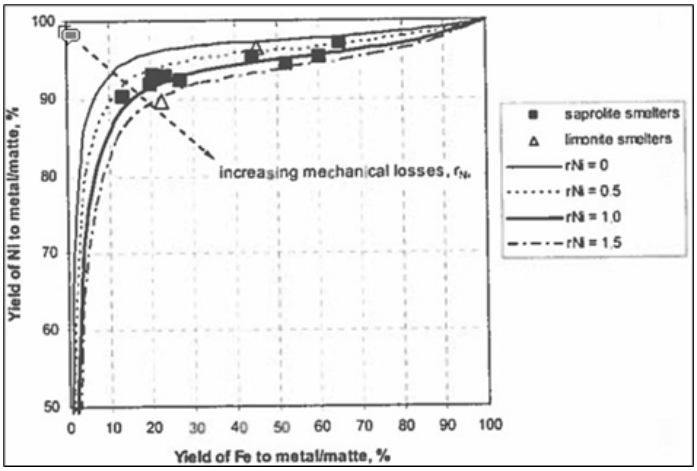
Solar[9] studied Ni/Co recovery from 11 FeNi smelting furnaces and found that Ni recoveries averaged 93.5% (range 89.6–97.0%) and Co recoveries averaged 71.9% (range 56.5-85.3%) corresponding to average partition coefficients of about 220 for Ni (range 155–264) and about 41 for Co (range 20–92). Solar also showed that Ni recovery to FeNi correlated well with the Fe recovery to the FeNi (range 13–65%), as shown in Figure 10.4.

Figure 10.3 Relationship between Co and Fe recoveries to alloy from Co smelting tests (Barnes)



8 Barnes, A., et al., “Cobalt from slag – Lessons in transition from laboratory to industry”, COM 2011, Montreal.
9 Solar, M., “Mechanical slag losses in laterite smelting – nickel”, COM 2009, Sudbury, p. 277-291

Figure 10.4 Relationship between Ni and Fe yields in laterite smelters, actual vs theoretical



There are insignificant amounts of Cu in the laterite feeds to FeNi furnaces and the best data for the partition coefficient for Cu is from various Cu and Ni smelter slag reduction electric furnaces. The most pertinent data that could be found from Cu and Ni smelter slag reduction furnaces is summarised in Table 10.11.

Table 10.11 Partition coefficients from various Cu and Ni slag reduction electric furnaces

Data from	**EF matte/alloy (%)**					**EF slag (%)**				**Partition coefficient**		
Harjavalta smelter[10]	Ni	Cu	Co	Fe	S	Ni	Cu	Co	Fe	Ni	Cu	Co
Harjavalta Old Ni smelter EF	45	12	-	25	8	0.2	0.3	-	40	225	40	-
Harjavalta DON smelter EF	52	5	-	30	8	0.3	0.1	-	43	173	50	12
Mintek EF[11]	42	19	1.5	33	1	0.3	0.5	0.12	37	140	38	12
Konkola 2nd EF[12]	-	65	5	20	8	-	0.5	0.3	40	-	130	17
Amax Carteret EF[13]	8	25	-	60	-	0.1	0.3	-	30	80	83	-

The Cu partition coefficients range from 40 to 130 with an average of about 75. The Ni and Co partition coefficients are lower than those from FeNi smelters presumably because of the significantly lower Fe recovery to the alloy / matte phase.

10 Mackinen, T., et al, “Physical chemistry of direct nickel matte smelting”, Sulphide Smelting ’98, TMS, p. 59-68.
11 Jones, RT., “CONROAST – DC arc smelting of dead-roasted sulphide concentrates”, Sulphide Smelting 2002, TMS, p. 435-56
12 Masanza, M.K., et al., “Commissioning of a second cobalt recovery furnace at Nchanga smelter”, 5th International Symposium on high-temperature metallurgical processes, TMS 2014, p. 217-27.
13 Rajcevic, H., et al., “Development of electric furnace slag cleaning at a secondary copper smelter”, J. Metals, March 1982, p. 54-56.

10.2.2.3 Partition coefficients assumed for plant design criteria

Based on Solar's and Barnes evaluations, the % of Fe input reduced to Fe in alloy in the nodule smelting tests should give the best correlation for Ni and Co recovery. The average % Fe reduction in the nodule smelting tests summarised in Table 10.10 was about 80%. This is higher than any of the FeNi plants. Using Solar's correlation at 80% Fe recovery to alloy, the Ni recovery should be about 97%, equivalent to a partition coefficient for Ni of about 285 based on a preliminary nodule smelting mass balance. This is about half of the average Ni partition coefficient from the laboratory nodule smelting tests, shown in Table 10.10*, and in agreement with the assumption that mechanical Ni losses in an industrial furnace will be roughly equal to the chemical NiO losses. Based on a similar mechanical loss assumption for Cu and Co, their partition coefficients would be 130 and 120 respectively.*

10.2.3 Mn reduction during smelting

The recovery of Mn to the alloy for most of the nodule smelting tests was in the range 0.5-1.0% except for the USBM tests (2.8% Mn reduction), where CaO flux was added, and the German test without flux (5.8% Mn reduction) that required a temperature >1600 °C. The conditions used in both of these tests would have significantly increased MnO reduction.

The nodule smelting tests suggest that to minimise reduction of Mn and to produce the highest Mn grade in slag, only sufficient SiO_2 flux should be added to the nodules to produce a MnO/SiO_2 ratio in slag of about 2.2, giving a slag liquidus of about 1400 °C, such that the smelting furnace can be operated at a temperature of about 1500 °C to minimise MnO reduction and produce a fluid slag to reduce mechanical metal losses and facilitate tapping.

Based on the results of the nodule smelting tests it is reasonable to assume that reduction of MnO could maintained at < 1%.[14]

10.2.4 Processing of the EF alloy in Peirce-Smith converters

Both the Inco and Japanese studies proposed processes where the alloy would be converted into a HG[15] *Ni-Cu-Co matte containing 5–10% Fe using Peirce Smith (PS) converters. To maintain high sulfur usage efficiency during this process, the manganese must first be eliminated prior to sulphiding the alloy. This is achieved by oxidising the molten alloy to lower its manganese content to <0.1% and fluxing with silica. The alloy is then sulphided with elemental sulfur and the sulphided bath converted using the standard method to eliminate iron as an iron silicate slag. It was found that the nickel and copper values in the slag in the early stages of converting were low enough that the slag could be discarded. The cobalt recovery in the matte was found to depend on the level of Fe remaining in the matte. The HG matte after converting typically contained: ~25% Cu, ~40% Ni, ~5% Co, ~% Fe, ~20-25% S, <0.01% Mn. There was insufficient data on converting in the Inco nodule smelting paper to determine metal distributions, but the paper reported 80% Co recovery to a 5% Fe matte and very high Ni and Cu recoveries.*

The Inco study demonstrates that it is possible to produce a 5% Fe HG matte from polymetallic nodules. However, it is believed that HG matte containing 1% Fe would be more readily marketed and would receive higher contained metal valuation. The best industrial plant data for converting highly metallised Ni mattes is from the PT Vale Indonesia Soroako nickel smelter[16] *and the converter balance is summarised in Table 10.12. The matte is processed in 3 PS converters (9 m long × 4 m dia.) blowing at about 18,000 Nm^3/h. A typical converter cycle takes about 7 hours to produce about 50 t of HG matte (1% Fe). It should be noted that the recovery of Co to the matte at the Soroako smelter is purposely maintained low as Co is not desired in the product.*

14 Note by author: For the purposes of the PEA, MnO reduction of 1% was assumed as a reasonable basis.
15 Note by author: HG = High Grade.
16 Crundwell, F., et al., "Extractive metallurgy of nickel, cobalt and platinum group metals", Elseveir 2011, p. 103.

Table 10.12 Converter mass balance from Soroako nickel smelter

	tpd	Ni	Co	Fe	S
Matte	909.2	26.0%	0.80%	63.0%	10.0%
Partition coefficient		236	7.3	573	91
Slag	900	2.0%	0.60%	53.0%	
Partition coefficient		18.0	5.4	477.0	
HG matte	280	78.0%	1.00%	1.0%	20.0%
Partition coefficient		218.4	2.8	2.8	2.8
Recovery		**92.4%**	**38.5%**		

The best industrial plant data for Cu distribution in metallised Ni-Cu matte converting is from Glencore's Falconbridge Ni-Cu smelter[17]*. This data is shown in Table 10.13 and is compared with the partition coefficients calculated from the laboratory converting data in the Japanese nodule smelting paper and data from Vale's Thompson Ni smelter*[18]*.*

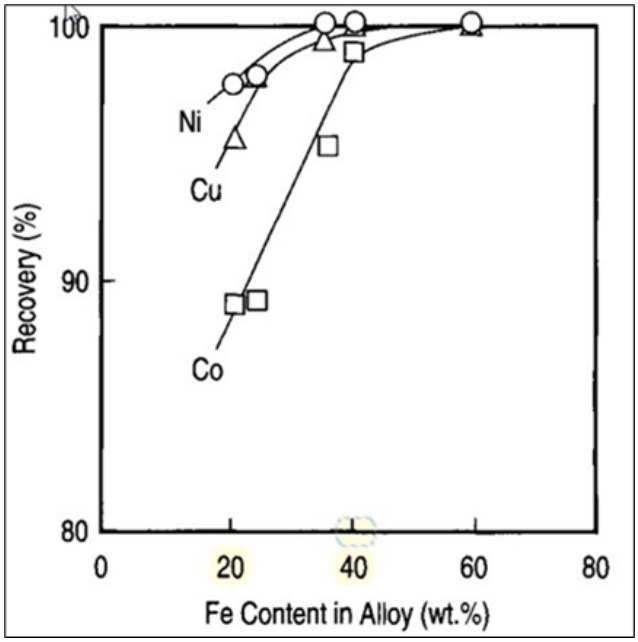
Table 10.13 Comparison of partition coefficients during matte converting

% Fe in matte	Partition coefficients							
	Falconbridge			Thompson		Japanese		
	Ni	Cu	Co	Ni	Co	Ni	Cu	Co
40%	-	-	-	-	-	230	150	75
30%	40	30	3.5	250	-	150	70	15
20%	40	30	3.5	150	7.5	36	18	6
10%	30	25	2.5	75	3.4			
5%	20	20	1.5	40	1.4	13	5	3

The Thompson Ni data is for oxidic Ni only. The Ni, Cu and Co partition coefficients for the Japanese laboratory study were estimated from their metal recovery data presented in Figure 10.5. These were adjusted to account for higher entrained losses in industrial practice to give recoveries to alloy of 99.0% Ni, 98.5% Cu and 97% Co when converting the alloy down to about 40% Fe.

17 Bustos, A., et al., "Converting simulation at Falconbridge Limited", Extractive metallurgy of nickel and copper, TMS, 1988, p. 335-53.
18 Diaz, C., et al., "A review of nickel pyrometallurgical operations" Extractive metallurgy of nickel and copper, TMS, 1988, p. 211-39.

Figure 10.5 Metal recovery versus iron content in alloy during converting (Japanese study)



Overall, it is concluded that it would be feasible to produce a HG matte with 1% Fe from the NORI polymetallic nodules and that data from analogous industrial operations can be used to prepare preliminary design criteria.

10.2.5 Hydrometallurgical processing of Ni-Cu-Co matte

There are several methods of leaching Ni-Cu-Co mattes to recover the valuable metals. The simplest process is that proposed by Inco[19] in which the finely ground matte (99% minus 45 microns) would be leached with sulfuric acid an autoclave operating at about 110 °C to dissolve the Ni, Cu, Co, and Fe. In the laboratory batch leach tests, Inco used the following conditions:

- *Matte solids density of 9%.*
- *150 psi O_2.*
- *100 g/L of acid (85-90% stoichiometric acid requirement).*

These tests achieved 99% extraction of Ni, Cu, Co and Fe in 2 hours with 99% S conversion to sulfate. The PLS contained about 20 g/L acid and 5 g/L Fe (50% Fe^{2+}). This was neutralised with limestone to pH 3.5 and SO_2/air injection used to oxidise all the Fe to Fe3+ and to precipitate Fe down to about 10 mg/L Fe as a stable ferrihydite / gypsum precipitate. After solid-liquid separation and washing, this residue could be ponded. The PLS after Fe removal contained: 40 g/L Ni, 24 g/L Cu and 5 g/L Co.

19 R. Sridhar, W. E. Jones, and J. S. Warner, "Extraction of copper, nickel and cobalt from polymetallic nodules", JOM, April 1976, p 32.

The Fe in the PLS can also be precipitated in the autoclave as jarosite or hematite under different operating conditions and both alternatives have been operated commercially in Ni refineries. For example, the Rustenberg refinery[20] used to precipitate its Fe as sodium jarosite but it now operates its pressure oxidation process at a slightly higher temperature of about 150^{o}C to precipitate the Fe from solution as hematite. This process gives a higher 99% Ni, Ci, Co extraction, a small amount of high Fe residue (>50% Fe) as well as lower Fe and acid in the resultant PLS. The leach residue could be recycled to the converters to maximise residual metal recovery.

There are two several proven methods for extracting the Ni, Cu and Co values from the PLS. Firstly, treatment with H_2S could be used to precipitate a pure Cu sulphide and a mixed Ni/Co sulphide. Alternatively, the PLS could be processed using solvent extraction (SX) and electrowinning (EW) to recover Cu as cathode copper before recovering the Ni and Co from solution as a mixed sulphide precipitate.[21]

10.3 NORI Test Work and Piloting

NORI has embarked on an extensive program of test work at various scales in support of process development for the project. To date, small scale pyrometallurgical tests (of the order of up to kilograms of material) have been undertaken and larger scale piloting of the pyrometallurgical process has commenced with calcining approximately 70 t of nodules. Hydrometallurgical test work will follow once sufficient matte has been generated to provide feed.

NORI has retained the services of three main facilities to conduct the pyrometallurgical work:

- Kingston Process Metallurgy (KPM): Small scale calcining and smelting work
- FLSmidth: Preliminary material characterization and calcining; pilot scale calcining (0.9 m diameter x 15 m long)
- Expert Process Systems (XPS): Preliminary converting tests, pilot scale smelting, sulfidation and converting.

The over-arching objectives of the program are:

- To demonstrate at small and pilot scale the viability of the chosen process
- To measure important parameters for engineering design.

To date, results do not appear to be in any significant disagreement with the process definition as originally based on the literature review. One of the more notable findings arising from test work and investigation performed to date is that the higher oxides of manganese thermally decompose, even in the presence of carbonaceous reductant, thus reducing the amount of reductant required. In addition, the test work program has generated information that was not previously available (e.g., certain elemental deportments). Where appropriate, this information has been incorporated into the process design.

20 Hofirek, Z. et al., “Pressure leach capacity expansion using oxygen-enriched air at RBMR Rustenburg Base Metal Refiners”, Hydrometallurgy, 39, 1995, 91-116.

21 Note by author: A third option is to remove copper via EW and separate the nickel and cobalt via SX. Supplementary purification can be done to allow the nickel and cobalt streams to be processed either via EW to create nickel and cobalt cathode, or with crystallization to produce nickel and cobalt sulphates.

10.3.1 Preliminary Work at FLSmidth

Early work at FLSmidth included:

- Measurement of physical properties, e.g.,
  - Free moisture content
  - Specific gravity
  - Bulk density
  - Particle size distribution
- Differential Thermal Analysis (DTA)
- Sintering tests
- Batch kiln reduction calcining (0.3 m diameter x 1 m long)
- Speciation (oxidation states) of manganese, iron, nickel in nodules and calcine
- Tumble tests.

Some of the key findings have been:

- Both the batch kiln and sintering tests indicate that sintering temperatures are well above the target commercial operating temperature of 900 °C.
- A high degree of reduction of iron and nickel (to metal) can be achieved during calcination as well as almost complete decomposition and reduction of manganese oxides to Mn^{2+}.
- Results from the tumble test suggest that calcining the nodules in a commercial rotary kiln should incur less dust generation than a nickel laterite operation.

10.3.2 KPM Work

The test work at KPM has been supplemented by thermodynamic modelling, which is providing very useful insights into the process as well as calculation of important parameters.

The primary work at KPM involved calcining and smelting at two relatively small scales:

- 100 g, using a small batch kiln for calcining and a small induction furnace for smelting.
- 1–1.5 kg using a larger induction furnace for both calcining and smelting.

Additional work was completed to further understand the speciation, thermal decomposition and reduction behaviour of manganese oxides in the nodules.

Alloy liquidus temperature was measured using DTA and the slag liquidus was mapped out by thermodynamic modelling.

Some of the key findings have been:

- The calcining and smelting work at KPM has demonstrated that, in addition to making an alloy of the expected composition for further processing, it is possible to make a slag phase that is low in Cu, Ni and Co and, importantly for saleability as a product, low in phosphorus.
- Tests were carried out under various conditions—in particular the amount of reductant was varied and this revealed that:
  - Less reductant was required than had been predicted by the process model. This led to the investigation into manganese oxide behaviour.

- The metallurgical outcome is quite sensitive to the amount of reductant added and design of the commercial plant must recognize this.

- One of the best-outcome tests was reviewed for metal deportments, which were found to be in reasonable agreement with the process model values. Some key additional information was added to the model.

- The slag and metal liquidus' were such that the process model design temperatures could be confirmed.

- The understanding gained from the manganese investigation has been incorporated into the process model, resulting in a prediction of lower reductant requirements.

10.3.3 Small Scale Work at XPS

The preliminary work at XPS focused on the converting part of the proposed process. A significant part of the objectives for this early work is to establish experimental techniques that can be carried into the pilot scale work for this challenging part of the process flowsheet.

Two types of testing have been carried out so far:

- Converting an artificial matte.

- Removing manganese and adding sulphur to make matte, using an artificial alloy (corresponding to the electric furnace product in the proposed process).

A 30 kW induction furnace was used for the work, melting charges in the 2–10 kg range.

10.3.3.1 Converting of Artificial Matte

An artificial matte was made by melting various components such as pig iron, local nickel matte, manganese powder, etc. Only the main elemental components of metallurgical significance were included in the recipe. The target matte composition was calculated to subsequently pass along the expected converting path for the matte targeted in the commercial operation. The matte was successfully made in an induction furnace and it was then blown down (converted) to a matte containing only 5% iron using a silicon carbide lance immersed in the melt. Silica flux was added to form a fayalite slag of an appropriate iron/silica ratio.

In addition to establishing experimental methodologies, the work provided valuable information on the deportment of elements of interest between matte and slag. While there is deportment information on elements such as Ni, Cu and Co from the non-ferrous industry, others, such as Mn and phosphorus, are not as well understood. The work generated preliminary partition coefficients for elements of interest as a function of iron in matte that were included in the process model. This improves understanding of the implications of different set points for intermediate and final matte iron levels on pay-metal recovery and residual unwanted elements.

10.3.3.2 Manganese Removal and Sulphidation

The proposed pilot-scale work at XPS is to receive calcined nodules from FLS and first smelt them to an alloy, then to sulphidize to a matte and convert to a final matte for hydrometallurgical processing. In the proposed commercial operation, sulphur will be introduced to the molten material in liquid form, per the practice at SLN's Doniambo operation prior to 2016. This was considered to be impractical with the proposed equipment set-up available at XPS. Instead, sulphur can be added in the form of sulphur-bearing compounds. Both pyrrhotite and pyrite were tested, with additions being to the surface and by submerged injection via a lance.

Addition of pyrrhotite via lance injection was the most successful in terms of sulphur efficiency. The additional iron units will simply lengthen the converting time somewhat.

The alloy from the smelting process is expected to contain a few per cent manganese. Manganese is known to form a separate phase (in addition to matte and slag) in the presence of significant amounts of sulphur. This phase is described as ‘mushy’ at converting temperatures and may pose some complications for the pilot work. It may be desirable to remove the manganese from the alloy before adding sulphur. (It is unlikely that this will be an issue for the proposed commercial operation, with alloy addition being made to intermediate matte.)

Tests were conducted to blow out the manganese using a lance and silica flux prior to adding sulphur. The work demonstrated that manganese levels can be lowered in metal and captured in slag, however, if the slag remains in the vessel when sulphur is then added, the ‘mushy’ phase will still manifest.

11 Mineral Resource estimates

Mineral Resources were first estimated for NORI Areas A, B, C and D by Golder Associates in late 2012 (Golder, 2013), primarily using data collected by the Pioneer Investors. Data collected by NORI in 2018 was used by AMC Consultants Pty Ltd to update the Mineral Resource estimate for NORI Area D in 2018, and data collected in 2019 was used to update the Mineral Resource estimate in 2020. The estimates of the combined Mineral Resources in NORI Areas A, B, C, and D are summarized in Table 11.1. This IA only considers development of NORI Area D. The cut-off of 4 kg/m^2 abundance is derived from the estimates of costs and revenues presented in this Initial Assessment.

Table 11.1 NORI 2020 Mineral Resource estimate, in situ, for the NORI Areas within the CCZ at 4 kg/m^2 nodule cut-off.

NORI Area	Category	Tonnes	Abundance	Nickel	Copper	Cobalt	Mn	Silicon
		(Mt (wet))	(wet kg/m^2)	(%)	(%)	(%)	(%)	(%)
D	Measured	4	18.6	1.42	1.16	0.13	32.2	5.1
D	Indicated	341	17.1	1.4	1.14	0.14	31.2	5.5
D	Measured + Indicated	345	17.1	1.40	1.14	0.14	31.2	5.5
D	Inferred	11	15.6	1.38	1.14	0.12	31.0	5.5
A	Inferred	72	9.4	1.35	1.06	0.22	28.0	-
B	Inferred	36	11	1.43	1.13	0.25	28.9	-
C	Inferred	402	11	1.26	1.03	0.21	28.3	-

The estimates for NORI Areas A, B and C are the NORI 2012 estimates (Golder 2015). Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

Abbreviations used for statistical terms in this section are: Min = minimum, Max = maximum, Var = variance, CV = coefficient of variation.

11.1 Polymetallic nodule sample data

All polymetallic nodule sample data (historic box-core and free-fall grab samples, and the NORI 2018 box-core) and the abundance estimates derived from photographs were combined into a single data set. The data set contains assays for nickel (%), copper (%), manganese (%), cobalt (%), silicon (%), iron (%) and phosphorus (%), and measurements of nodule abundance (kg/m^2).

11.1.1 Historic sample data

Historic data provided by the ISA and BGR to NORI included 392 samples (Table 11.2). The data includes measurement of nodule abundance (kg/m^2) and the assays manganese (%), cobalt (%), nickel (%) and copper (%). The data were checked for anomalous or erroneous data and cross-checked with data supplied directly by the ISA.

Table 11.2 Summary statistics of historic polymetallic nodule data within NORI Areas A, B, C and D used for the 2012 Mineral Resource estimate

Variable	Samples	Missing	Min	Max	Mean	Var	CV	Median
Ni (%)	360	32	0.68	1.75	1.30	0.016	0.10	1.31
Co (%)	360	32	0.05	0.33	0.17	0.004	0.35	0.19
Cu (%)	360	32	0.40	1.50	1.10	0.028	0.15	1.13
Mn (%)	360	32	12.84	33.90	29.45	8.406	0.10	30.20
Abundance (wet kg/m^2)	392	0	0	52.2	11.9	64.303	0.67	12.00

Source: Golder 2015. Var = variance; CV = coefficient of variation

11.1.2 TOML sample data

TOML Area F is adjacent to the western border of NORI Area D. In 2020, NORI acquired the data from this area, including 26 nodule samples (1 historic sample and 25 samples collected by Nautilus Minerals Inc.). The TOML data includes measurements for abundance (kg/m^2) and assays for manganese (%), nickel (%), copper (%) and cobalt (%). All assays were converted from oxides to elemental values. AMC included this data for estimating the NORI Area D mineral resource because it provides more control of abundance and grade estimates along the western margin of NORI Area D. Summary statistics are presented in Table 11.3.

Table 11.3 Summary statistics of TOML Area F polymetallic nodule assays

Variable	Samples	Missing	Min	Max	Mean	Median	Var	CV
Ni (%)	26	0	1.05	1.51	1.41	1.42	0.008	0.06
Co (%)	26	0	0.09	0.17	0.13	0.13	0.000	0.14
Cu (%)	26	0	1.10	1.35	1.24	1.23	0.005	0.06
Mn (%)	26	0	30.1	33.6	32.2	32.4	0.813	0.03
Abundance (wet kg/m^2)	26	0	1.2	29.1	17.9	18.1	45.359	0.38

11.1.3 NORI 2018 sample data

NORI Campaign 3, in 2018, focused on collecting close spaced (7 km by 7 km spacing) box core samples, supplemented by seafloor photography in an area selected for trial mining.

Forty-five sites were sampled with a box core. The assay data set includes 45 primary box core samples Table 11.4 and a further 87 duplicates, standards, blanks and other samples. The data includes a suite of multivariate assays which including manganese, copper, nickel, cobalt, silicon, iron and phosphorus. The primary sample assays were used for resource estimation. The duplicate sample data were included in the variography because they provide information about the nugget variance.

During the NORI 2018 campaign, seafloor photographs were captured along with the box-core sampling. The photographs were used to estimate nodule abundance from the relationships between nodule long-axis length, the percentage of the photo covered by identified nodules, and nodule weight. Fourteen (14) seafloor photographs within the Measured Mineral Resource boundary were used to estimate nodule abundance.

Table 11.4 Summary statistics of the 2018 NORI Area D primary assay data.

	Number	Missing	Min	Max	Range	Mean	Median	Var	CV
Abundance (wet kg/m^2)	45	1	6.50	29.90	23.40	18.00	18.10	23.694	0.2700
Nickel (%)	45	0	1.18	1.45	0.27	1.37	1.39	0.004	0.0455
Copper (%)	45	0	0.97	1.34	0.38	1.15	1.14	0.005	0.0614
Cobalt (%)	45	0	0.09	0.15	0.05	0.13	0.13	0.000	0.1010
Manganese (%)	45	0	26.44	34.33	7.88	31.28	31.69	2.557	0.0511
Silicon (%)	45	0	4.81	8.06	3.25	5.53	5.34	0.420	0.1170
Iron (%)	45	0	4.27	8.21	3.94	6.66	6.86	0.696	0.1250
Phosphorus (%)	45	0	0.12	0.25	0.13	0.16	0.15	0.001	0.1460

11.1.4 NORI 2019 sample data

NORI Campaigns 6A and 6B, in 2019, focused on upgrading the NORI Area D Inferred Mineral Resource to Indicated Mineral Resource by collecting close spaced (10 km by 10 km spacing) box core samples.

Box core sampling was attempted at a total of 106 sites in the NORI Area D license area during Campaign 6A and 101 sites during Campaign 6B. Disturbed samples, considered to be unreliable, were omitted from the sample sequence. Summary statistics for the remaining 207 primary box core samples are presented in Table 11.5.

The data includes a suite of multivariate assays which include manganese, copper, nickel, cobalt, silicon, iron, and phosphorus.

Table 11.5 Summary statistics of the 2019 NORI Area D primary assay data.

	Number	Missing	Min	Max	Range	Mean	Median	Var	CV
Abundance (wet kg/m^2)	207	0	0.08	32.99	32.92	17.55	17.13	28.98	0.3070
Nickel (%)	207	4	0.91	1.49	0.57	1.38	1.40	0.006	0.0558
Copper (%)	207	4	0.77	1.41	0.65	1.15	1.14	0.007	0.0721
Cobalt (%)	207	4	0.09	0.45	0.36	0.14	0.13	0.001	0.2130
Manganese (%)	207	4	24.23	34.46	10.24	30.95	31.19	2.543	0.0515
Silicon (%)	207	4	4.74	8.97	4.23	5.61	5.39	0.472	0.1220
Iron (%)	207	4	3.81	11.16	7.35	6.73	6.81	0.704	0.1250
Phosphorus (%)	207	4	0.11	0.51	0.40	0.16	0.15	0.002	0.2640

11.1.5 Representativeness of sampling

Comparison of the seafloor photographs at the box core sites and the observed distribution of nodules in the box cores indicated that the box core samples were largely undisturbed and representative of the sampled locations.

Sampling in 2018 and 2019 confirmed the earlier assessment of continuity of grade and nodule abundance. Continuity of grades and abundance between sample points can be reasonably assumed for the following reasons:

- Statistics of the nodule samples within the reserve blocks of the CCZ show a very low coefficient of variation, which indicates a low risk in estimating and interpolating grades.
- Variography of the samples within the NORI Area shows reasonable spatial continuity with ranges greater than the average sample spacing for nickel, copper, cobalt, and manganese. Abundance has a more erratic variogram with shorter ranges.
- The continental scale of the deposit and mode of formation leads to the expectation of low variability.

The sample density and spacing within the NORI Area are sufficient to demonstrate continuity of nickel, copper, cobalt, and manganese. The reprocessed backscatter data and the low-level seafloor photography from the 2018 campaign indicate strong continuity of nodule abundance across NORI Area D.

11.1.6 Data integration

The historic, TOML and NORI nodule sample data were combined into a single data set. The combined data set (Areas A, B, C and D) contains 1299 records. This data includes both the primary assays and duplicated primary assays.

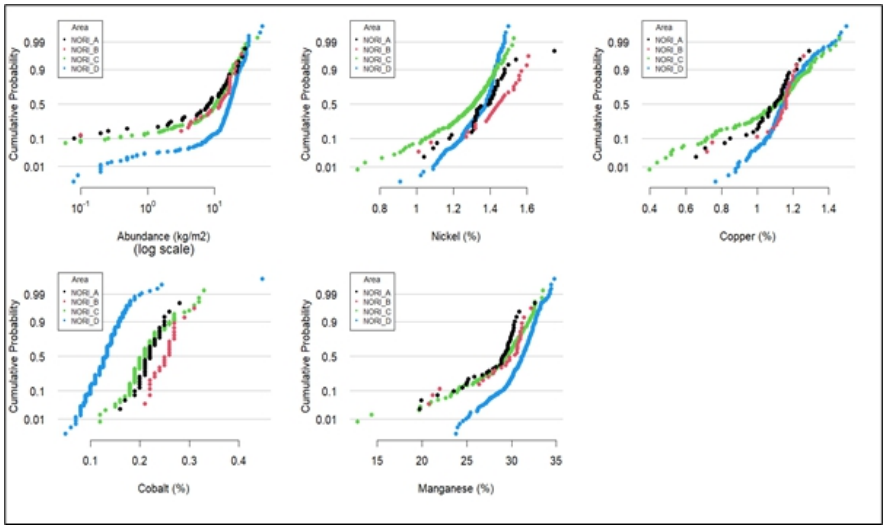
Summary statistics for all manganese nodule data within NORI Areas, including the nodule abundance estimated from photographs for NORI Area D and the duplicate samples, are listed in Table 11.6. Note the very low coefficient of variation for nickel, copper, manganese and cobalt.

Table 11.6 Summary of all manganese nodule data within NORI Area D

	Number	Missing	Min	Max	Mean	Median	Var	CV
Abundance (wet kg/m^2)	763	1	0.00	52.20	14.77	15.50	54.898	0.5020
Nickel (%)	763	50	0.68	1.75	1.34	1.37	0.012	0.0833
Copper (%)	763	50	0.40	1.50	1.12	1.14	0.018	0.1180
Cobalt (%)	763	50	0.05	0.45	0.16	0.14	0.003	0.3220
Manganese (%)	763	50	12.84	34.80	30.27	30.84	6.217	0.0824
Silicon (%)	763	410	4.70	9.00	5.60	5.40	0.463	0.1210
Iron (%)	763	410	3.80	11.20	6.70	6.80	0.720	0.1260
Phosphorus (%)	763	410	0.10	0.50	0.20	0.20	0.001	0.2300

Cumulative probability plots of the polymetallic nodule sample data within the NORI Areas are provided in Figure 11.1. The plots show that the distributions for nodule abundance and the assays manganese, cobalt, nickel and copper are different across the NORI Areas. The biggest differences are exhibited in the cobalt distributions with Area D being significantly lower than Areas A, B and C. The plots also show that there are only a couple of potential outliers (extreme values) including a high nickel assay (>1.6% Ni) from Area A and low manganese values (<15% Mn) from Area C. NORI Areas A, B and C show very similar distributions for abundance, manganese, cobalt, nickel and copper.

Figure 11.1 Cumulative probability plots of abundance and assays for the integrated sample data



11.2 NORI Area D

11.2.1 Geological domains

Geological interpretation and definition of geological and geomorphological domains were completed by Ian Stevenson of Margin - Marine Geoscience Innovation, using the bathymetry and backscatter data sets.

Domains include abyssal plains, abyssal hills, high seafloor slope, volcanic outcrops and discrete volcanic cones. The abyssal hills and slope domains have been separated on the basis of whether the box core sampling indicates a hard substrate or not.

Analysis of land-out video footage, AUV camera data and AUV sub-bottom profiler showed a good correlation between slopes steeper than 6° and the presence of hard ground where there were a high number of failed box core recoveries (21 sites). Areas where the slope gradient exceeds 6° were assumed to be too steep for nodule collection and were excluded from the Mineral Resource estimate, as shown in Figure 11.2. The steep slope domain covers only 6% of NORI Area D.

Volcanic outcrop occurs frequently along and parallel to the ridges and frequently occur along the margins between the abyssal hill and abyssal plain domains. Volcanic cones are found mostly along the southern margin of NORI Area D, in a line running roughly east-west. The volcanic domains are interpreted to be rugged and to carry few nodules. They have been excluded from the Mineral Resource.

NORI Area D is dominated by the abyssal plains domain which covers 68.6% of the area. The areas that are considered unlikely for harvesting (high slope and volcanic domains) cover 16.9% of NORI Area D. The proportions of the various domains are shown graphically in Figure 11.3.

Figure 11.2 Map of NORI Area D geological domains.

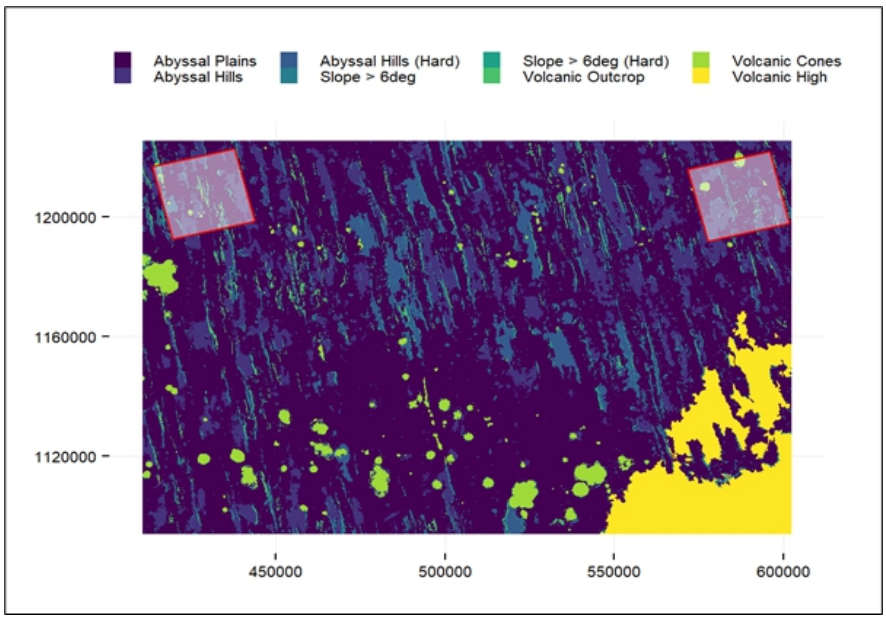
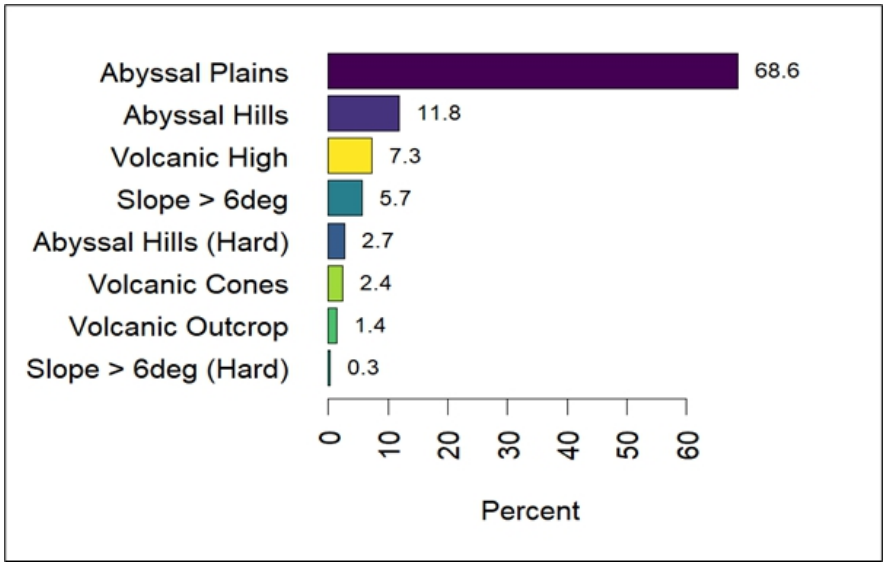


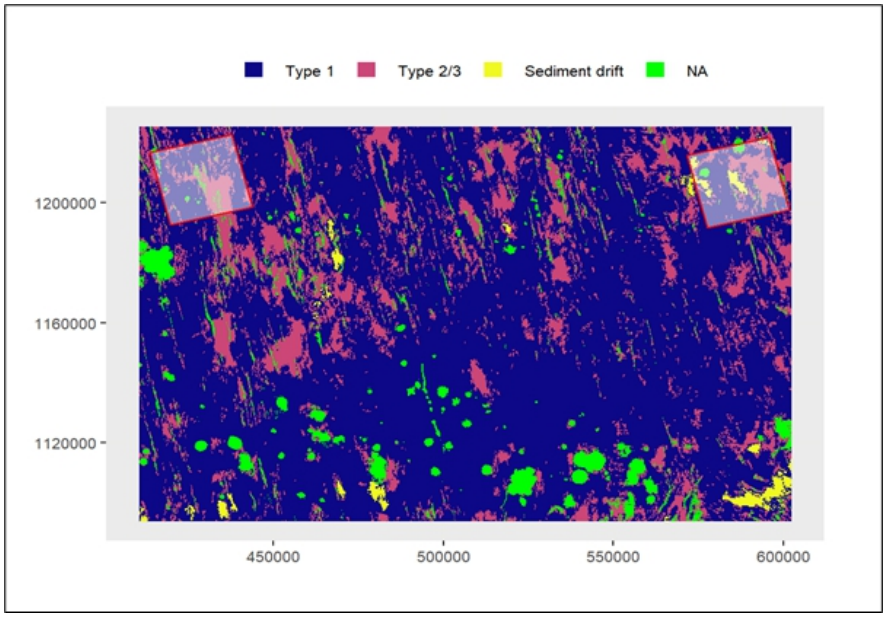
Figure 11.3 Proportions of geological domains in NORI Area D



11.2.2 Nodule type and sediment drift

Nodule type (Type 1 and Type 2/3) areas and areas covered by sediment drift were interpreted from the backscatter data and the box core land out videos and box core logging. The distribution of nodule types is shown in Figure 11.4. The areas marked as “NA” are volcanic areas where the presence of nodules is not confirmed.

Figure 11.4 NORI Area D nodule type domains.



The larger Type 2 and 3 nodules only cover approximately 17% of NORI Area D. The smaller Type 1 nodules are the most common nodule type across NORI Area D, covering approximately 78% of the area. The sediment drift domain, a soft sediment ooze with low backscatter, is rare within NORI Area D. A large proportion of the sediment drift occurs in the volcanic high areas. The impact of the sediment drift domain on the mineral resource estimate is considered to be negligible. The areas marked as “NA” are volcanic areas where the presence of nodules is not confirmed.

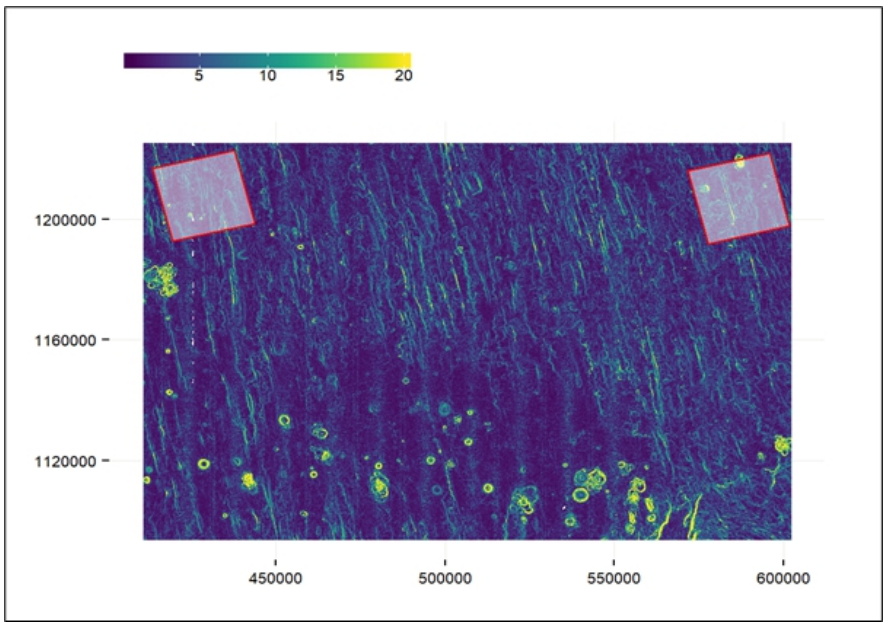
11.2.3 Backscatter

The backscatter data was collected during 2012 and reprocessed in 2018. The data was collected on 20 m by 20 m resolution over the area from 405215.4 mE to 606235.4 mE and from 1087387 mN to 1240007 mN. The backscatter data was converted to the same resolution and extent as the interpreted geological domains to allow direct comparison between datasets.

11.2.4 Bathymetry

The bathymetry data was collected during 2012 and reprocessed in 2018. The data was collected on 50 m by 50 m resolution over the area from 405694.2 mE to 606294.2 mE and from 1086099 mN to 1240249 mN. The bathymetry data was converted to the same extent as the interpreted geological domains to allow direct comparison between datasets. Additional layers representing slope angle Figure 11.5 and aspect, in degrees, were calculated from the bathymetry and then added as separate raster layers to the bathymetry raster.

Figure 11.5 NORI Area D slope angle



11.2.5 PRZ areas

NORI is considering the location of areas that may, in future, be designated as Preservation Reference Zones (PRZ) for the preservation of biological diversity. Two possible locations for PRZs are shown on the Figures in this report e.g., Figure 11.5. Their locations are not yet finalized, and they may be repositioned. For this reason. the PRZ areas are included in the resource estimate. It is anticipated that the areas finally selected as PRZs will be excised from the Mineral Reserves when they are estimated.

11.2.6 Data processing

For estimation of resources in the NORI Area D, the integrated NORI data was filtered to only include NORI Area D and TOML Area F samples. The combined data set contains 556 records of which 26 records are from TOML Area F Figure 11.6. Further preparation of the nodule sample data included:

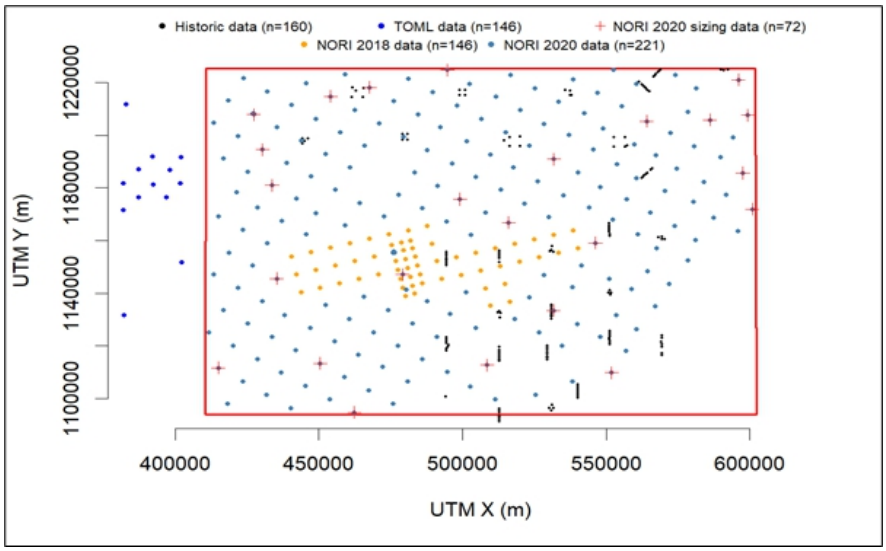
- Calculate average values for duplicate pairs of box core samples.
- Combine clustered historic samples.
- Check for outliers.
- Assign domains.
- Apply top cuts.

The grades that comprise the polymetallic nodules have a unit sum constraint. That is, the sum of the elements (including oxygen and hydrogen) is 100%. Consequently, the elements of interest in the Mineral Resource are not entirely independent. Conventional estimation methods are based on the assumption of independence. For the 2020 estimate of Mineral Resources, AMC decided to use a mathematical transformation to generate a set of independent variables that could be estimated into a block model and then back-transformed to grade estimates. To prepare the data it was necessary to:

- Impute (replace) missing values for silicon, iron and phosphorus.
- Apply projection pursuit multivariate transform (PPMT) to manganese, copper, nickel, cobalt, silicon, iron and phosphorus values.
- Apply normal scores transform to abundance values.

These preparation steps are discussed below. The backscatter, slope, aspect (slope dip direction) and geological domain features were extracted from the GIS raster data at the nodule sample locations. This data was combined with the nodule sample data for analysis.

Figure 11.6 Plan showing location of data points and the NORI Area D boundary.



11.2.7 Declustering

The historic data exhibits two forms of spatial clustering Figure 11.6. Along the northern boundary of NORI Area D there are locations with multiple historic samples (up to 5 samples) collected within a tight square ‘X’ configuration (separation distances of ~1800 m to ~3600 m). While in the south of NORI Area D, the historic sample locations are arranged in strings of multiple samples in linear configurations. These are likely to be free-fall grab samples. Both forms of clustered data may introduce bias during grade estimation with methods that use spatially weighted averages, such as kriging.

A cell declustering algorithm was used to decluster the sample data. The spatially weighted (declustered) means and unweighted means for nodule abundance, nickel, copper and cobalt are compared in Table 11.7. The original and declustered means are very similar due to the low variance and high spatial continuity of the abundance and assay data.

Table 11.7 Spatially weighted mean assays for NORI Area D samples

	Mean	Weighted Mean
Abundance (kg/m^2)	17.42	16.7
Nickel (%)	1.37	1.37
Copper (%)	1.15	1.15
Cobalt (%)	0.136	0.135
Manganese (%)	31.07	31.01
Silicon (%)	5.62	5.62
Iron (%)	6.73	6.67
Phosphorus (%)	0.16	0.16
$MnO:SiO_2$ (%)	3.4	3.36

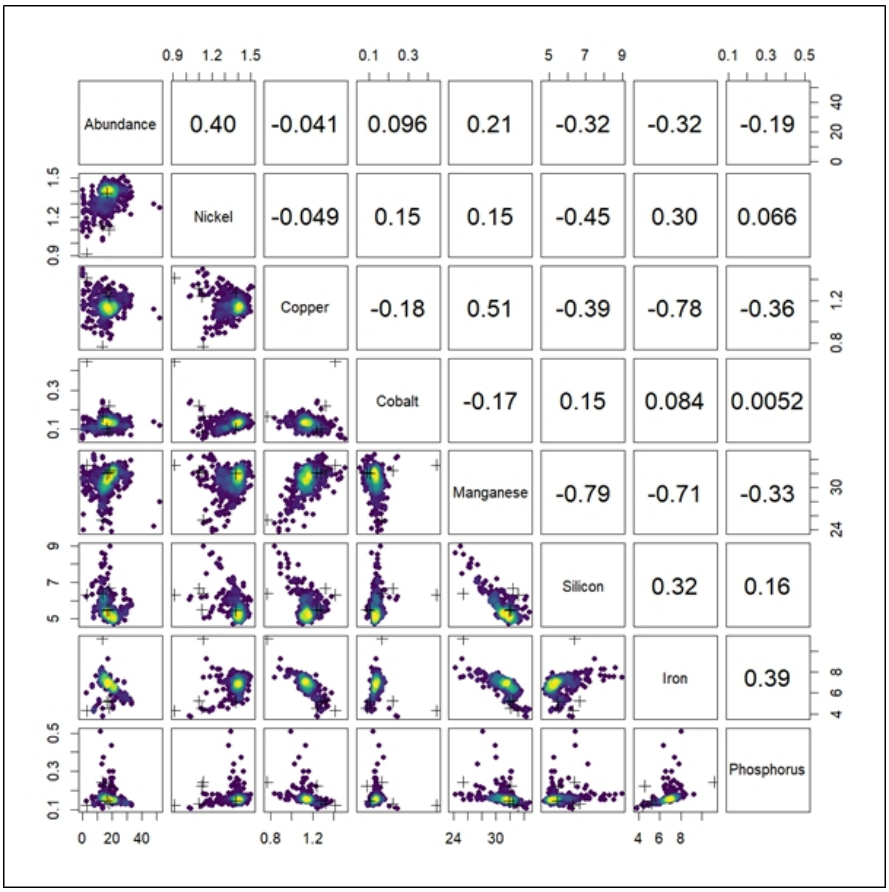
11.2.8 Outliers within the sample data

Outliers (extreme values) detected using the Local Outlier Factor algorithm are highlighted (black crosses) in the pairs plot shown in Figure 11.7 and listed in Table 11.7. All identified outliers are historic nodule samples. The location of these outliers relative to all samples within NORI Area D is shown in Figure 11.8. The identified outliers appear to be low in manganese and/or high in abundance.

The plot also reveals that nickel is moderately positively correlated with abundance and cobalt, while manganese is moderately positively correlated with copper and moderately negatively correlated with cobalt. Abundance also shows a weak correlation with copper and cobalt. Copper shows a weak correlation with nickel. Silicon shows a strong negative correlation with manganese.

The sample with anomalously high assay of 0.58% Co is the +50 mm fraction of NORI box core 227. The assay was confirmed by reanalysis of the sample pulp. The mass weighted cobalt assay for sample BC 227 is 0.29%.

Figure 11.7 Pairs plot showing correlations between NORI Area D sample values

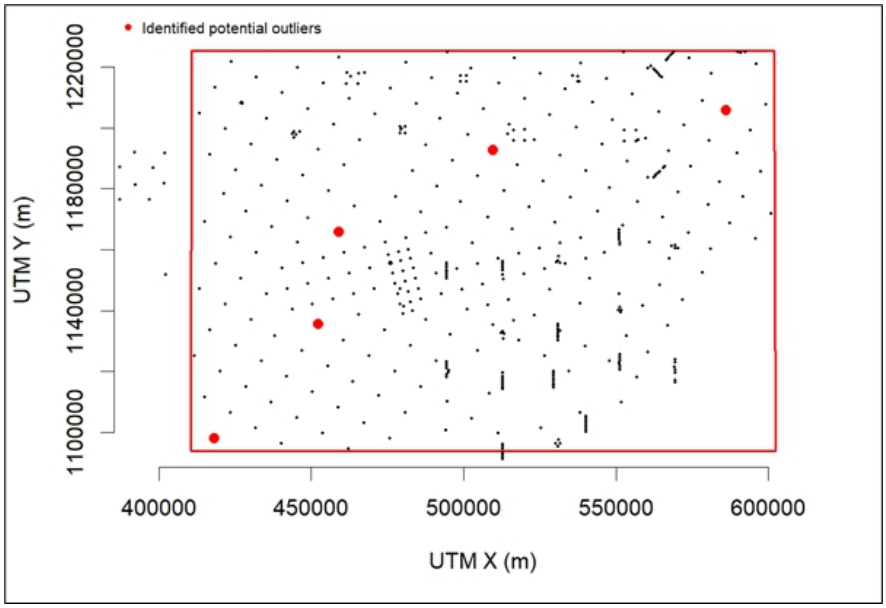


Note: Axes labelled in percentage. Potential outliers are shown as a red cross. The upper panels show the Pearson correlation coefficient. Averaged co-located data point values.

Table 11.8 Detected polymetallic nodule sample outliers

UTM X (m)	UTM Y (m)	Abundance (kg/m^2)	Nickel (%)	Copper (%)	Cobalt (%)	Manganese (%)	Silicon (%)	Iron (%)	Phosphorus (%)
586058.9	1205748	3.1	0.9	1.4	0.4	33.2	6.3	4.3	0.1
459028.4	1165737	16.5	1.4	1.3	0.1	32.0	5.5	5.2	0.1
418331.1	1098177	18.1	1.1	1.2	0.1	32.2	5.5	4.6	0.2
452376.0	1135656	13.6	1.1	0.8	0.2	25.4	6.4	11.2	0.2
509744.2	1192623	18.4	1.1	1.3	0.2	32.4	6.7	5.2	0.1

Figure 11.8 Location of identified outliers



11.2.9 Top-cuts

To reduce the influence of outliers on the estimation of local grades the most common approach is to trim those outliers to some arbitrary value (typically the 97.5, 98 or 99 percentile or mean plus twice standard deviation). Table 11.9 shows the top-cuts that could be considered using these methods. Other methods include selecting the top-cut value by inspecting log-probability plots and looking for where the distribution breaks down in the high values or looking at the inflection point in a mean-variance plot.

Table 11.9 Potential top-cut values for abundance, nickel, copper, manganese and cobalt values

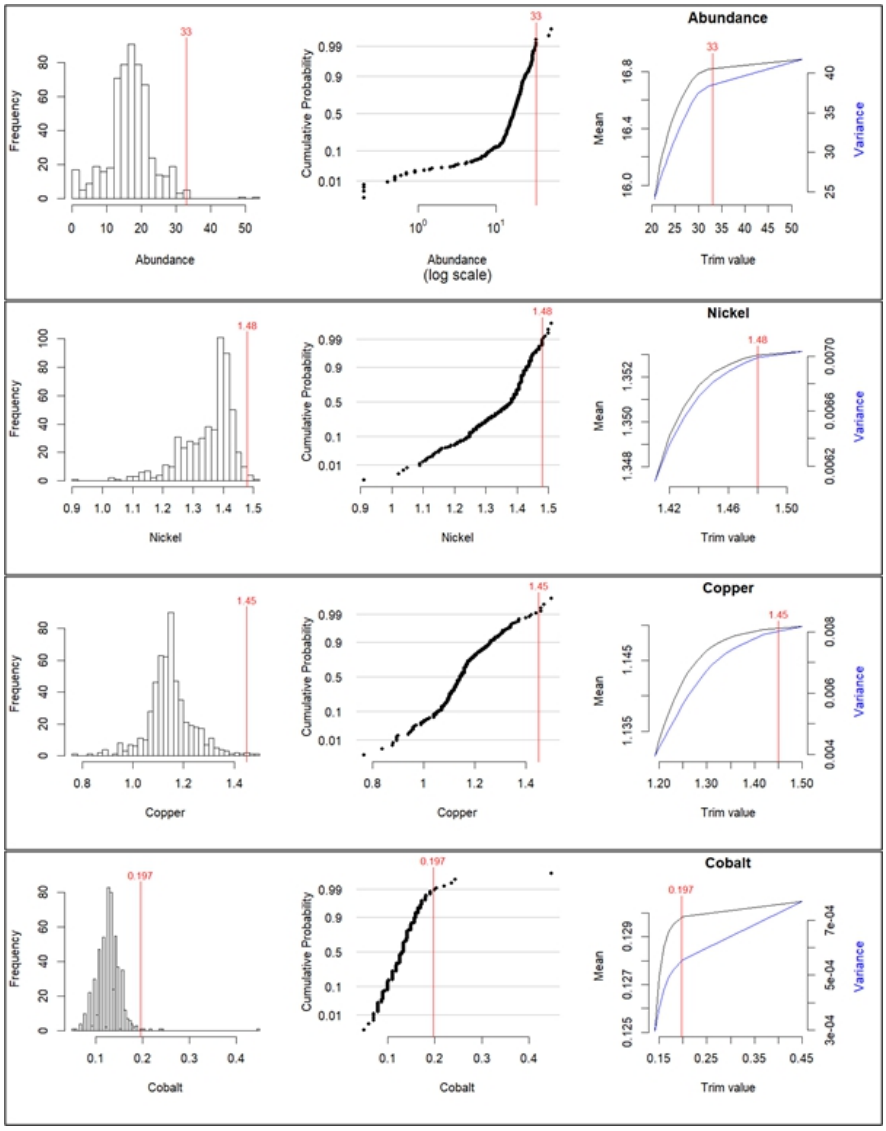
	97.5%	98.0%	99.0%	Mean+2*sd	Median+1.5*IQR
Abundance (wet kg/m^2)	29.80	29.90	30.54	28.44	26.32
Nickel (%)	1.48	1.48	1.49	1.53	1.46
Copper (%)	1.32	1.33	1.34	1.31	1.26
Cobalt (%)	0.17	0.17	0.21	0.19	0.16
Manganese (%)	33.59	33.73	34.31	34.38	34.20
Silicon (%)	7.54	7.85	8.16	6.98	6.53
Iron (%)	7.99	8.03	8.27	8.41	8.05
Phosphorus (%)	0.25	0.26	0.32	0.24	0.18

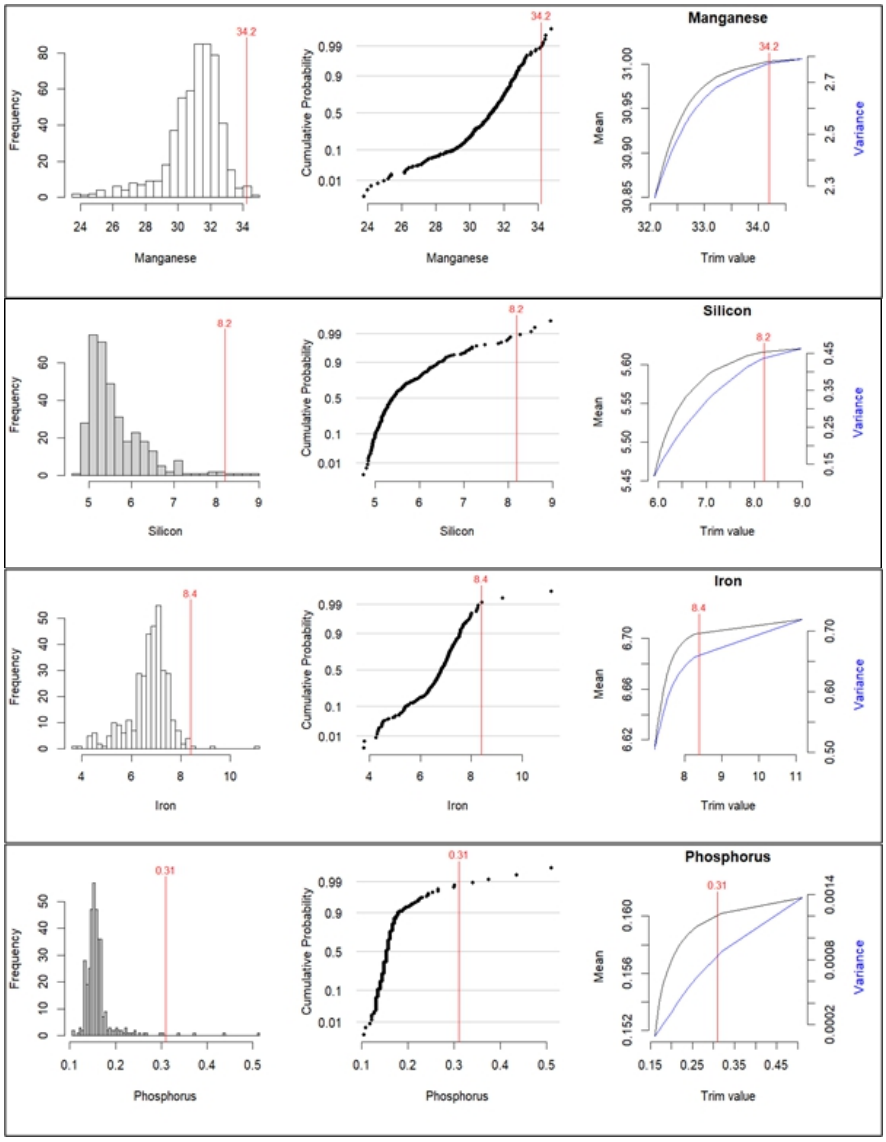
The top-cuts applied to the nodule sample data are listed in Table 11.10 and are shown as red lines in the plots provided in Figure 11.9. The mean-variance curves by top-cut value Figure 11.9 show that the top-cut values were selected where the tails of the distributions become unstable.

Table 11.10 Top-cut values applied to abundance, nickel, copper, manganese and cobalt values

Variable	Top-cut
Abundance	33
Nickel (Ni)	1.48
Copper (Cu)	1.45
Cobalt (Co)	0.197
Manganese (Mn)	34.2
Silicon (Si)	8.2
Iron (Fe)	8.4
Phosphorus (P)	0.31

Figure 11.9 Histogram, cumulative probability and mean-variance plots of abundance and grades for NORI Area D nodule samples



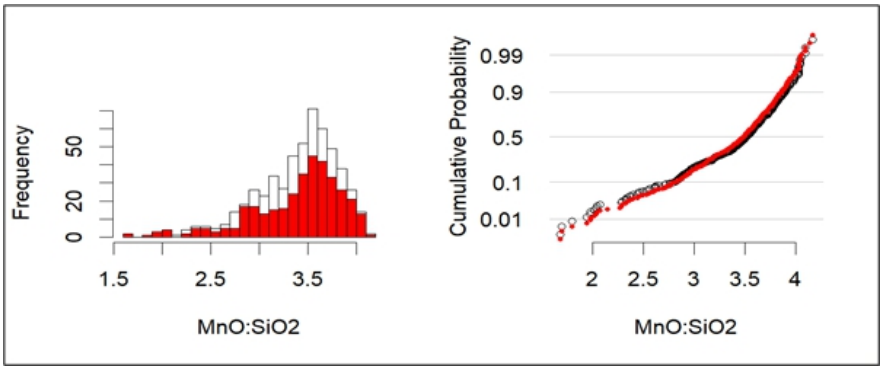


11.2.10 Missing value imputation

Silicon, iron and phosphorus assays are only present in the NORI and TOML data. The historic data only contains assays for manganese, nickel, copper and cobalt. To be able to apply a multivariate transform to the data, it is necessary that there are no missing values. Where there are missing values either the sample must be removed from the transform or the missing values must be imputed.

Linear regression models were developed to predict silicon (R^2 = 0.758), iron (R^2 = 0.788), and phosphorus (R^2 = 0.758), using the manganese, nickel, copper, and cobalt data. Histograms and cumulative probability plots of the silica to manganese oxide ratio
Figure 11.10 show that imputing the missing silicon values did not alter the distribution of the silica to manganese oxide ratio significantly.

Figure 11.10 Histogram and cumulative probability plots of $MnO:SiO_2$ ratio for NORI Area D nodule samples

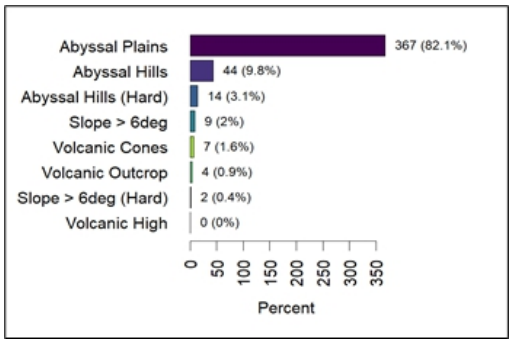


Note: Black data series is the original NORI Area D data. Red data series is NORI Area D data with missing silicon values imputed using linear regression.

11.2.11 Domain modelling

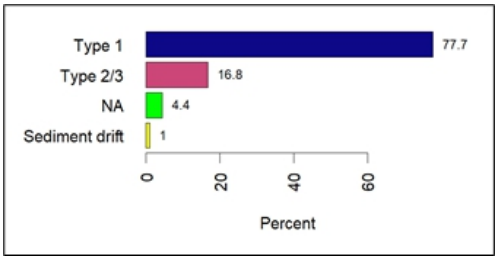
Geological domains were assigned to the NORI Area D samples by extracting the values from the geological domain raster at the sample UTM locations. The TOML Area F samples were all assigned to abyssal plains domain. The majority of the samples (367 samples, 82.1%) fall within the abyssal hills/plains domains. The proportions of nodule samples by geological domain are shown graphically in Figure 11.11.

Figure 11.11 Frequency of NORI Area D nodule samples by geological domains



Nodule type domains were assigned to the NORI Area D samples by extracting the values from the nodule type domain raster at the sample UTM locations. The TOML Area F samples were all assigned to Type 1 domain. The majority of the samples (379 samples, 84.8%), fall within the abyssal hills/plains domains. Due to the small size of the sediment drift domain, there is only one sample that falls within this domain. This is insufficient to describe the grade and nodule distributions for this domain. The proportions of nodule samples by nodule domain are shown graphically in Figure 11.12.

Figure 11.12 Frequency of NORI Area D nodule samples by nodule type domains



Boxplots of abundance and grades by domain Figure 11.13 suggest that as the slope increases the silicon content in the nodules increases, iron slightly increases and the manganese decreases. Also, the nickel and copper grades appear to decrease with increasing slope. This suggests that the nodules forming on the hills may be influenced by hydrothermal fluids from fissures/fractures associated with the hills or by the chemistry of the footwall rocks and sediment.

The high-slope (>6°) domains have very different distributions for all assays compared with the abyssal hills/plains domains which comprise bulk of the NORI Area D area. Because of this difference it is necessary to exclude the samples from the high-slope domains when estimating grades for the abyssal hills/plains domains. Also, because of the low number of samples in the high-slope domains and the volcanic domains it will be necessary to assign average grades to the resource model for these domains.

The boxplots of abundance and grades by nodule type Figure 11.14 suggest that the three samples within the sediment drift domain are significantly different from the Type 1 and 2/3 nodules. This domain contains an outlier cobalt value. Nodules within the sediment drift domain are low in nickel, high in copper, high in manganese and silicon and low in iron and phosphorus, compared with the other nodule domains. Comparison of Type 1 and Type 2/3 nodule grades indicates small differences. Type 1 nodules show higher nickel, iron, phosphorus and lower copper and silicon than the Type 2/3 nodules. These differences are also reflected in the nodule sizing analysis.

Due to the anomalous grade and abundance values for the sediment drift domain, these samples were excluded from the resource estimate. The low nodule abundance samples within the abyssal hills/plains domains, classified as either Type 1 or Type 2/3 nodules, may actually be occurring within unidentified sediment drift areas or on volcanic outcrops.

Figure 11.13 Boxplots of NORI Area D nodule abundance and assays by geological domain

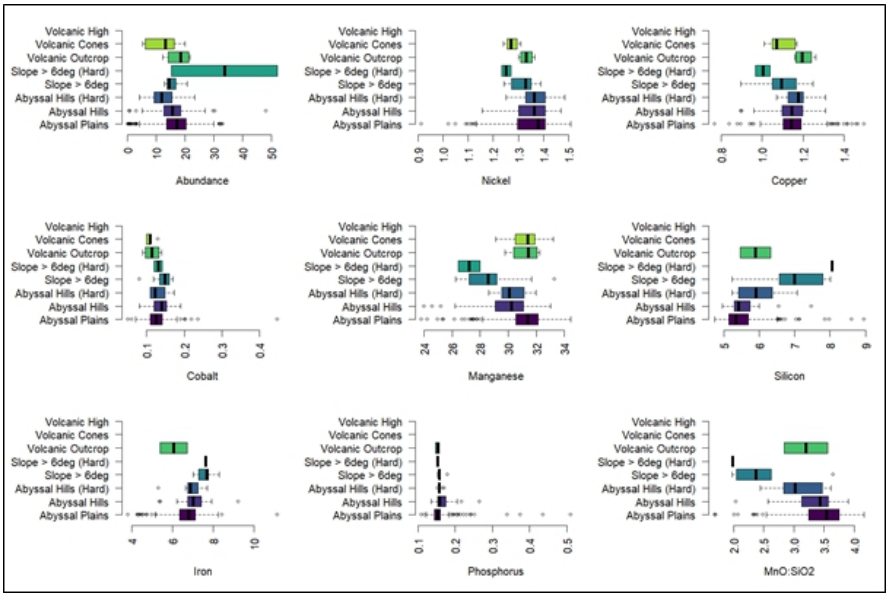
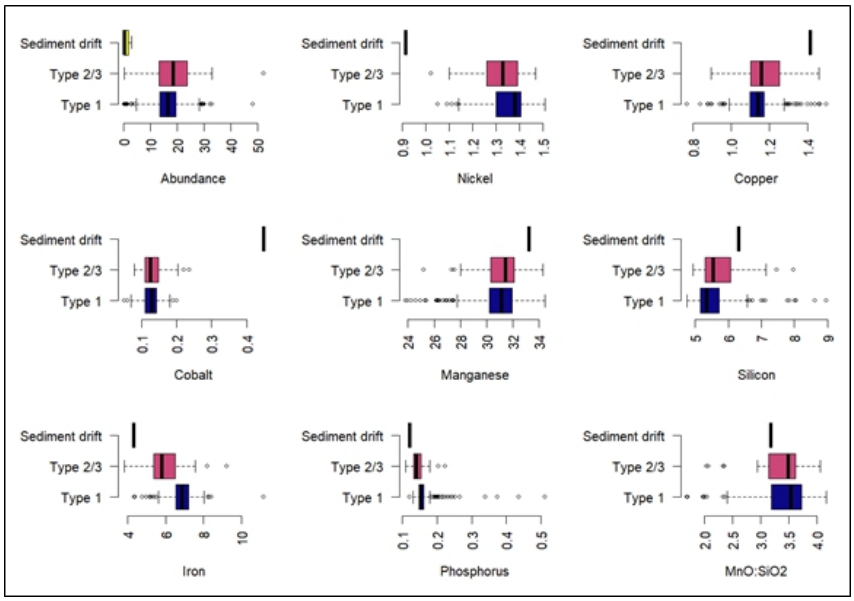


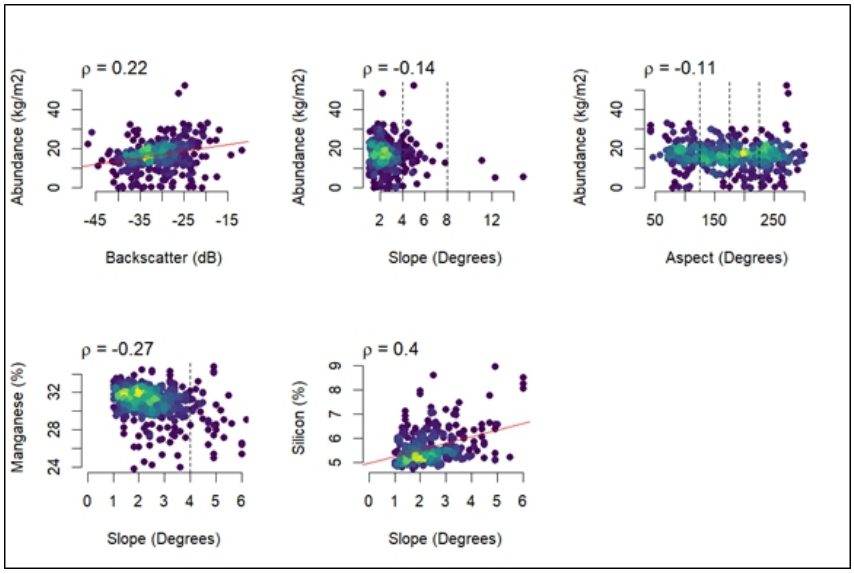
Figure 11.14 Boxplots of NORI Area D nodule abundance and assays by nodule type domain



Comparison of nodule abundance with backscatter, slope and aspect was undertaken to assess the influence of these features on the distribution of nodules and nodule abundance. Scatter plots of nodule abundance versus backscatter, slope and aspect are provided in Figure 11.15. Also shown are scatter plots of manganese and silicon versus slope.

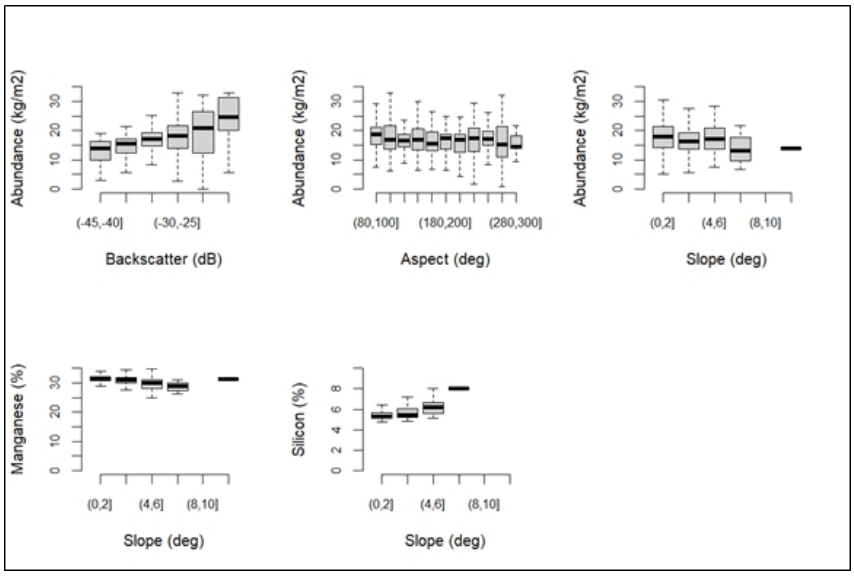
The plots suggest that there is linear relationship between backscatter and abundance which has a Pearson correlation coefficient of 0.35. Abundance does not appear to be influenced by slope or aspect. However, there are few samples in areas with a slope greater than 4°. Also note that there appears to be slightly lower abundance in areas where the aspect ranges from 125° to 175°. Silicon appears to increase with increasing slope (Pearson correlation coefficient of 0.38).

Figure 11.15 Scatter plots of NORI Area D nodule abundance versus backscatter, slope and aspect and manganese and silicon versus slope.



Boxplots Figure 11.16 were also generated to help visualize the trends seen in the scatter plots. The boxplot of abundance versus slope suggests that abundance is lower in areas with a slope greater than 6°. The trend in abundance versus backscatter is clear but also highlights a much higher variance in abundance in areas with higher backscatter.

Figure 11.16 Boxplots of NORI Area D nodule abundance versus backscatter, slope and aspect and manganese and silicon versus slope.



11.2.12 Data transformations

Missing values for silicon, iron and phosphorus were imputed using linear regression models. A Projection Pursuit Multivariate Transformation was then performed on the data. PPMT is a method to transform multivariate numeric data into multigaussian data. The transform aims to remove all bivariate correlations between the variables making them independent and to transform each variable to a normal distribution. The transform allows for independent random estimation or simulation of gaussian variables using simple kriging. The kriged estimates are then back-transformed into the original multivariate space, where all bivariate correlations and trends are restored. The transform is useful for simple kriging and sequential gaussian conditional simulations, where the variables are required to be independent and gaussian. The transform ensures that, even when using different variograms for each transformed variable, the bivariate relationships are maintained.

11.2.13 Summary statistics of processed sample data

Summary statistics for the data used for the NORI Area D resource estimate are provided in Table 11.11 to Table 11.15.

Table 11.11 Summary of samples within NORI Area D used for resource estimation

	Number	Missing	Min	Max	Mean	Median	Var	CV
Abundance (wet kg/m^2)	320	1	0.08	32.99	17.42	17.07	28.861	0.3080
Nickel (%)	320	18	0.91	1.51	1.37	1.40	0.006	0.0572
Copper (%)	320	18	0.77	1.41	1.15	1.14	0.007	0.0732
Cobalt (%)	320	18	0.07	0.45	0.14	0.13	0.001	0.2030
Manganese (%)	320	18	24.23	34.46	31.07	31.35	2.520	0.0511
Silicon (%)	320	72	4.74	8.97	5.62	5.41	0.466	0.1210
Iron (%)	320	72	3.80	11.16	6.73	6.82	0.703	0.1250
Phosphorus (%)	320	72	0.11	0.51	0.16	0.15	0.002	0.2430

Note the 14 missing values for nickel, copper, manganese and cobalt are the photo samples where only abundance is recorded and 4 box core samples with low abundances that were not assayed. The samples with missing silicon, iron and phosphorus are comprised of TOML samples, historic samples and NORI samples derived from photography.

Table 11.12 Summary statistics of historic (declustered) samples within NORI Area D and TOML Area F

	Number	Missing	Min	Max	Mean	Median	Var	CV
Abundance (wet kg/m^2)	29	0	6.73	28.10	14.88	14.01	25.396	0.3390
Nickel (%)	29	0	1.18	1.34	1.29	1.29	0.001	0.0280
Copper (%)	29	0	0.98	1.37	1.14	1.12	0.008	0.0804
Cobalt (%)	29	0	0.07	0.18	0.12	0.11	0.001	0.2420
Manganese (%)	29	0	25.88	32.90	30.55	30.86	2.175	0.0483
Silicon (%)	0	29						
Iron (%)	0	29						
Phosphorus (%)	0	29						

Note 28 samples are within NORI Area D and 1 sample is within TOML Area F.

Table 11.13 Summary of NORI 2018 nodule box-core and photo samples within NORI Area D used for resource estimation

	Number	Missing	Min	Max	Mean	Median	Var	CV
Abundance (wet kg/m^2)	59	1	6.50	29.90	17.90	18.00	20.387	0.2520
Nickel (%)	59	14	1.18	1.44	1.38	1.40	0.004	0.0468
Copper (%)	59	14	0.96	1.33	1.15	1.15	0.005	0.0618
Cobalt (%)	59	14	0.09	0.15	0.13	0.13	0.000	0.0967
Manganese (%)	59	14	26.15	34.41	31.35	31.83	2.702	0.0524
Silicon (%)	59	14	4.96	8.28	5.66	5.45	0.444	0.1180
Iron (%)	59	14	4.36	8.14	6.71	6.96	0.695	0.1240
Phosphorus (%)	59	14	0.13	0.21	0.16	0.16	0.000	0.1220

Note the 14 missing values for nickel, copper, manganese and cobalt are the photo samples where only abundance is recorded.

Table 11.14 Summary statistics of NORI 2019 nodule box-core samples within NORI Area D used for resource estimation

	Number	Missing	Min	Max	Range	Mean	Median	Var	CV
Abundance (wet kg/m^2)	207	0	0.08	32.99	32.92	17.55	17.13	28.98	0.3070
Nickel (%)	207	4	0.91	1.49	0.57	1.38	1.40	0.006	0.0558
Copper (%)	207	4	0.77	1.41	0.65	1.15	1.14	0.007	0.0721
Cobalt (%)	207	4	0.09	0.45	0.36	0.14	0.13	0.001	0.2130
Manganese (%)	207	4	24.23	34.46	10.24	30.95	31.19	2.543	0.0515
Silicon (%)	207	4	4.74	8.97	4.23	5.61	5.39	0.472	0.1220
Iron (%)	207	4	3.81	11.16	7.35	6.73	6.81	0.704	0.1250
Phosphorus (%)	207	4	0.11	0.51	0.40	0.16	0.15	0.002	0.2640

Table 11.15 Summary statistics of TOML Area F nodule box-core samples adjacent to NORI Area D used for resource estimation

	Number	Missing	Min	Max	Mean	Median	Var	CV
Abundance (wet kg/m^2)	25	0	1.19	29.13	18.14	18.30	46.448	0.3760
Nickel (%)	25	0	1.05	1.51	1.41	1.42	0.008	0.0621
Copper (%)	25	0	1.10	1.35	1.23	1.23	0.005	0.0584
Cobalt (%)	25	0	0.09	0.17	0.13	0.13	0.000	0.1400
Manganese (%)	25	0	30.11	33.62	32.17	32.30	0.845	0.0286
Silicon (%)	0	25						
Iron (%)	0	25						
Phosphorus (%)	0	25						

Note: these are the 25 samples collected by Nautilus Minerals Inc.

11.2.13.1 Spatial continuity

Spatial continuity of abundance and the grades of manganese, nickel, copper, cobalt, silicon, iron and phosphorus were assessed using semi-variograms. For convenience, semi-variogram is abbreviated to variogram in the following discussion.

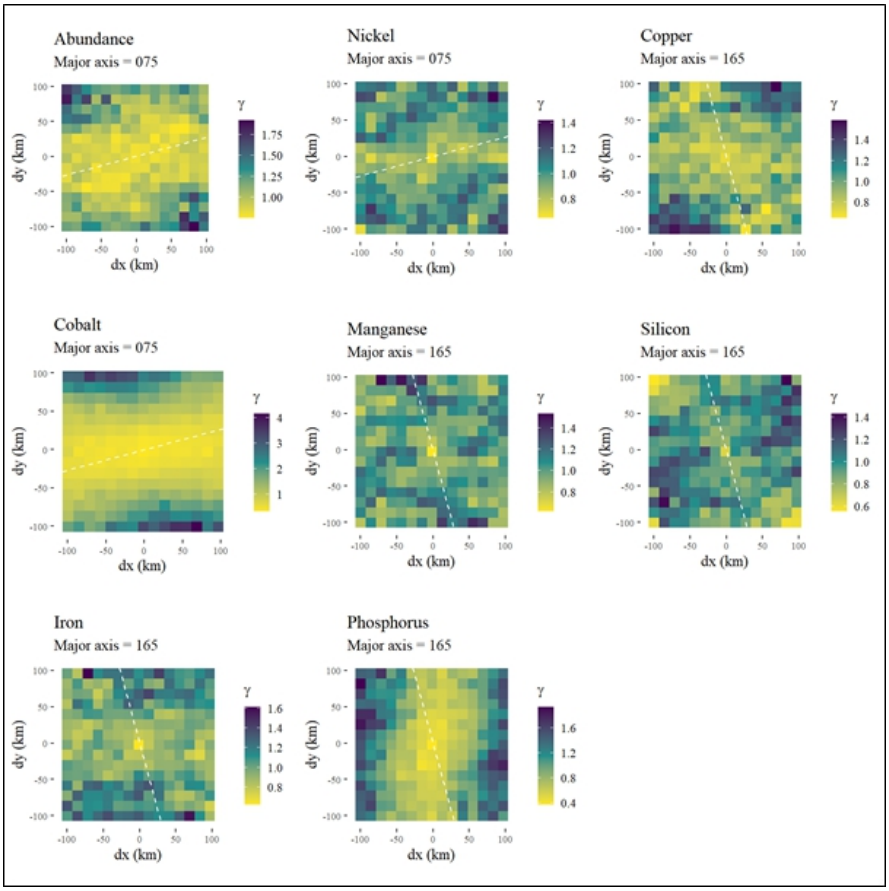
A variogram is a graphical representation of the variance between pairs of points at different separation distances. For data that is spatially correlated, it is expected that closely-spaced pairs of data will have lower variance than widely-spaced pairs. At a particular distance, known as the range, the pairs become uncorrelated and the variance no longer increases. Experimental variograms are generated from the data in different orientations to see if there is greater continuity in a particular direction (anisotropy). If there is no strong evidence of anisotropy, the directional variograms can be combined into an omnidirectional variogram for ease of interpretation. The experimental variogram can be fitted with a mathematical model (the variogram model) from which spatial weights can be determined during the kriging estimation process.

11.2.13.2 Polymetallic nodule abundance and nodule grades

All NORI box-core samples and nodule abundances derived from photos within NORI Area D were used for analysis of spatial continuity. The PPMT transformed data was used for calculating the experimental variograms.

The direction of greatest continuity suggested by the variogram maps Figure 11.17 is approximately 075° or 165°. This direction is an artefact of the sparseness of the sampling and the orientation of the sampling grid which is oriented 075°, roughly parallel to the broad regional trend of the CCZ.

Figure 11.17 Variogram maps of NORI Area D nodule sample assays



Two-structure, spherical models were fitted to the experimental variograms for abundance, nickel, copper, and manganese, while cobalt was fitted with only one structure.

The experimental variograms for cobalt suggest very long ranges in the 075° direction.

The variogram models used for estimating block nodule abundance and grades are listed in Table 11.16 and illustrated in Figure 11.18 to Figure 11.25.

Table 11.16 Variogram models

	Abundance	Nickel	Copper	Cobalt	Manganese	Silicon	Iron	Phosphorus
Nugget	0.1	0.1	0.10	0.10	0.10	0.10	0.10	0.10
Sill 1	0.6	0.7	0.60	0.20	0.35	0.50	0.60	0.30
Range 1 Omni	3.0	12.0	2.00	20.00	6.00	6.00	6.00	12.00
Range 1 Major	3.0	20.0	12.00	20.00	10.00	16.00	9.00	18.00
Range 1 Minor	3.0	12.0	9.00	7.00	4.00	6.00	6.00	12.00
Sill 2	0.3	0.2	0.30	0.70	0.55	0.40	0.30	0.60
Range 2 Omni	80.0	100.0	80.00	80.00	40.00	50.00	50.00	100.00
Range 2 Major	60.0	100.0	80.00	170.00	50.00	80.00	60.00	140.00
Range 2 Minor	60.0	60.0	60.00	60.00	30.00	30.00	40.00	100.00
Major Dir.	75.0	75.0	165.00	75.00	165.00	165.00	165.00	165.00
Anisotropy	1.0	0.6	0.75	0.35	0.60	0.38	0.67	0.71

Figure 11.18 Abundance omni-directional, 065° and 165° directional variograms

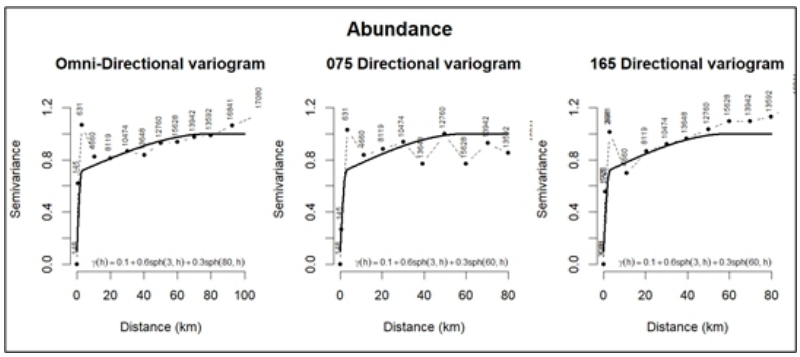


Figure 11.19 Nickel omni-directional, 065° and 165° directional variograms

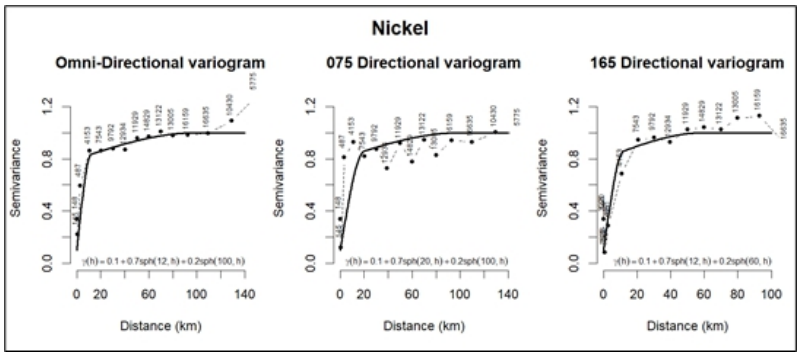


Figure 11.20 Copper omni-directional, 065° and 165° directional variograms

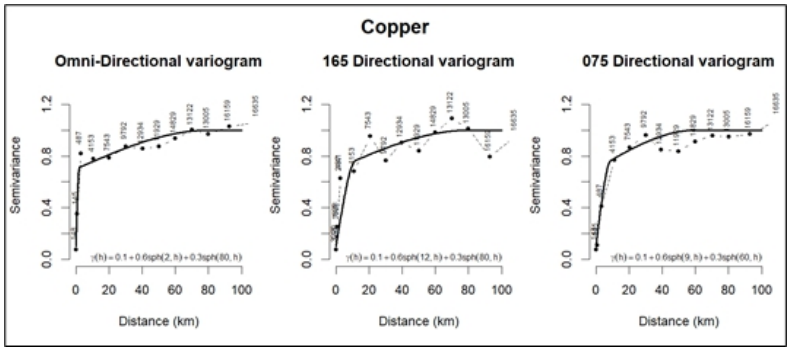


Figure 11.21 Cobalt omni-directional, 075° and 165° directional variograms

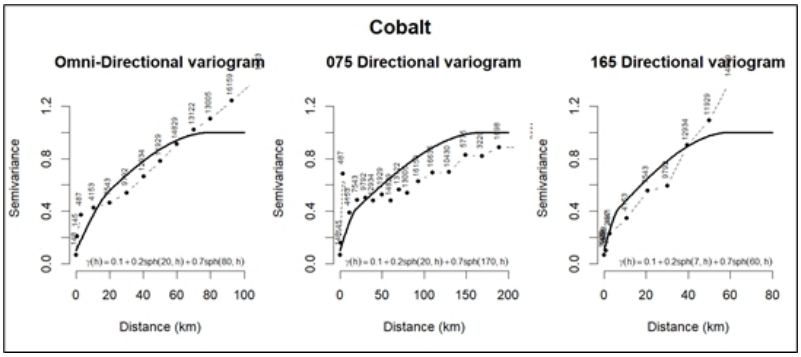


Figure 11.22 Manganese omni-directional, 075° and 165° directional variograms

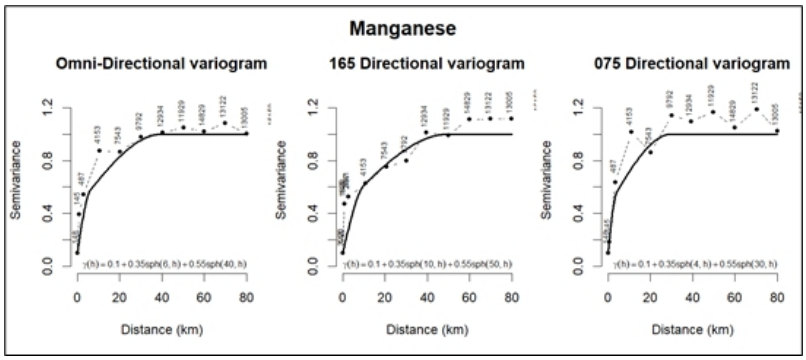


Figure 11.23 Silicon omni-directional, 075° and 165° directional variograms

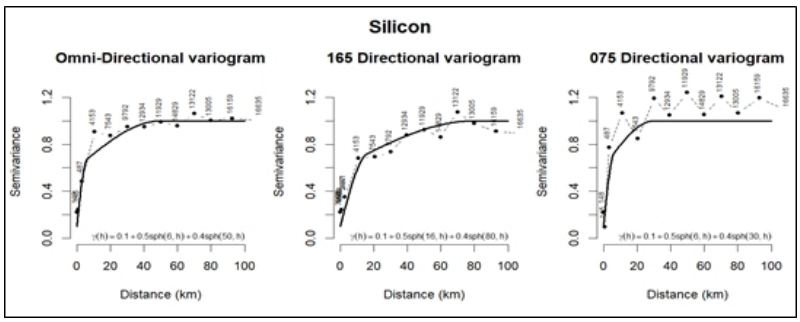


Figure 11.24 Iron omni-directional, 075° and 165° directional variograms

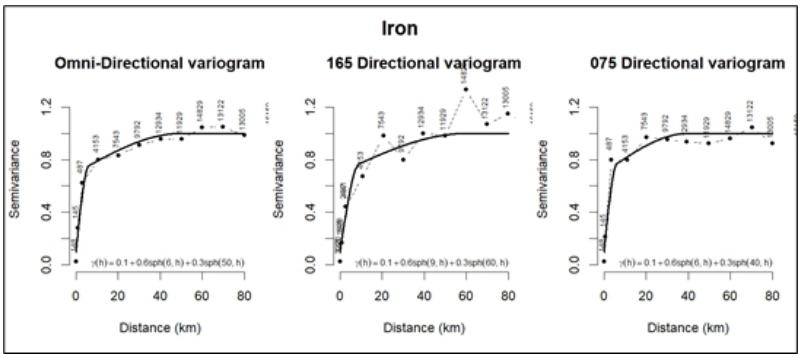
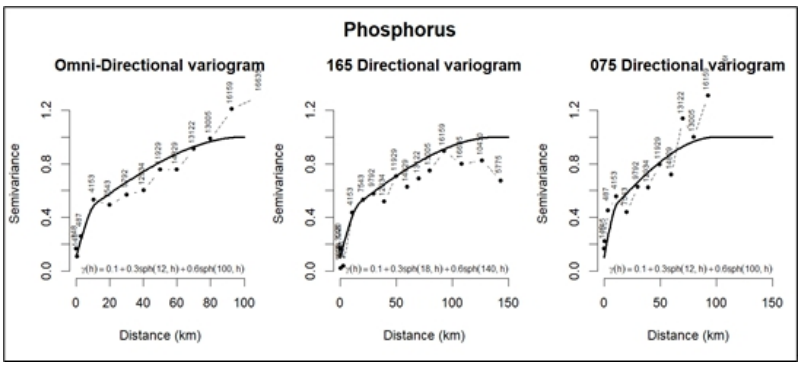


Figure 11.25 Phosphorus omni-directional, 075° and 165° directional variograms.

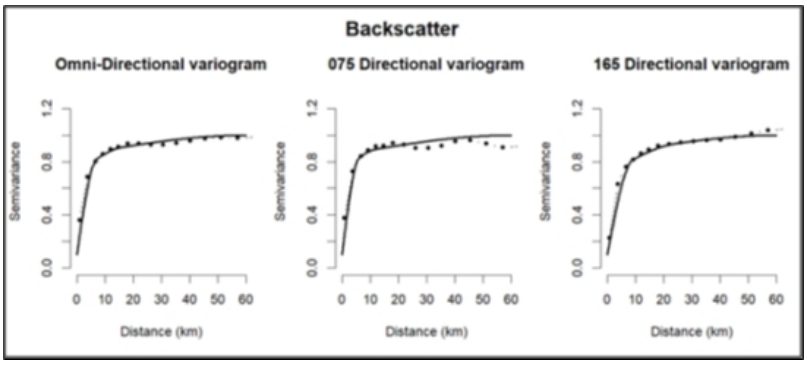


11.2.13.3 Backscatter

Acoustic backscatter is considered to reflect the substrate hardness of the seafloor. Absorption of the acoustic signal is expected to occur highest in areas covered by soft sediment (ooze) and lowest in areas of hard outcropping volcanics. The presence of nodules on the seafloor is expected to influence local absorption and be dependent on nodule packing which is a function of nodule abundance and nodule type.

Continuity of abundance is expected to be reflected in the backscatter data. Experimental variograms Figure 11.26 were calculated from the backscatter data and fitted with spherical variogram models. Omni-directional and directional variograms (065° and 155°) were calculated. The variograms are well-structured and consistent with the variograms of abundance.

Figure 11.26 Backscatter omni-directional, 065 and 155 directional variograms.



11.2.14 Estimation of nodule abundance and grades

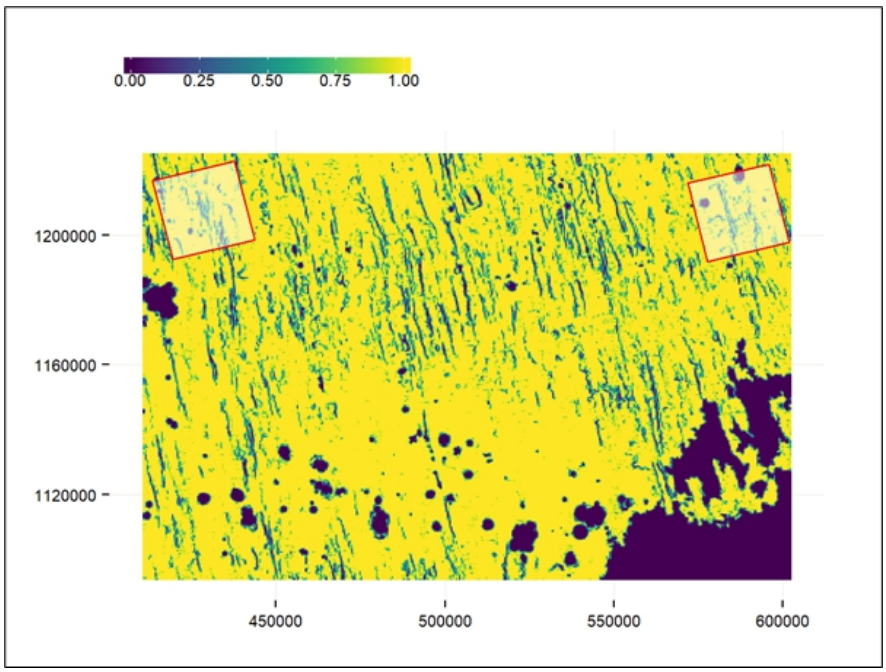
A geological raster grid model of NORI Area D was constructed from the geological domaining GIS raster data by aggregating the raster by a factor of 10. This expanded the raster cell size from 50 m to 500 m. The origin, extent and cell size are outlined in
Table 11.17.

Table 11.17 NORI Area D grid model extents

	Easting	**Northing**
Model origin	410444.2110	1093899.210
Model limit	602444.2110	1225399.210
Cell size	500	500
Number of cells	263	263

The geological grid model contains a layer (NOD) which identifies the percent coverage of nodules within the 500 m by 500 m panel. This layer was constructed by aggregating the 50 m by 50 m reclassified geological domain raster. The geological domain raster was reclassified by assigning a value of 1 for the abyssal plains, abyssal hills and abyssal hills (hard) domains. All other domains were assigned a value of 0. The 500 m by 500 m geological grid model is shown in Figure 11.27.

Figure 11.27 NORI Area D 500 m by 500 m grid model, showing percentage coverage of nodules



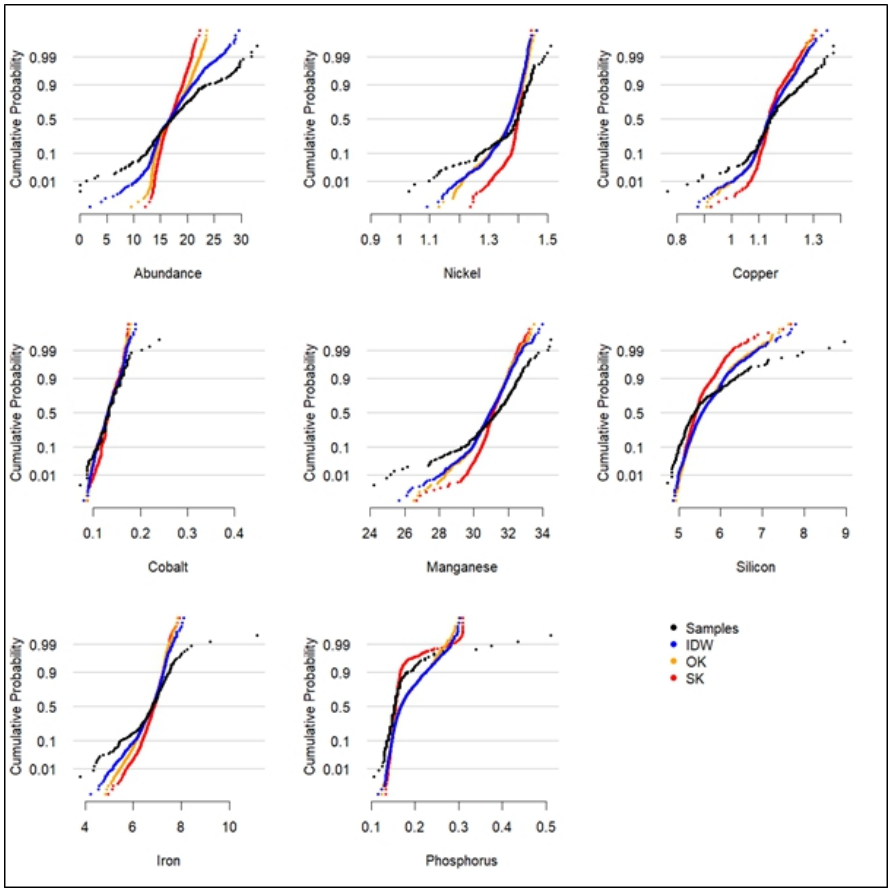
Points coloured by percent nodule coverage

The geological grid model was used as the discretization points for 3.5 km by 3.5 km sized panels. Inverse distance weighting (power of 2) and simple kriging were used to estimate nodule abundance and nodule grades into the geological grid model. Simple kriging was selected because ordinary kriging is not suited to the transformed grade variables. The 500 m by 500 m point estimates were aggregated to a grid with dimensions of 3.5 km by 3.5 km.

The prepared and transformed data was used for estimating nodule abundance and nodule grades. Samples falling within the high-slope (> 6°) geological domains were excluded from the estimation. A minimum of 1 and a maximum of 10 samples were used in informing the estimates.

Comparison of the inverse distance (IDW), ordinary kriging (OK) and simple kriging estimates with nodule sample data are illustrated in Figure 11.28. The cumulative probability plots show, as expected, that the simple kriging panel estimates are smoother (lower variance) than inverse distance panel estimates which are smoother than the nodule samples. The smoothing for the simple kriging estimates of nodule abundance is higher than the smoothing exhibited by the nodule grades. This is interpreted to be due to 70% of the sill in the spatial variogram for nodule abundance occurring at 3 km. The medians for the three distributions are very similar for nodule abundance and nodule grades.

Figure 11.28 Cumulative probability plots comparing nodule samples with IDW and SK estimates.



11.2.15 Cut-off grade

Due to the extremely low variance in the grades and the high metal content of the nodules, a cut-off based on abundance is appropriate for determining the limits of economic exploitation. A cut-off of 4 kg/m^2 abundance was chosen for the NORI Contract Area, based on the estimates of costs and revenues presented in this report. The method of calculation for the cut-off determines the minimum average nodule abundance needed during steady state operations such that the revenue minus costs (excluding capital) is greater than zero. Revenue includes metal pricing and metallurgical processing recoveries, and the costs include the collection, transport, processing, corporate costs, and royalties.

The metal prices assumed in the calculation of the cut-off were: nickel metal $16,472/t; nickel in nickel sulphate $18,807/t Ni; copper metal $6,872/t; cobalt metal $46,333/t; cobalt in cobalt sulphate $56,920/t Co; manganese in manganese silicate $4.50/dmtu. The price estimates are long term (2034 – 2046) forecasts provided in a report by CRU International Limited (CRU, 2020). The Qualified Person considers that this timeframe is reasonable in view of the likely time required to bring the majority of the NORI mineral resources into production.

11.2.16 Mineral Resource classification

The limiting factor for Mineral Resource classification for NORI Area D is confidence in the estimates for abundance. Confidence in the resource estimate was assessed using the probability of abundance being greater than ±15% of mean abundance over one quarter production (Measured) and one year's production (Indicated) at 90% confidence.

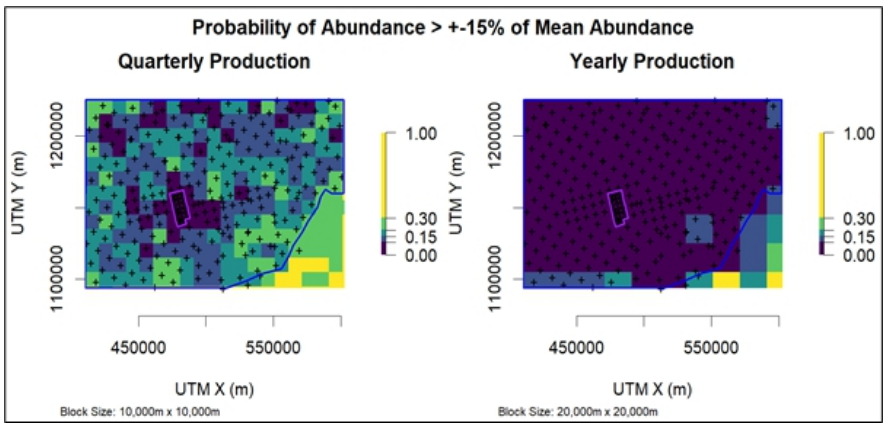
The risk in quarterly production estimates was assessed by using Conditional Gaussian simulation was used to simulate abundance. Each simulation was an equiprobable realization of the modelled data. The simulation was run 100 times using the same data and same estimation parameters and variogram model as used for kriging.

Assuming an annual production rate of 8 Mt (wet) of nodules per year (240 Mt over 30 years), the panel size for a quarter of a year's production is 10,846 m by 10,846 m assuming an average abundance of 17 kg/m^2. To simplify the conditional simulation, the area covered by a quarter of a year's production was set at 10 km by 10 km while one year's production was set at 20 km by 20 km. This equates to a yearly production rate of 6.4 Mt and one quarter of a year's production of 1.6 Mt with an average abundance of 16 kg/m^2.

The conditional simulations of 500 m by 500 m panels were aggregated up to 10 km by 10 km and 20 km by 20 km panels. The probability of abundance being greater than +/-15% of mean abundance over one quarter production (Measured) and one year's production (Indicated) is shown in Figure 11.29.

The conditional simulation of abundance Figure 11.29 suggests that in the small area near the centre of NORI Area D where sample spacing is 3.5 km by 3.5 km the estimates are of high confidence and could be classified as Measured Mineral Resource. In the rest of NORI Area D, where there are samples at a spacing of 7 km by 7 km and 10 km by 10 km, the estimates are of sufficient confidence to be classified as Indicated Mineral Resource. The south-east corner of NORI Area D where there are generally no samples, and which is mostly covered by the volcanic high domain is considered to be estimated with low confidence. Note that there are some areas covered by 10 km by 10 km spacing that have high confidence.

Figure 11.29 Abundance: Probability of exceeding 15% of mean at 90% confidence for quarterly and yearly production.



Perimeters: (purple) Area of high confidence = Measured Mineral Resource; (blue) Area of moderate confidence = Indicated Mineral Resource.

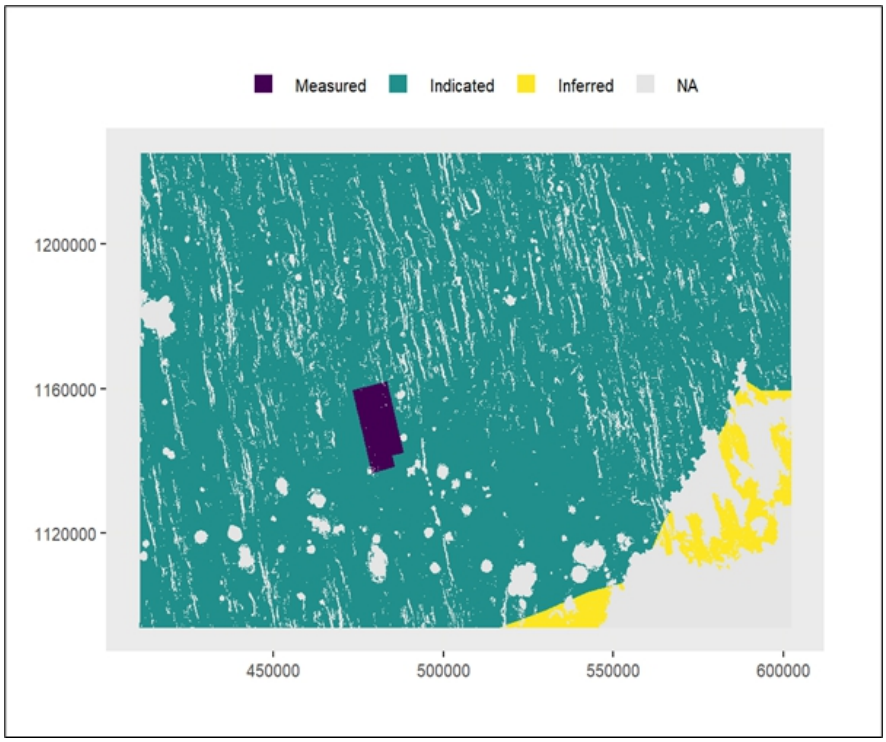
The Mineral Resource was classified on the basis of the quality and uncertainty of the sample data and sample spacing, in accordance with SEC Regulation S-K (subpart 1300).

The Measured Mineral Resource was assigned to the area within NORI Area D where box-core sampling was conducted on a nominal 7 km by 7 km spacing and infilled with estimates of nodule abundance from seafloor photography to a spacing of 3.5 km by
3.5 km.

The Indicated Mineral Resource was assigned to the area within NORI Area D where box-core sampling was conducted on a nominal spacing of 7 km by 7 km but without additional photo-estimates of nodule abundance, or 10 km by 10 km.

The Inferred Mineral Resource was assigned to the areas of abyssal plain in the southeast corner of NORI Area D that are largely unsampled. The volcanic high in the southeast corner was excluded from the mineral resource estimate due to the high level of uncertainty about nodule abundance and grades in this domain. Mineral Resource classification boundaries are shown in Figure 11.30.

Figure 11.30 Mineral Resource classification boundaries



The reasons for excluding the Volcanic High from the Mineral Resource include:

- Uncertainty in distinguishing between volcanic outcrop and high abundance nodules using the backscatter data.
- No nodule samples have yet been collected within the volcanic high and as such it is unknown whether there are any nodules occurring within the domain.
- The geological domain interpretation used for this resource update is based on significant supporting data compilation and re-interpretation of all existing license-scale data. In addition, it considers integration of associated basin-scale geological and geophysical data and interpretations. The previous resource estimation (2018) and data interpretation primarily focused on interpretation of AUV data over the small, closely-sampled area near the centre of NORI Area D.
- The volcanic high is interpreted as a relic volcanic intersection high, which also includes a relic transform parallel trough. Both are volcanic related features related to the Clipperton transform zone. The volcanic high is interpreted to have formed when the Clipperton transform fault was active, at a time when the seafloor was situated at the East Pacific Rise mid-ocean ridge. This is supported by comparison of backscatter texture, outcropping structural fabric within this domain and the associated bathymetric geomorphology.

- The terrain across the volcanic high is extremely rugged and is at a much shallower depth than the rest of NORI Area D. The volcanic high is less than 50 km from a significant $CaCO_3$ anomaly seen in the compilation of basin-scale surficial sediment lithology data. This strongly suggests that the volcanic high sits above the carbonate compensation depth in a region that is therefore not favorable for nodule formation.

- The evidence that nodule chemistry is affected by substrate means that it is not reasonable to infer the grades of nodules that might occur in the Volcanic High domain from grades of nodules in other domains.

In the Qualified Person's opinion, the Mineral Resources have reasonable prospects of economic extraction. No fatal flaws have been identified. It is reasonable to expect that, with further engineering design and testwork, the technical and economic factors relevant to the collection of nodules and the extraction of nickel, cobalt, copper and manganese products from the nodules can be resolved. Accordingly, it is the Qualified Person's opinion that all issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

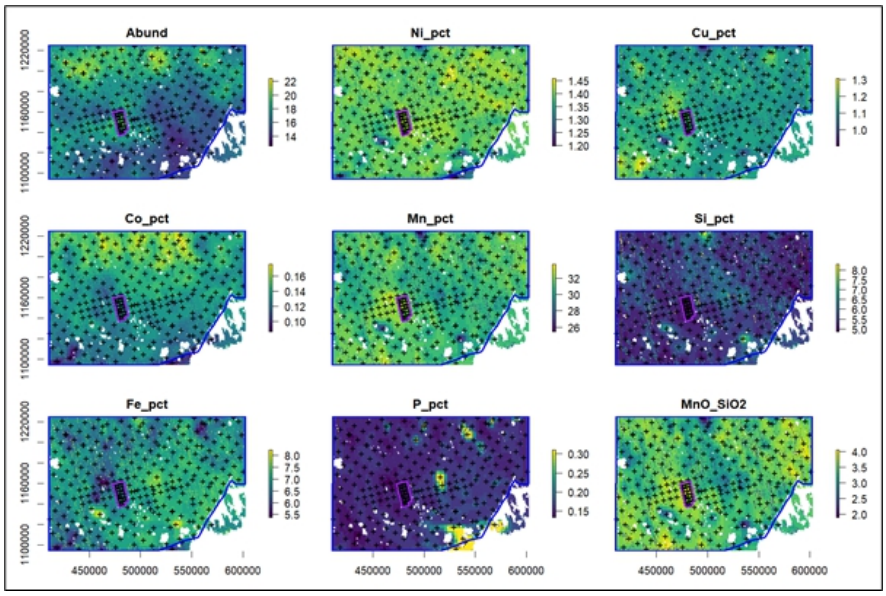
11.2.17 Estimation results

The 3.5 km by 3.5 km panel estimates were added back onto the 50 m by 50 m geological domaining GIS raster model. Nodule abundance and nodule grades for cells identified as either high-slope (> 6°) or volcanic outcrop domains were set to the mean values from the nodule samples. Cells identified as volcanic cone or volcanic high or sediment drift were set to null.

Resource categories were added to the 50 m by 50 m raster grid model using the perimeters defined by conditional simulation.

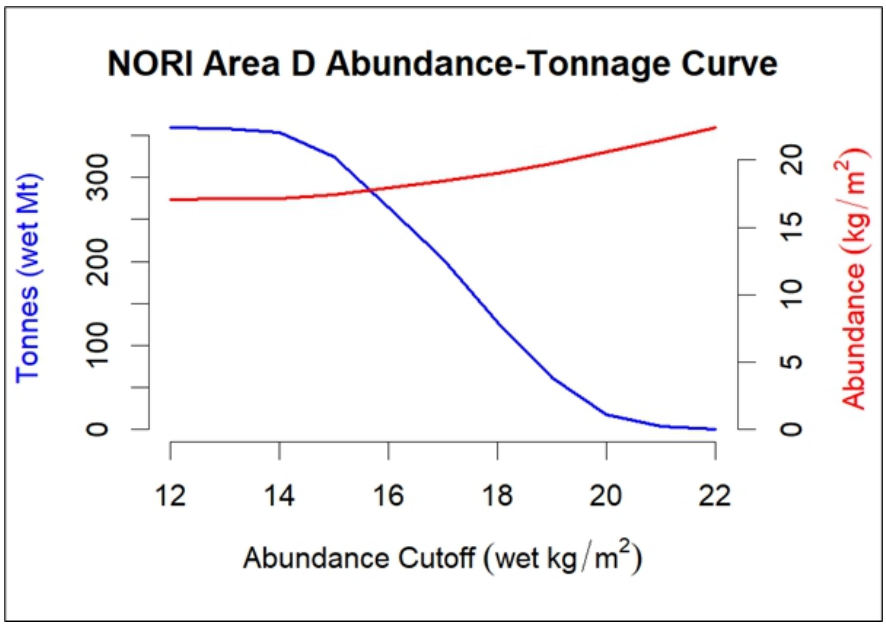
Results of the simple kriging (SK) estimates are shown in the spatial plots Figure 11.31. Note the two very small spots of high silicon estimated in the abyssal domains. These two spots are interpreted to be the result of miss-labelling of high slope domains which have high silicon. Also note the high phosphorus in the south-eastern near the volcanic high domain. Cobalt is relatively high in the north of NORI Area D and relatively low in the south while manganese, nickel, copper and iron are relatively uniformly distributed across NORI Area D. Abundance and cobalt grade appears to be higher in the north.

Figure 11.31 Nodule abundance and nodule grades 3.5 km by 3.5 km SK panel estimates for NORI Area D



The nodule abundance and tonnage curves for NORI Area D at various nodule abundance cut-offs are shown in Figure 11.32. The curves indicate that there are no 3.5 km by 3.5 km panels with abundance of less than 12 kg/m^2. The volcanic outcrop, volcanic high, volcanic cones and high-slope (>6°) domains were excluded from the estimate.

Figure 11.32 NORI Area D abundance-tonnage curve.



The Mineral Resource is reported in Table 11.18 at a nominal abundance cut-off value of 4kg/m^2.

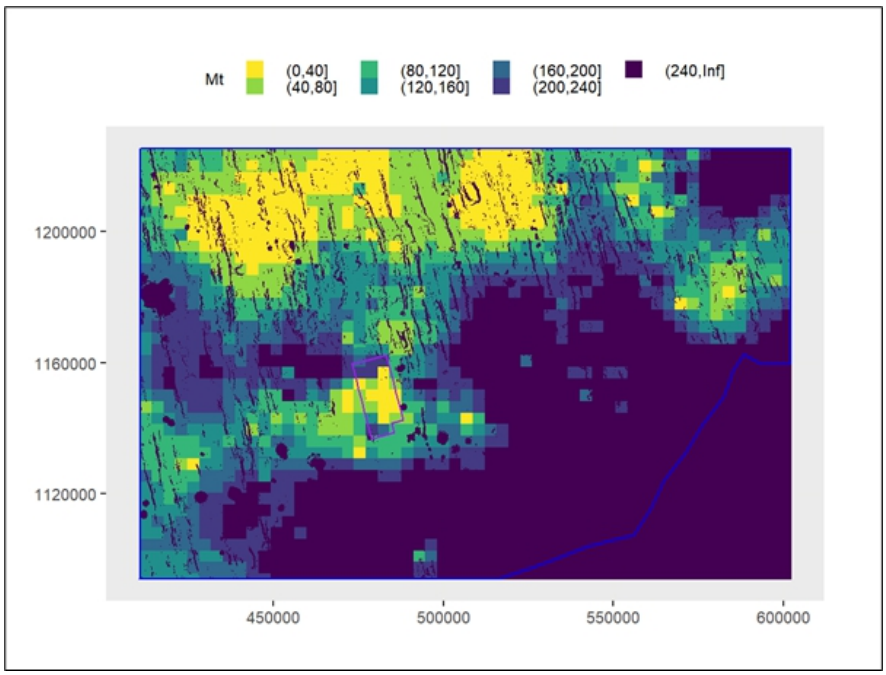
Table 11.18 2020 Mineral Resource estimate, in situ, for NORI Area D at 4 kg/m^2 abundance cut-off

NORI Area	Category	Tonnes (Mt (wet))	Abundance (wet kg/m^2)	Nickel (%)	Copper (%)	Cobalt (%)	Manganese (%)	Silicon (%)
D	Measured	4	18.6	1.42	1.16	0.13	32.2	5.13
D	Indicated	341	17.1	1.40	1.14	0.14	31.2	5.46
D	Measured + Indicated	345	17.1	1.40	1.14	0.14	31.2	5.46
D	Inferred	11	15.6	1.38	1.14	0.12	31.0	5.50

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

Figure 11.33 shows the panels coloured by abundance, with the colour intervals corresponding to seven sequential 40 Mt (wet) increments, ranked from highest abundance to lowest abundance. The figure shows that abundance is highest along the northern margin of NORI Area D, which is also high in cobalt.

Figure 11.33 2020 Mineral Resource model coloured by abundance, in seven 40 Mt (wet) increments



11.2.18 Comparison with previous resource estimates

The first resource estimate for NORI Area D, completed in 2012, was 399 Mt (wet) of polymetallic nodules and was based solely on historic samples.

In 2018 NORI completed a box core sampling campaign that focused on a small area near the centre of Area D which was selected as a potential trial mining site. Where box core sampling was conducted on a nominal 7 km by 7 km spacing and infilled with estimates of nodule abundance from seafloor photography on a 3.5 km by 3.5 km grid the Mineral Resource was classified as Measured. Where sampling was at a nominal spacing of 7 km by 7 km but did not have any additional photo-estimates of nodule abundance, the Mineral Resource was classified as Indicated. The additional samples resulted in an updated resource estimate of 383 Mt (wet), consisting of 4 Mt Measured and 34 Mt Indicated and 345 Mt Inferred Mineral Resources.

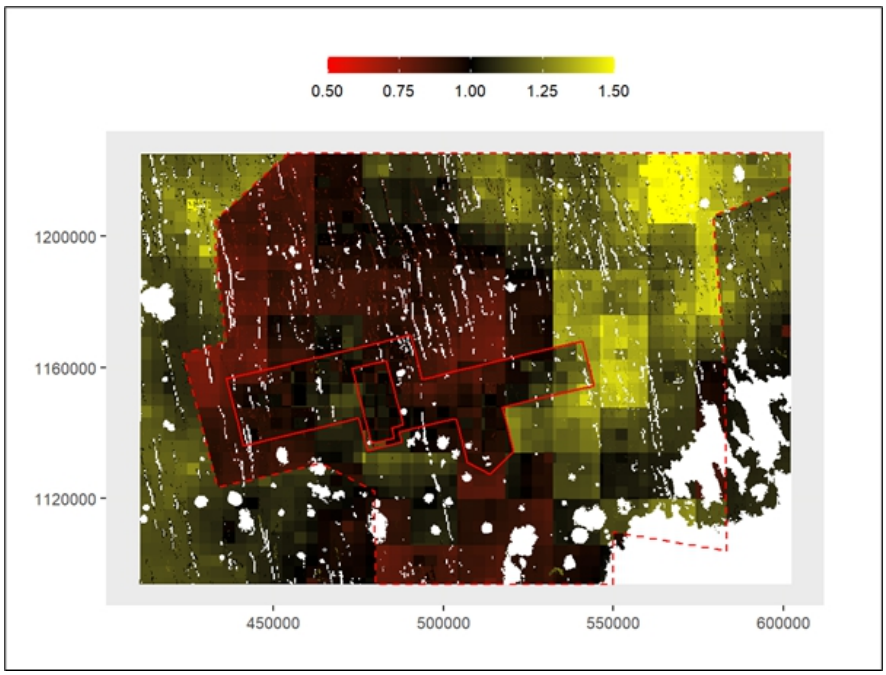
The latest exploration campaigns (2019) added box core sampling at a spacing of 10 km by 10 km across most of the remainder of NORI Area D. The latest Mineral Resource estimate (2020) is 356 Mt (wet), consisting of 4 Mt Measured and 341 Mt Indicated and 11 Mt Inferred Mineral Resources. Taking into account the conversion of the majority of Inferred to Indicated Mineral Resources, the remaining Inferred Mineral Resource has decreased by 26 Mt as a result of excluding the Volcanic High domain in the south-eastern corner of NORI Area D, due to uncertainty about the occurrence of nodules in this area.

The 2020 resource estimate is also slightly higher in abundance (5.4% higher), and nickel (6.1% higher), cobalt (5.4% higher) and manganese (2.2% higher) grades than the 2018 estimate.

Comparison of the area covered by Inferred, Indicated and Measured Mineral Resource for the 2020 estimate and the same area in the 2018 model shows that nickel grade has increased by 6% (1.32% to 1.40% Ni) while abundance has increased by 6%
(16.0 to 17.0 kg/m^2). Mineral Resource tonnage has increased by 10% (from 10 to 11 Mt) in the Inferred area and 7% (from 320 to 341 Mt) in the Indicated area. The positive conversion rates arising from infilling the sampling grid with high quality box core sample data (rather than extending the area sampled) are exceptionally high compared to the typical outcomes from infill sampling of terrestrial mineral deposits.

To allow direct comparison between the 2018 and 2020 resource estimates the 2018 block model was converted to polygons, one rectangular polygon for each block, and then rasterized to match the 2020 raster model. The two models were combined by dividing the 2020 estimate of abundance at each raster pixel location by the 2018 estimate of abundance to obtain a conversion rate from the 2018 estimate to the 2020 estimate. The abundance conversion rate from the 2018 model to the 2020 model is shown in
Figure 11.34. A value below 1.0 indicates a reduction in abundance and a value above 1.0 indicates an increase in abundance for the 2020 model over the 2018 model. Overall, the area previously identified as Measured and Indicated Mineral Resource has not changed other than some slight changes along the margins due to the addition of the 2019 Campaign 6A and 6B sampling. The biggest change is along the western margin where the area previously identified as Inferred_2 (not supported by sampling) has increased in abundance. Also, the abundance along the western margin of the Inferred_1 boundary (red dashed line on the plot) has decreased in abundance due to better constraint of higher abundance, historic sampling in the area. The biggest increase in abundance is in the north-eastern corner where it has increased by nearly a factor of 2.

Figure 11.34 Ratio 2020:2018 abundance estimates, showing the 2018 resource classification boundaries



Note: Measured Resource: inner red solid polygon, Indicated Resource: outer solid red polygon, Inferred_1 Resource: dashed red polygon, Inferred_2 Resource: remainder

11.3 NORI Area A, B and C

The Mineral Resource estimates for NORI Areas A, B and C have not been updated. The existing Mineral Resource estimate generated by Golder in 2012 remains the current estimate. There has been no new exploratory work conducted in the areas to warrant an update to the estimates.

All information for this section has been summarized from Golder 2015 technical report. The information presented for NORI Area D in this section, is superseded by the information presented in Section 11.2.

11.3.1 Boundaries and geological domains

Based on the geophysical interpretation of the NORI multibeam there are areas identified as low nodule density and possible lava flows and outcrops in NORI Area C. These areas cover a lower percentage of NORI Area C than the areas identified as high, medium, or indeterminate nodule density. The areas identified as low nodule density and possible lava flows and outcrops are numerous, discontinuous, and are generally smaller than the average sample spacing. As such, no domaining was done using the mapped areas of potential lava flow and outcrop. Since the NORI Area falls within a single bathymetric domain (abyssal hill province) and entirely within the CCZ deposit boundary, it was not considered necessary to domain the data for an Inferred Mineral Resource.

11.3.2 Nodule sample data

The polymetallic nodule data for NORI Areas A, B and C have not changed since the 2012 Mineral Resource estimate (Golder 2015). The nodule data used for the 2012 resource estimate included only the historic polymetallic nodule sample data. The summary statistics for this data is listed in Table 11.19. Note that this summary includes NORI Area D.

Table 11.19 Summary statistics of samples within the NORI Area used for the 2012 Mineral Resource estimate.

Variable	Samples	Missing	Min	Max	Mean	Var	CV	Median
Ni (%)	360	32	0.68	1.75	1.30	0.016	0.10	1.31
Co (%)	360	32	0.05	0.33	0.17	0.004	0.35	0.19
Cu (%)	360	32	0.40	1.50	1.10	0.028	0.15	1.13
Mn (%)	360	32	12.84	33.90	29.45	8.406	0.10	30.20
Abundance (wet kg/m^2)	392	0	0	52.2	11.9	64.303	0.67	12.00

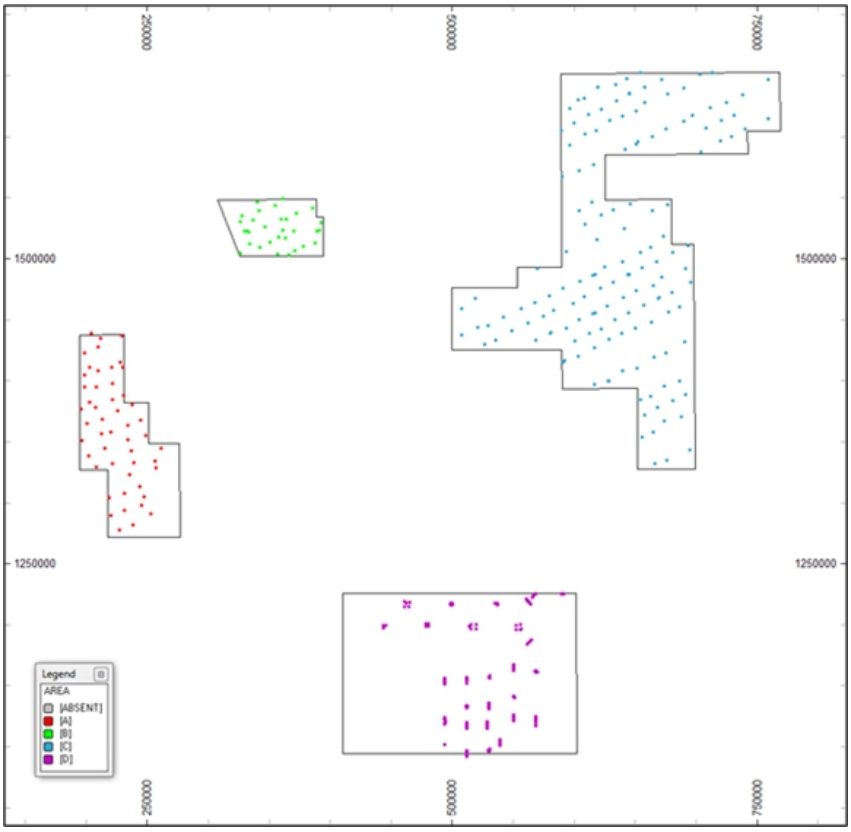
Source: Golder 2015. Var = variance; CV = coefficient of variation; Ni = nickel; Co = cobalt; Cu = copper; Mn = manganese

11.3.3 Data processing

The data were checked for anomalous or erroneous data and cross-checked with data supplied directly by the ISA. Data preparation steps included in order:

- Data validation.
- Conversion of latitude/longitude coordinates to UTM coordinates using WGS 84 datum:
  - These areas cover several UTM zones but were overlaid to facilitate modelling of all areas in one model.
  - The minimum and maximum UTM coordinates for each of the NORI areas are listed in Table 11.20.
- A plan of the tenement or Area locations is presented in Figure 11.35.
- Resetting 0 assay values to missing and 0 abundance values to 0.01 where there are assay values.
- Application of top cuts (see Table 11.22).

Figure 11.35 NORI Areas A, B, C and D, showing location of historic data



NB: Areas A, B, C and D cover several UTM zones but were overlaid to facilitate modelling of all areas in one model. The apparent distances between the Areas in this figure are not real distances.

Table 11.20 Minimum and maximum UTM coordinates for NORI Exploration Areas

NORI Area	Pioneer Investor		UTM Easting	UTM Northing	UTM Zone
A	Yuzmorgeologiya	Minimum	546318.6	1276704.2	8
		Maximum	612250.2	1438373.8	
B	Yuzmorgeologiya	Minimum	627009.7	1502544.4	8
		Maximum	693143.2	1548239.6	
c	IOM	Minimum	508307.5	1651913.6	10
		Maximum	759829.0	1331443.7	
D	BGR	Minimum	444252.3	1091225.8	11
		Maximum	592471.8	1224898.2	

Source: Golder 2015.Yuzmorgeologiya = State Enterprise Yuzhmorgeologiya (Russian Federation). IOM = Inter Ocean Metal Joint Organisation; AMR = Arbeitsgemeinschaft Meerestechnisch Rohstoffe.

11.3.4 Declustering

Declustering was used to remove potential biases in statistics that can arise from variable sample spacing, which can arise from the multiple sampling at close locations as the ship undertakes its voyage.

Normal cell declustering without any boundaries can present issues where the edge cells become overweighted as the cell size is increased. A modified cell declustering algorithm was used that weights the cells to the block model volume within each cell. The process provides a declustering weight which is used to weight the univariate statistics
Table 11.21. For this method, the cell size was optimized for a square window size of
30 km and the origin offset 10 times.

Table 11.21 NORI Areas A, B, C and D declustered statistics (historic data only).

Variable	Samples	Min	Max	Mean	Var	CV	Median
Ni (%)	360	0.68	1.75	1.29	0.021	0.11	1.32
Co (%)	360	0.05	0.33	0.19	0.003	0.27	0.20
Cu (%)	360	0.40	1.50	1.08	0.035	0.17	1.12
Mn (%)	360	12.84	33.90	28.91	10.524	0.11	29.81
Abundance (wet kg/m^2)	392	0	52.20	11.57	66.736	0.71	11.00

Source: Golder 2015 Var = variance; CV = coefficient of variation

11.3.5 Top-cuts

The coefficient of variation is very small for nodule abundance, nickel, copper, manganese, and cobalt, suggesting that the application of top-cuts is not necessary. However, due to the wide spacing of samples, a top-cut was applied to trim the high (99.5th percentile) values to reduce the likely impact of the high-grade outliers.

The presence of outliers (extreme values) and the need to apply “top-cut” values or “capping” (where samples above a certain threshold are assigned the top-cut value) to sample populations was assessed using a number of techniques:

- Examination of grade distributions using cumulative probability plots.
- Statistical assessment of the grade distributions.
- Examination of the spatial locations of identified outlier samples.

Top cuts defined in Table 11.22 are roughly equivalent to the 99.5th percentile of the mineralized samples and do not have a significant impact on the average grade. Application of top cuts reduced the mean only for manganese, which was reduced by a very low 0.2% of the uncut mean. This is simply because the grades within the CCZ are very consistent due to the deposit’s hydrogenetic and diagenetic origin.

Table 11.22 NORI Areas A, B, C and D top cuts used for NORI 2012 Mineral Resource estimate.

Variable	Top-Cut Value (%)
Ni	1.56
Co	0.31
Cu	1.46
Mn	33
Abundance	32

Source: Golder 2015

11.3.6 Spatial continuity

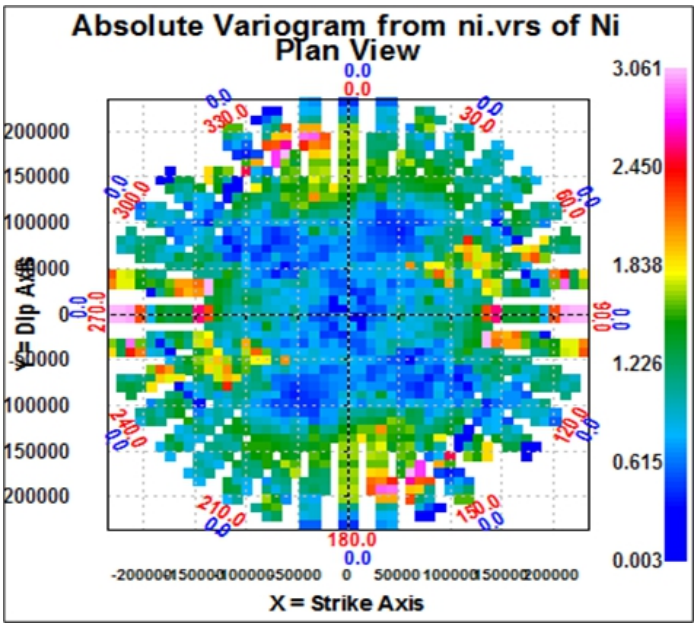
The variograms for NORI Areas A, B and C were not updated as there has been no new sampling collected from these areas since 2012. This Section is summarised from the Golder 2015 technical report.

The samples with top-cuts applied were used for variogram analysis. Traditional variograms showed good structure and were used for all variogram modelling. The variograms were scaled to the population variance. Variogram maps were calculated for the purpose of determining direction of greatest continuity. An example variogram (nickel) shown in Figure 11.36. Variogram models are presented in Table 11.23.

Table 11.23 Variogram models, NORI Area A, B and C

Variable	Nugget	Sill	Range Along Strike(km)	Range Cross Strike(km)
Ni	0.2	0.8	20	20
Co	0.2	0.8	30	30
Cu	0.2	0.8	30	30
Mn	0.2	0.8	50	50
Abundance	0.2	0.8	30	30

Figure 11.36 Variogram map for nickel, NORI Areas A, B and C



Where possible, variogram model parameters were retained at similar values between orientations, and between the different variables, so as not to produce artefacts in the estimations. This was done to ensure element relationships or correlations evident between samples were respected implicitly during estimation and reflected in the resource estimate. Also, the same type of variogram model was fitted to the experimental variograms.

Gaussian variogram models were fitted to the experimental variograms. Typically, spherical models are sufficient for modelling the spatial continuity, but in this case the Gaussian model better fit the data. Gaussian models give greater weight to the very close samples (in the range of 0 to 5 km) and then rapidly decay to the sill compared with the spherical model. This fits in with the likely short-range variability possibly being controlled by the ridges, which are of the frequency of 3 to 5 km and oriented approximately north-northwest.

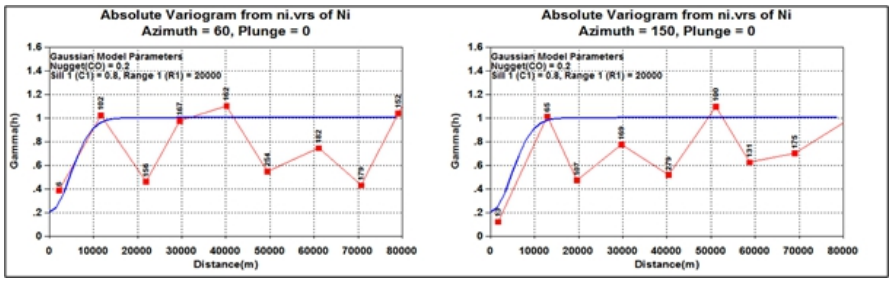
The directions of greatest continuity from the variogram maps is 060° and 150°, which are roughly parallel and orthogonal to the broad regional trend of the CCZ. Smaller scale local trends oriented parallel with ridges are not visible in the wide-spaced data.
The long-range experimental variograms for abundance are erratic with an almost nugget model.

Additional variogram parameters used in most cases for variogram calculation include:

- Single structure Gaussian models with common nugget and incremental sill levels.
- Lag distance of 5 km.
- Horizontal search angle of 15°.
- Vertical search angle of 15°.
- Horizontal distance of 30 km.

Major and semi-major variograms for nickel are shown in Figure 11.37.

Figure 11.37 Major and semi-major variograms for nickel (red line is actual data and blue line is modelled curve)



11.3.7 Geological block model

The block model contains 931 blocks, representing nickel, cobalt, copper, manganese, and abundance of polymetallic nodules. The model was built using the model framework defined in Table 11.24 and with additional block attributes listed in Table 11.25. A vertical block size of 1 m was used, essentially creating a two-dimensional model. The 1 m thickness is simply to give the blocks a default value. The tonnage of nodules in each block was estimated from the surface area of the block multiplied by the abundance estimate.

Blocks were added to the model using the limits of the NORI Areas. Parent blocks were split into sub-blocks to ensure reasonable resolution of the tenement boundaries.

Table 11.24 NORI Area A, B and C block model framework (UTM coordinates).

	Easting	Northing	Elevation
Model origin (m)	195000	1093000	–0.5
Model limit (m)	775000	1653000	0.5
Model extent (m)	580000	560000	1
Parent block dimensions (m)	10000	10000	1
Number of parent blocks	58	56	1
Minimum sub-block size	500	500	1

Table 11.25 NORI Area A, B and C model variables.

Variable	Type	Description
AREA	alphanumeric	Tenement area (A to D)
Ni	numeric	Estimated Ni weight % value
Co	numeric	Estimated Co weight % value
Cu	numeric	Estimated Cu weight % value
Mn	numeric	Estimated Mn weight % value
Abundance	numeric	Estimated nodule abundance wet kg/m^2

The total area of the block model is 74,840 km^2 which is 100.01% of the actual total area of the NORI Area of 74,830 km^2. This indicates that the sub-blocks were adequate for estimating the NORI Area boundaries.

11.3.8 Estimation of nodule abundance and grades

Ordinary kriging (OK) was used to estimate nickel, cobalt, copper, manganese, and abundance in the block model. Grades were estimated on a parent block basis using block discretisation of 3 by 3 by 1. Grades were also estimated using IDW to the power of 2 and NN for validation of the OK estimates.

To ensure that all blocks in the model had values for nickel, cobalt, copper, manganese, and abundance, a three-pass elliptical search strategy was used for selecting the neighbouring samples for estimation. Dimensions of the search ellipse radii were based on the ranges of the variogram models and average sample spacing. The search pass ellipse radii that were used are:

- PASS 1: 30 km by 30 km.
- PASS 2: 60 km by 60 km (pass 1 expanded by a factor of 2).
- PASS 3: 90 km by 90 km (pass 1 expanded by a factor of 3).

A minimum of 1 and a maximum of 8 samples were allowed per octant for each search pass, with a minimum of 4 and maximum of 32 samples per estimate. The required minimum number of samples per estimate was relaxed to 1 sample for the third search pass. The relatively large number of samples used in the estimate will ensure the estimates are smoothed for this early stage of evaluation.

To complete the block estimates and avoid potential issues for missing grades the third and final search passes used large search radius to ensure most relevant blocks were assigned estimated grades. This ensured that nearly all mineralised blocks were assigned estimates. Any remaining unassigned grades were set to 0.01% for nickel, cobalt, and copper, and to 26.86% for manganese.

11.3.9 Cut-off grade

Due to the extremely low variance in the grades and the high metal content of the nodules, a cut-off based on abundance is appropriate for determining the limits of economic exploitation. A cut-off of 4 kg/m^2 abundance was chosen for the NORI Contract Area, based on the estimates of costs and revenues presented in this report. The method of calculation for the cut-off determines the minimum average nodule abundance needed during steady state operations such that the revenue minus costs (excluding capital) is greater than zero. Revenue includes metal pricing and metallurgical processing recoveries, and the costs include the collection, transport, processing, corporate costs, and royalties.

The metal prices assumed in the calculation of the cut-off were: nickel metal $16,472/t; nickel in nickel sulphate $18,807/t Ni; copper metal $6,872/t; cobalt metal $46,333/t; cobalt in cobalt sulphate $56,920/t Co; manganese in manganese silicate $4.50/dmtu. The price estimates are long term (2034 – 2046) forecasts provided in a report by CRU International Limited (CRU, 2020). The Qualified Person considers that this timeframe is reasonable in view of the likely time required to bring the majority of the NORI mineral resources into production.

11.3.10 Mineral Resource classification

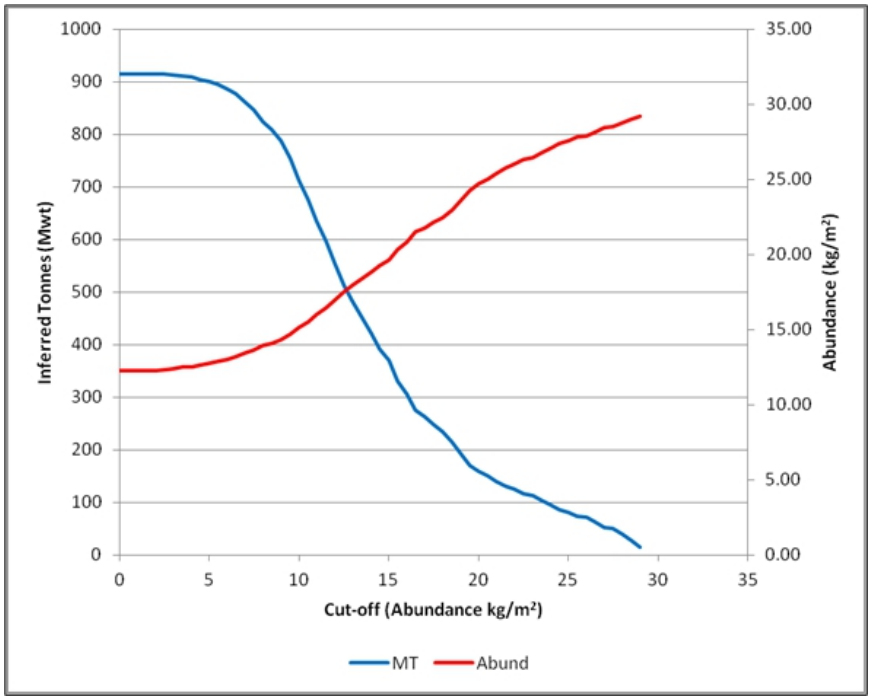
Resource classification was done on the basis of the quality and uncertainty with the sample data. Accordingly, NORI Areas A, B and C are considered to have sufficient continuity to warrant Inferred Mineral Resource classification in accordance with
SEC Regulation S-K (subpart 1300).

In the Qualified Person's opinion, the Mineral Resources have reasonable prospects of economic extraction. No fatal flaws have been identified. It is reasonable to expect that, with further engineering design and testwork, the technical and economic factors relevant to the collection of nodules and the extraction of nickel, cobalt, copper and manganese products from the nodules can be resolved. Accordingly, it is the Qualified Person's opinion that all issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

11.3.11 Estimation Results

The nodule abundance and tonnage curves for various nodule abundance cut-offs (kg/m^2) are presented in Figure 11.38. The curves indicate rapid reduction in global tonnage between abundance cut-offs of approximately 6 to 20 kg/m^2, which brackets the mean abundance for the NORI Area.

Figure 11.38 NORI Area A, B and C Mineral Resource abundance tonnage curves



The Mineral Resource, with an effective date of 31 December 2020, is reported in Table 11.26 at an abundance cut-off value of 4 kg/m^2. This cut-off is justified by the estimates of costs and revenues presented in this Initial Assessment.

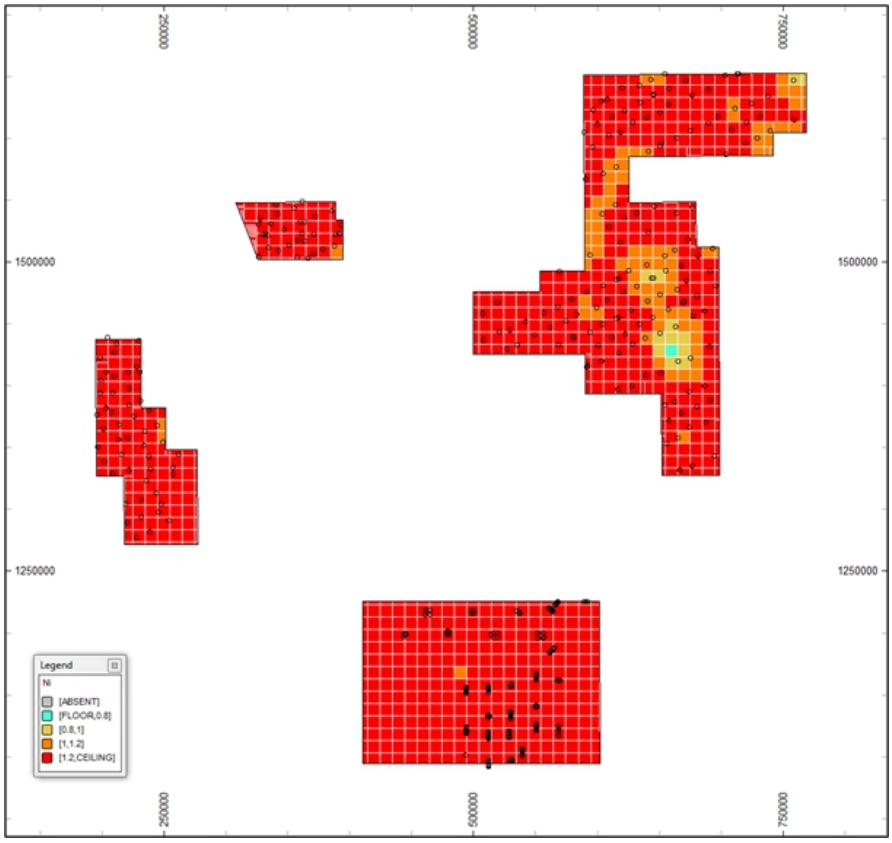
Table 11.26 NORI Area A, B and C Mineral Resource estimate, in situ, at 4 kg/m^2 abundance cut-off

NORI Area	Category	Nodule tonnage (Mt (wet))	Abundance (wet kg/m^2)	Ni (%)	Cu (%)	Co (%)	Mn (%)
A	Inferred	72	9.4	1.35	1.06	0.22	28.0
B	Inferred	36	11	1.43	1.13	0.25	28.9
C	Inferred	402	11	1.26	1.03	0.21	28.3

Source: Golder 2015. Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 24% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

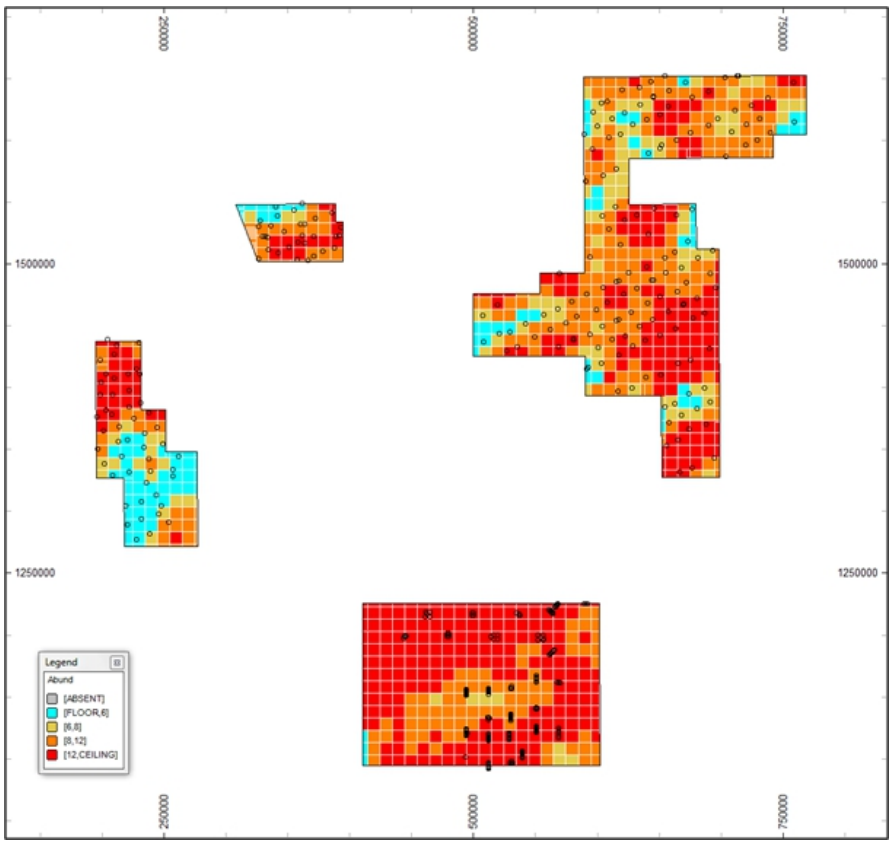
Figure 11.39 shows sample locations and estimated block grades for nickel (similar plots for copper, cobalt, and manganese are included in Appendix C). Figure 11.40 shows sample locations and abundance within the NORI Area. The figures indicate there is continuity of grade and abundance at ranges (40 to 80 km) several times greater than the average sample spacing. The patterns in distribution appear consistent between nickel, copper, cobalt, and manganese, reflecting the homogenous nature of the nodule chemistry across the NORI Area.

Figure 11.39 Map of sample distribution and block model estimates of nickel, NORI 2012 estimates



NB: Areas A, B, C and D cover several UTM zones but were overlaid to facilitate modelling of all areas in one model. The apparent distances between the Areas in this figure are not real distances.

Figure 11.40 Map of sample distribution and block model estimates of abundance, NORI 2012 estimates



12 Mineral Reserve estimates

There are no Mineral Reserve estimates for the NORI Property, and the potential viability of the Mineral Resources has not yet been supported by detailed mine design or optimization processes nor a pre-feasibility study or a feasibility study.

13 Mining methods

This Section provides a description and operating concept for the proposed nodule collection at NORI Area D. The seabed system is an extrapolation of existing technologies in deep ocean operations and previous seabed development activities. Much of the technology is a direct derivative of previous experience in nodule developments, such as consortium activities in the 1970s, including significant pilot testing, and advances in deep water oil and gas development. There still remain particular component and sub-systems that are not “off-the-shelf” and require further development. The technical readiness of some of the described components and assumptions need to be verified by further testing.

13.1 Development plan

NORI proposes to implement the project in multiple phases that will allow the seafloor production systems to be tested and then nodule production to be gradually ramped up. The phased approach will facilitate de-risking of the project for relatively low initial capital investment. The proposed development phases are as follows:

- The Collector Test is designed to perform proof of concept for the methods of collecting and lifting the nodules while acquiring sufficient data to design a commercial system. Nodule collected during the Collector Test would be stored on the Hidden Gem and brought to shore for use in large scale process pilot testing. The Collector Test would use a converted sixth generation drillship, the Hidden Gem. The Collector Test would not demonstrate the transhipment of nodules to a shore-based facility.
- Project Zero would be an extension of the Collector Test using an upgrade of the converted drillship to produce a sufficient and continuous quantity of nodules to support a relatively small commercial operation of about 1.3 Mtpa (wet) nodules delivered to a shore-based facility. This operation would demonstrate a more continuous mining operation at a larger scale than the Collector Test and would demonstrate the transhipment of nodules to a processing facility. This initial commercial system would operate for five years.
- Project One would increase production in a further three steps:

    — a further upgrade of the Hidden Gem for up to 3.6 Mtpa (wet) production, for a 20-year production life.

    — introduction of a second converted drillship (Drill Ship 2) with a capacity of up to 3.6 Mtpa (wet), designed for a 20 year production life.

    — construction of a new purpose-built production support vessel (Collector Ship 1) with capacity of up to 8.2 Mtpa (wet). Project One would benefit from lessons learned on the Collector Test and Project Zero.

All projects involve similar methods for collection of nodules: a self-propelled collector using hydraulic methods to pick up the nodules from the seafloor, and an airlift driven riser and lift system (RALS) to raise the nodules to the surface. Project Zero and Project One would both deliver nodules in the form of a slurry to a bespoke converted bulk mineral carrier positioned aft of the production support vessel (PSV) and connected by floating slurry hoses. The nodules delivered to the transport vessels would be dewatered and placed in the cargo holds, while the water would be returned to the PSV via separate floating hose and disposed of at some depth through a special riser fall pipe.

The main differences are in the specific vessels (converted drillship or new build), the number of collectors operating in tandem and the scale of the operation.

13.2 Off-shore system concept

The off-shore system concept for Collector Ship 1 is illustrated in Figure 13.1. Nodule collection will be managed from PSVs on the surface. The nodules will be collected from the seafloor by self-propelled, tracked, collector vehicles. The collector design includes technology for reducing or eliminating the introduction of sediment into the lift system. This technology is being developed by Deep Reach Technology, Inc. under funding from the U. S. Department of Energy. Deep Green is participating in this research by contribution sediment samples from the NORI Area D box cores.

Material collected by the collector vehicles will be pumped into a concentrator / hopper where fine material and excess water will be separated, yielding a higher concentration slurry, which will be transferred via flexible hoses to the RALS. The RALS consists of steel riser pipe engineered with varying diameter and bundled with buoyancy and other auxiliary lines. The sub-sea flexible hose and RALS architecture is based almost entirely on standard deep-water components from the upstream oil and gas industry.

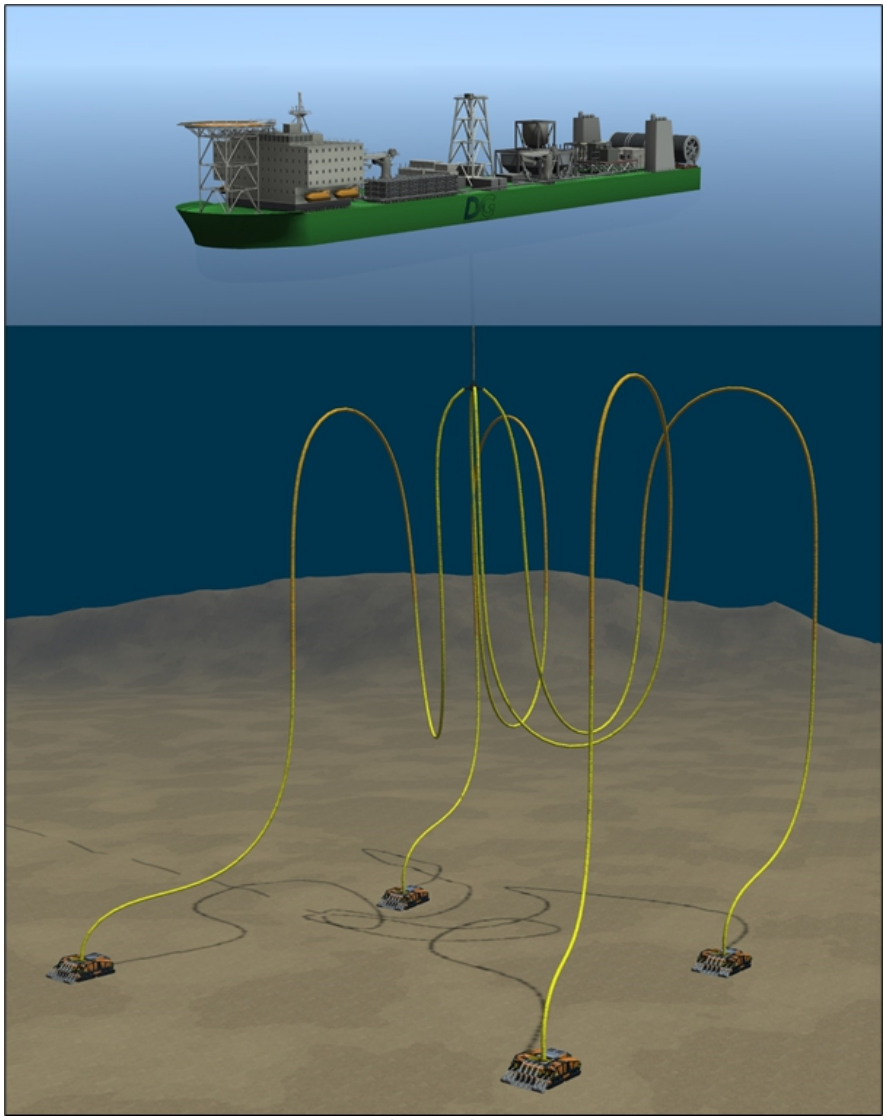
Lifting will be accomplished using an airlift method. Compressed air will be inserted in the riser pipe at approximately 1,500 m depth, resulting in low density in the mixture above this point. The density difference causes suction in the lower section of the RALS, which results in lift of the nodule slurry. Airlift systems were proven during trial nodule recovery operations at site in the 1970s (Lecourt & Williams, 1971, Kaufman, Latimer, & Tolefson, 1985, Shaw, 1993) and are currently used in shallow off-shore diamond mining operations in South Africa at approximately 120 m depth (MHWirth, 2020).

To achieve a high-efficiency airlift operation, and to limit the exit velocities, the discharge of the airlift mixture will be pressurised to 800 kPa. The slurry will first be discharged into a pressurised surge tank and subsequently fed to a pressure let-down system to reduce the pressure to atmospheric. The flow from the pressure let-down system will be either pumped to a transport vessel or, if a transport vessel is not connected, to buffer storage tanks on board the PSV.

The collector vehicles will make parallel, linear traverses of the seafloor. Long collection paths are regarded as favourable as that will minimize the number of turns required to start a new collection path. The collector vehicles will turn 180˚ in a wide arc, by operating the inner and outer tracks at different speeds. The PSV will adjust its position and the position of the RALS in coordinated movements.

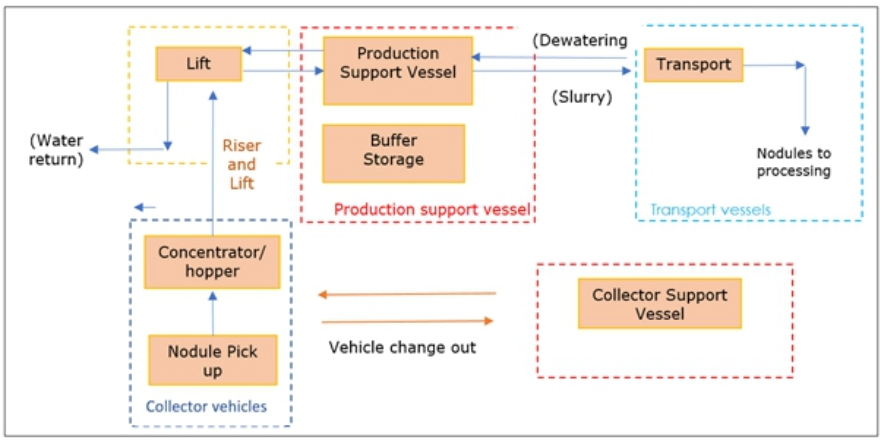
Figure 13.2 is a schematic diagram of the overall flow process in the extraction operation.

Figure 13.1 Overall extraction operation



Source: NORI

Figure 13.2 Flow of nodule material



The basic design parameters adopted for the off-shore systems are presented in Table 13.1. The parameters are updated from a scoping study by Deep Reach Technology, Inc. (2015). The nodule recovery efficiency is based, in part, on tests performed in the 1970s for KCON by Marconaflo Corporation on a decanted sample of a nodule slurry produced in a pump loop simulating comminution in a lift pump system. System availability is an average including allowances for periodic (5-year) special surveys of the vessel requiring drydocking. The nodule production sequence and the financial model consider the timing of these surveys.

Table 13.1 Key design data for off-shore systems

Parameter	Project Zero	Project One	
Maximum annual production (Mtpa (wet))	1.3	3.6	8.5
Nodule abundance (kg/m^2 (wet))	20	20	20
Mining recovery efficiency (%)	77%	77%	77%
Annual system availability (days)	229	229	267
Maximum seabed slope	6°	6°	6°
Moisture content of dewatered cargo	10%	10%	10%
Size distribution of dewatered cargo	95% minus 16 mm, 5% minus 0.5 mm	95% minus 16 mm, 5% minus 0.5 mm	95% minus 16 mm, 5% minus 0.5 mm

13.3 Geotechnical considerations

The physical characteristics of the seafloor sediments will have important influence on the mobility of the collector vehicles, the detailed design of the collection path, and the volume of sediment that will be disturbed by production activities. Little data was available for NORI Area D prior to 2018 but, as described in Section 9.35 and 9.4.4, NORI systematically collected geotechnical measurements from box core samples in Campaigns 3, 6A and 6B (Fugro, 2019). Analysis of the data is still at an early stage.

UTEC Geomarine (UTEC) completed a review of the track selection and sizing of the collector vehicle, as part of the scoping study project completed by DRT. For the purpose of the scoping study, it was assumed that the subsea collector will be self-propelled and use either a tracked system with skid steering or an Archimedes Screw Driven (ASD) system. UTEC noted that tracked systems have been proven reliable and versatile system for subsea vehicles such as mining vehicles and trenching machines, whereas ASD vehicles have only been proven for land-based usage.

The geotechnical parameters used as input to the study were based on a report on the sediments cored on Leg 86 of the Deep-Sea Drilling Project (Schultheiss, 1985), this document was not sighted by AMC as part of this review. The report considered the track designs for sea floor clays with the material strength parameters presented in Table 13.2.

Table 13.2 Geotechnical properties of clays defined by UTEC, 2015.

Depth (m)	Shear Strength (kPa)	Submerged Unit Weight (kN/m^3)
0–5	2–7	2.74

Using the parameters in Table 13.2 UTEC calculated:

- Maximum bearing pressures, for clays with a uniform shear strength of 2kPa and 10kPa.
- Mobility envelopes for clays with a uniform shear strength of 2kPa and 10kPa.
- Immediate settlement was only calculated for clay with a uniform shear strength of 10 kPa.
- The effect of the collector vehicle loading on slope stability for slopes between 2^o and 20^o.

A range of vehicle loads were studied over a range of slopes, both in roll and in pitch, in varying soil strengths. UTEC noted that it was difficult to draw any firm conclusions although it appeared that slopes of greater than about 3˚ to 5˚ have the potential to generate stability difficulties for the collector vehicle.

UTEC provided recommendations to DRT for the track area and submerged weights for the collector vehicle, based on estimates of the ultimate and dynamic bearing capacities. UTEC also recommended further investigation into the efficiency of skid-steering, and the dynamic effects of the collector vehicle on the bearing capacity of the sea floor clays.

During the Campaign 3 box coring program, undisturbed samples were brought to the surface and either sent for laboratory testing or were subject to testing on board the ship. The Campaign 3 data suggests that below the top 400 mm the shear strength range considered in the UTEC report is valid. Very low residual shear strengths were also recorded, with undrained shear strengths between 0.5 and 1.5 kPa below 400 mm. These very low residual strengths would result in soft or boggy conditions in high traffic areas depending on ground disturbance. At the mine design stage, the collector paths are to be designed to minimize movement over previously disturbed areas.

Submerged unit weights below 400 mm were estimated to vary between 1.65 and 2.25 kN/m^3. These values are lower than the 2.75kN/m^3 used by UTEC in their stability analysis work. Potentially this could reduce slope stabilities further when a loading is applied to the slope.

The geotechnical data collected during Campaign 6A and 6B provided more detailed characterization of the seafloor sediments and produced results broadly consistent with the earlier testing.

Based on the geotechnical reports provided, the seabed will comprise around 110 mm of dark brown clayey silt sludge overlying a very soft yellow brown, clayey silt. The yellow brown clayey silt has a typical undrained shear strength between 3–10 kPa, which is consistent with the assumptions in the 2015 UTEC study.

Further stability analysis and 3D numerical modelling are required to improve the reliability of the geotechnical assessment. The Collector Test will provide critical information and allow calibration of performance of the collector vehicle on a range of slope angles. This will provide a basis for improvement of design and operating parameters.

13.4 Collector Test and Hidden Gem conversion

NORI plans to conduct a Collector Test in 2022. This will test the systems for nodule collection and will have a design production rate of 1800 tpd (wet), or about 75 tph, but it will not transport nodules to shore.

NORI entered into a contract with Allseas Group S.A. (Allseas), in July 2019, to develop and deliver the Collector Test. DeepGreen also entered into a strategic alliance agreement with Allseas, where Allseas will undertake the development and operation of a system to collect 200 Mt of nodules from NORI Area D. In February 2020, Allseas acquired the Hidden Gem, a Samsung 10,000 drillship, to undertake the Collector Test and with the aim of supporting Project Zero Figure 13.3.

Figure 13.3 Hidden Gem drillship (courtesy Allseas)



Source: NORI

Allseas (Bosland, 2020) proposes to convert the Hidden Gem from 6th generation drillship to a vessel to support the Collector Test, as follows:

- The Hidden Gem would be refurbished and recertified for the Collector Test under Lloyds Rules. Thrusters will be removed and seals replaced during the docking period, before reinstalling.
- The main derrick and associated riser handling equipment will be reactivated and certified. All equipment for handling drill pipe and perform drilling operations that is obsolete for the intended prototype test will systematically be isolated from the operating systems, maintenance seized and ultimately be removed from the vessel. This will include drill pipe, top drive, marine riser, mud pumps etc.
- All cranes will be certified and operations including man riding certificates.
- For mining operations, the Hidden Gem will be equipped with a prototype mining collector and 4.2 km 8” airlift riser, corresponding to a 20% prototype scale. The system will have a production capacity of 420 ktpa (wet).
- The collector dry weight is 75 t. The collector nozzle array spans 6 m width and can travel at maximum 0.5 m/s.
- The collector comes with a dedicated launch and recovery system (LARS) rated 90 t safe working load (SWL) that can deploy a <10m wide collector. For the deployment it will use its 1MW aramid reinforced umbilical, with a 35 t SWL. The LARS will be installed on portside aft between frames 49 and 55.
- Nodule collection operations will be supported by a dedicated deep-water WROV from Schilling rated for operational water depths up to 4,500 m. Launch and recovery will be from starboard aft between frames 30 and 35.
- The crude oil tank between frames 67 and 76, with 5910 m^3 capacity will be converted to store the 3,600 t of nodules that will be collected during the Collector Test. This tank will have a top hatch that allows access after Collector Test to offload the 3600t nodules using bulk grab and mobile bob cat lowered onto the tank top.
- Nodule dewatering and separator placed on main deck on top of nodule storage tank. Separator will be a double shaker deck that can process 80t/hr. It includes the permanent work consisting of piping from riser head and to storage tank.
- Flexible TCP jumper hose ID 7”, including connectors and buoyancy to connect the collector to riser base in a submerged lazy-S configuration. Jumper hose has dedicated reel and a LARS for deployment over the vessel side starboard aft of drill tower between frames 75 and 80.
- Containerised air compressor spread will be demobilised after the Collector Test. The base case for the Collector Test is to rent three containerised sets. Piping to connect and supply will remain as part of the permanent work.

13.5 Project Zero

NORI plans to commence commercial operations on a small scale (Project Zero) with low capital cost, using the Hidden Gem with further modifications after the Collector Test.

Project Zero would initially deliver up to 1.3 Mtpa (wet) of nodules to a shore based processing or stockpiling location (transportation and logistics are discussed in Section 18). This project phase will serve as a proof of concept of the entire mining operation (including pyrometallurgical processing).

Project Zero will be designed to produce for up to 5-years before dry docking for refurbishment. The results of initial operations will be used to optimize the design for Project One.

NORI asked DRT to evaluate upgrade of the Hidden Gem from the Collector Test to Project Zero. DRT's evaluation (Deep Reach Technology, Inc., 2020) is based on the information received from Allseas (Bosland, 2020), regarding the conversion of the Hidden Gem from 6th generation drillship to a vessel to support the Collector Test. Based on this information and assessment of the drawings and specifications of the original Vittoria 10,000 Samsung drillship, DRT assumed that upgrading the Hidden Gem for Project Zero, would involve these steps:

- Addition of collector heads and modifications to the existing Collector Test collector to achieve 8.7 m effective collection width.
- Upgrade of the LARS umbilical winches to accommodate a larger umbilical for deploying the collector and powering it.
- Adding airlift pressure let-down system.
- Adding a compressor module to drive the airlift.
- Replacing the Collector Test 8" riser with a 12" riser with appropriate larger diameter sections for the airlift.
- Adding a decanting weir to the buffer storage for gravity separation.
- Adding a hopper and re-slurrying equipment (in-tank Dyna-Jets) to the buffer storage tank for offloading.
- Adding a material handling system including piping, pumps, offloading reels with hoses to transfer nodules to a transport vessel.

Other than the information presented above, DRT has not participated in any design reviews nor is DRT privy to detailed information about the Collector Test design. The assumptions DRT has made need to be verified.

The transport model for Project Zero indicates that two 35,000 dwt bulk mineral carriers are required assuming the nodules will be transported to a port on the west coast of Mexico. Under the assumed conditions the loading time is greater than eight days, and the queuing model indicates a returning vessel would arrive while the other vessel is being loaded. The loading time includes interruptions for collector maintenance. The minimum buffer storage, to avoid shut down for transport unavailability, would be the time to break a connection and makeup a new connection, or about 6 – 8 hours. This corresponds to about 2,700 t minimum buffer capacity required, which is within the capacity given above for the Collector Test.

13.6 Project One

Project One would be the progressive implementation of larger scale operations to ultimately achieve nodule production of up to 14 Mtpa (wet) from three vessels.

The Hidden Gem would be upgraded to include two 12 m collector vehicles and a larger riser to achieve a nominal capacity of up to 3.6 Mtpa.

A second modified drillship, Drill Ship 2, would also be commissioned with two 12 m collector vehicles.

Hidden Gem and Drill Ship 2 would be joined by a new purpose-built PSV, Collector Ship 1, that would commence production in 2026 with two 12 m wide collectors. A third collector would be added at the end of 2026 and a fourth at the end of 2027. All collectors would operate in tandem and would be connected to a single production riser as illustrated in Figure 13.1 for four collectors. Operations would also be boosted by the introduction of a Collector Support Vessel dedicated to maintenance of the collector vehicles deployed by Collector Ship 1. When fully operational, there will be eight collectors in production supported by three PSVs (Hidden Gem, Drill Ship 2 and Collector Ship 1). Project One will benefit from lessons learned on the Collector Test and Project Zero.

13.6.1 Upgrade of the Hidden Gem

After the Hidden Gem has operated for five years at 1.3 Mtpa, it would be upgraded to be capable of producing up to 3.6 Mtpa for a 20-year design life. The upgrade includes engineering, procuring and integrating the following changes/additions:

- Increasing riser diameter from 12” to 16” and adding buoyancy to maintain the top tension withing the derrick capacity of the drillship.
- Increased air compressor capacity to operate the air lift riser for the design production rate.
- Refurbishment of the hull structure and coatings to achieve the design life of 20 years with minimal steel renewal at special survey drydockings.
- Providing collector equipment redundancy to provide the reliability and availability to achieve the total annual nodule production tonnage required.
- Providing additional electrical switchgear and motor control centres (MCCs) to operate the additional redundant mining equipment.
- Relocate and upgrade the collector LARS system from the port side aft to the starboard side forward of the moonpool where space exists to handle, store, and maintain larger collectors on deck. Figure 13.6, Figure 13.7 and Figure 13.8 illustrate the proposed changes to the Hidden Gem deck plan.
- Providing two additional 7 MW power generation units to provide additional power for larger air compressor capacity.

Two 12 m wide collectors will be operated in tandem. The existing flexible jumper hose power reel and collector umbilical system will be used but a second new flexible jumper hose reel, and collector umbilical system will be purchased to enable the installation and operation of a second subsea collector.

The collector umbilicals will be integrated with the riser. The concept of operations for collector maintenance in Project One will require adding the capability to make and break umbilical connections on the seafloor, whereas in the Collector Test and Project Zero the collector umbilical will be used for lowering and raising the collectors. Both Project Zero and Project One will require a subsea disconnectible connection between the collector and flexible jumper, and the riser and flexible jumper.

The 12” riser will be replaced with a 16” riser to accommodate 3.6 Mtpa production (about 16,000 tpd wet). Larger upper sections will be added for more air volume. The flexible jumper and riser from the 1.3 Mtpa case will be replaced with a larger flexible jumper.

Additional buffer storage will be required to meet the minimum storage requirements for transport. Tanks that could potentially be used for buffer storage are identified in Table 13.3. Tanks aft of the moonpool would provide the most accessibility. For this IA we assume that two additional crude oil tanks between frames 67 and 76 will be converted to buffer storage tanks to achieve approximately 15,000 m^3 of storage. Sloping sides and nodule re-slurrying equipment will be added. Further surveys would be required to determine the suitability of these tanks.

Figure 13.9 shows a process flow diagram for the material handling and offloading system.

Figure 13.4 Hidden Gem – original drillship profile

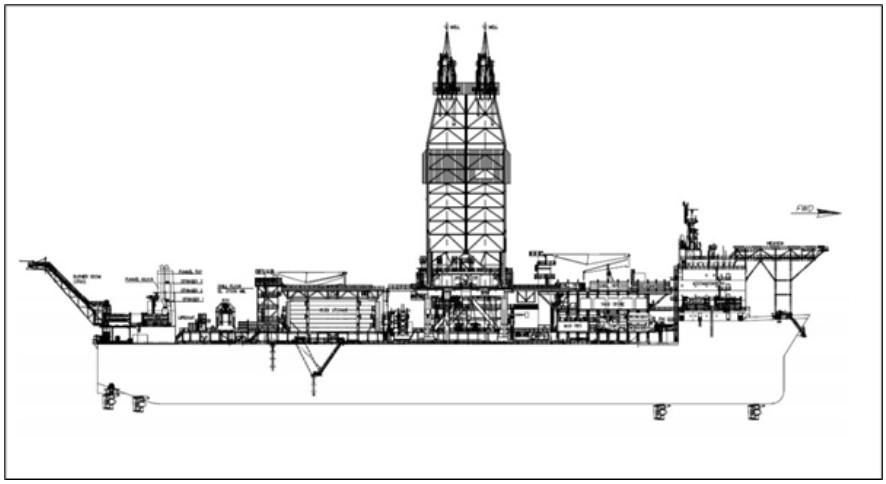


Figure 13.5 Hidden Gem - original drillship deck plan

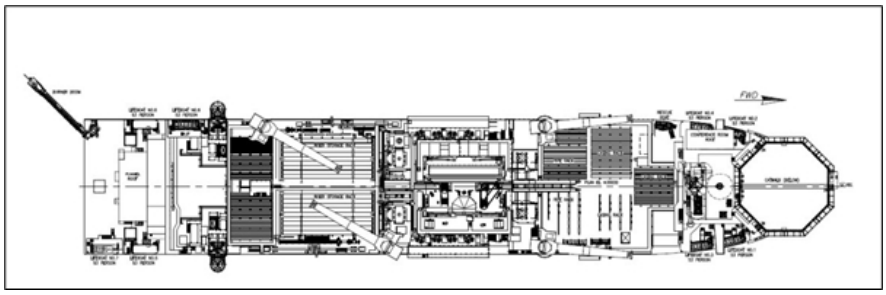


Figure 13.6 Hidden Gem - converted for Project Zero - profile

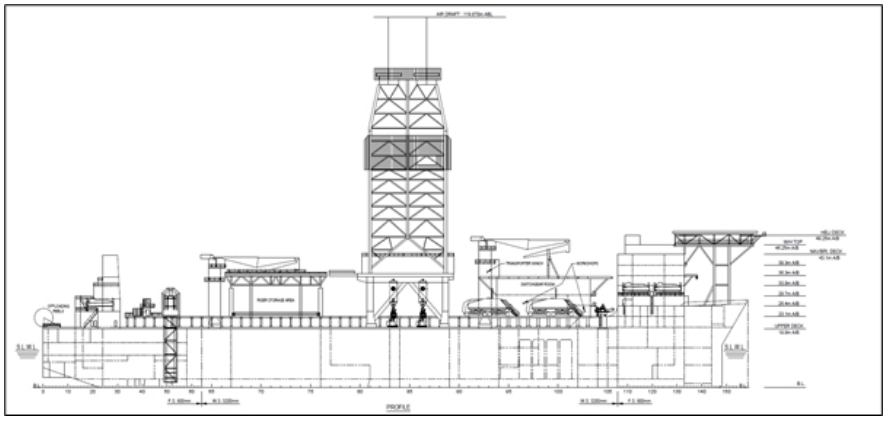


Figure 13.7 Hidden Gem - converted for Project Zero - deck plan

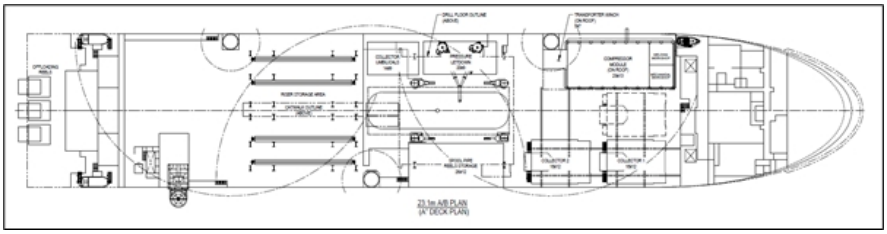


Figure 13.8 Hidden Gem - converted for Project Zero - sections

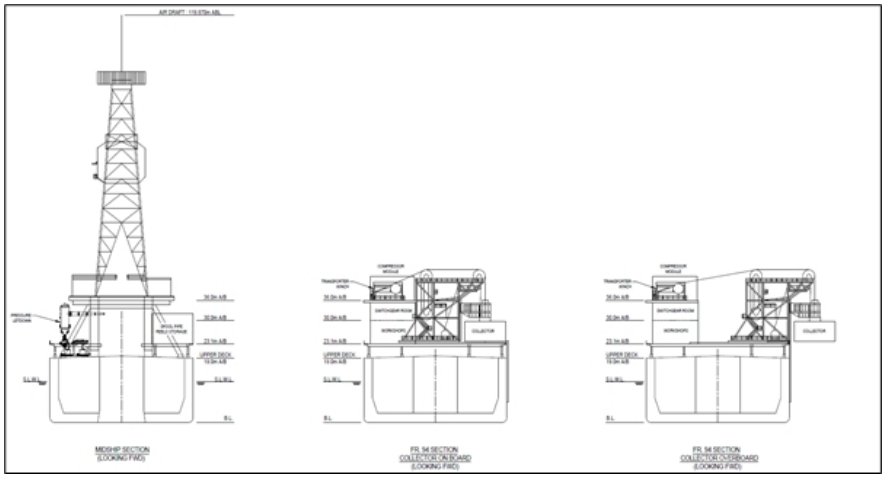
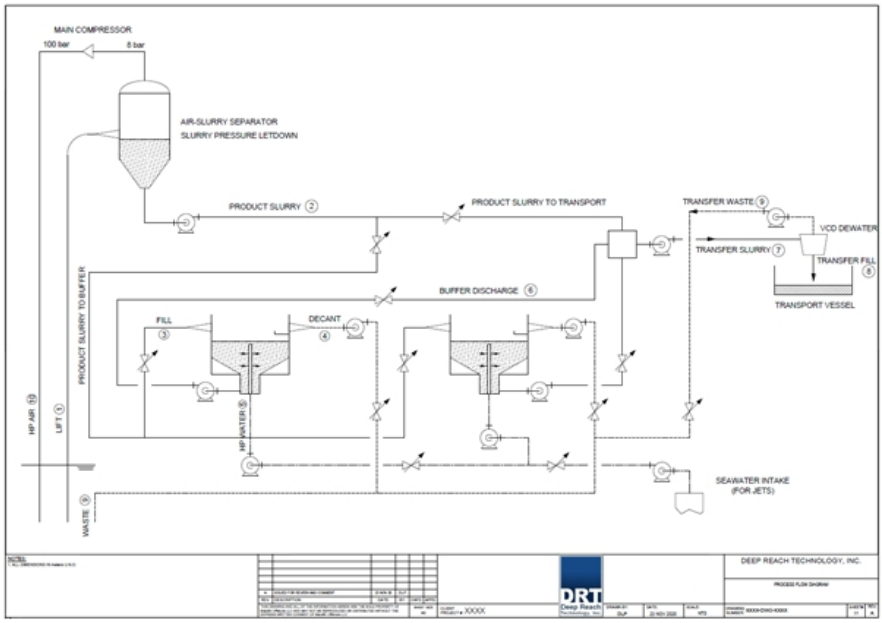


Table 13.3 Available Volume for storage of nodules on the Hidden Gem

Location	Length (m)	Width (m)	Height (m)	Volume (m3)
Tanks Below Riser Rack Area (FR67 to FR 76)				
C.O.T. Port	29	11	16	5,104
C.O.T. Center	29	12	16	5,568
C.O.T. Starboard	29	11	16	5,104
Tanks Moonpool Sides (FR76 to FR82)				
No.4 HOLD Port	22	11	16	3,872
No.4 HOLD Starboard	22	11	16	3,872
Tanks Moonpool Sides (FR82 to 89)				
No.3 HOLD Port	23	11	16	4,048
No.3 HOLD Starboard	23	11	16	4,048
Tanks Forward Moonpool (FR90 to 94)				
No.2 HOLD Port	13	11	16	2,288
No.2 HOLD Center	13	11	16	2,288
No.2 HOLD Starboard	13	11	16	2,288
		Volume Available (m3)		**38,480**

Figure 13.9 Material handling, dewatering and offloading systems



13.6.1 Conversion of Drill Ship 2

Conversion of Drill Ship 2 to a PSV assumes the same design as for the upgraded (3.6 Mtpa) Hidden Gem. However, the costs include refurbishment and conversion work that was performed on the Hidden Gem prior to the Collector Test.

It should be noted that vessel refurbishment and conversion costs are a function of the state of the vessel at the time of purchase and cannot accurately be estimated without a vessel survey and assessment. It is recommended that for the PFS or DFS phase specific candidate vessels be chosen for evaluation.

13.6.2 Collector Ship 1

The purpose-built PSV used in the cost estimate for Project One (Collector Ship 1) has been sized specifically for the NORI Area D project. The conceptual design is shown in Figure 13.10.

Figure 13.10 Collector Ship 1, production support vessel



Source: DRT

The Collector Ship 1 specifications are shown in Table 13.4. Collector Ship 1 will be similar in size to an Aframax or New Panamax class of tanker.

Table 13.4 Specifications for Collector Ship 1 PSV for Project One

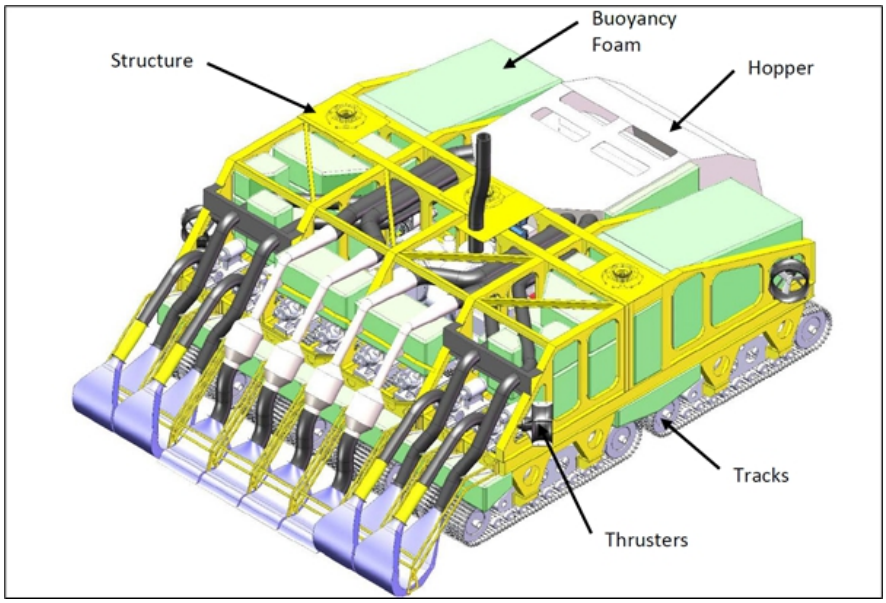
Parameter	Value
Length	225 m
Beam	38 m
Depth	20 m
Design draft	13.5 m
Displacement	103,000 t
Deadweight tonnage	79,000 t
Nodule buffer storage	60,000 t cargo ~ 48,000 t nodules
People on board	120
Installed power (approx.)	100 MW

All the PSVs will be equipped with controllable thrusters and will be capable of dynamic positioning (DP), which will allow the vessel and riser to track the collectors. The airlift system will include a main compressor and makeup and booster compressors, which will be integrated on the PSV. All power for off-shore equipment, including the nodule collecting vehicles, will be generated on the PSV.

13.6.3 Collector vehicle

The off-shore system will incorporate self-propelled, tracked, collecting vehicles
Figure 13.11. The collectors will traverse the seabed in a pre-determined pattern at a speed of up to 1,800 meters per hour (up to 0.5 m/s). Suction dredge heads on each collector will recover a dilute slurry of nodules, sediment, and water from the seafloor. A hopper or slurry concentrator on each vehicle will allow the larger, heavier nodules to fall into the underflow where they are to be pumped as a higher concentration slurry (in terms of nodule density) to the riser through flexible hoses. Excess water and sediment will pass out of the hopper overflow.

Figure 13.11 Preliminary design for the collector vehicle



The vehicles will be of comparable size and weight to the largest pipeline trenching machines used in deep water in the upstream oil and gas industry. Trenching machines have been used for years for the trenching, burial, and maintenance of pipelines and power cables, and for ploughing operations for burial depths greater than 1.5 m. The collectors will also be of comparable size and weight (in air) to the large machines that were built for seafloor massive sulphide mining in deep water, off-shore Papua New Guinea (for Nautilus Minerals Inc., in 2015), albeit that those machines are designed to operate on a seafloor composed of hard rock.

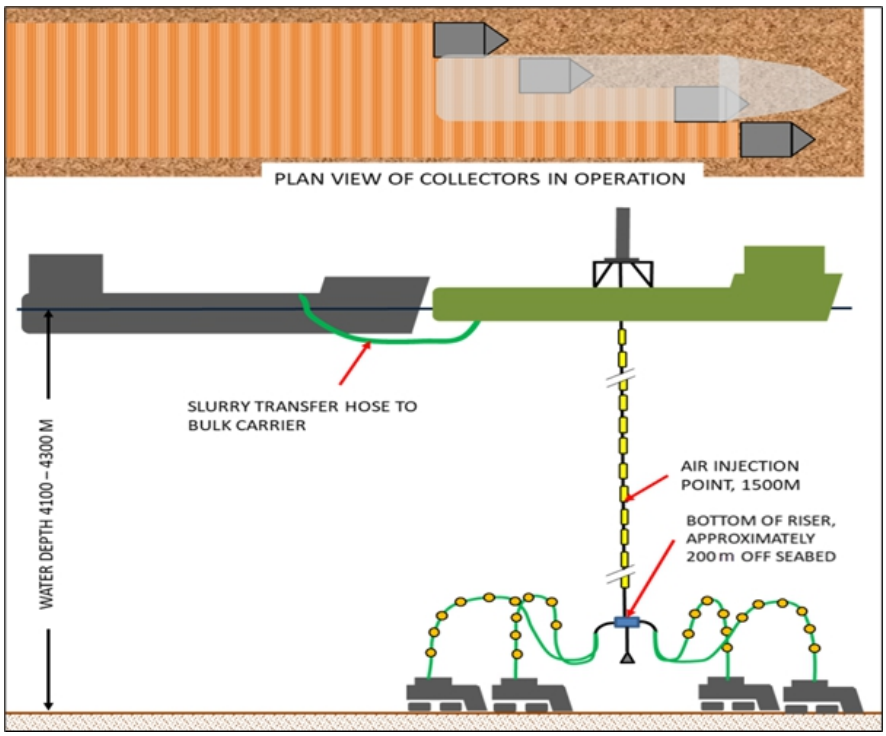
The specifications of the collector vehicles are summarised in Table 13.5 and compared to an oil and gas trenching machine and Nautilus's bulk cutter. Several tests have been performed, and are being planned, for tracked vehicles in soft pelagic clays including in the CCZ. The NORI collectors will carry a substantial volume of buoyancy foam to control the machine's weight in water and therefore the bearing pressure.

Table 13.5 Collector vehicle specifications

Parameter	NORI's collector	Perry XT1500 trencher	Nautilus's bulk cutter
Length	18.4 m	9.4 m	15.0 m
Width	12.8 m	6.1 m	4.2 m
Height	5.75 m	3.9 m	
Weight in air	256 t	30.1 t	275 t
Weight in water	25 t	2.2 t	
Bearing pressure	1.5 kPa	2.8 kPa	
Undrained shear strength	2.0 kPa	2.5 kPa	-
Maximum transit speed	0.5 m/sec	0.7 m/sec	
Operating depth	5,000 m	1,500 m	2,500 m
Operating power	1,500 kW	1,100 kW	
Installed / peak power	2,050 kW	-	

During normal operations, the collectors will follow a predetermined path based on the analysis of site survey data and such considerations as nodule abundance, nodule grade, seabed topography, and any obstructions. Normal collecting operations are illustrated in Figure 13.12.

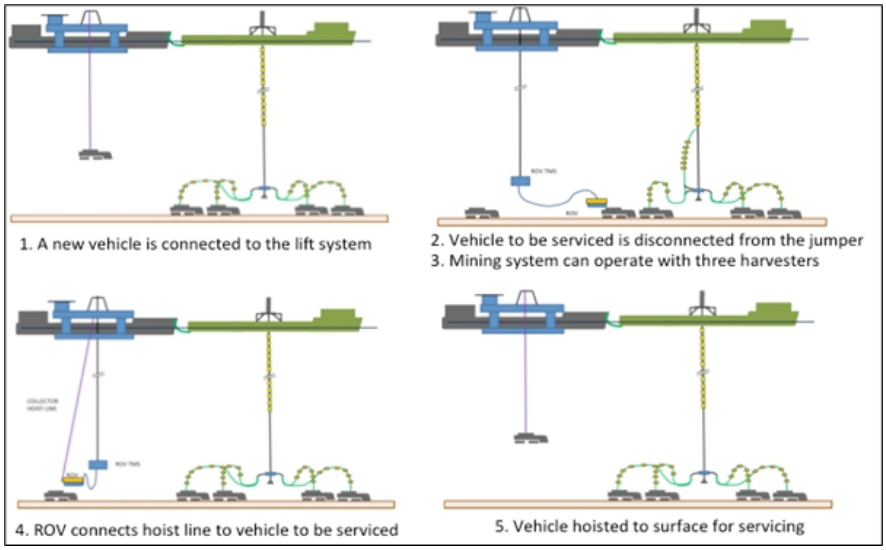
Figure 13.12 Normal collecting operations



The collectors will generally operate in semi-autonomous mode. However, an array of forward-looking obstacle avoidance imaging systems will process and report approaching terrain in real time and manual/supervisory control will be returned, as and when required.

In Project One, maintenance for the collector vehicles deployed by Collector Ship 1 will be performed by a separate collector support vessel (CSV). When a collector requires repair, either planned or unplanned, it will be disconnected from the jumper hose and power umbilical (which connect it to the RALS) by a remotely operated vehicle (ROV). The CSV will maintain a spare collector, which will be deployed by a wireline hoist to reconnect with the seafloor spread. The collector requiring maintenance will be hoisted to the surface by the CSV. The storyboard procedure for collector change out is shown in Figure 13.13.

Figure 13.13 Collector change-out operations concept



13.6.4 Plume mitigation

The collector described above picks up seafloor sediment along with the nodules it collects. The fine-grained sediment consists primarily of either the microscopic, calcareous or siliceous shells of phytoplankton or zooplankton; clay-size siliciclastic sediment; or some mixture of these. When the water and sediment are discharged from the nodule concentrator, or as excess water from shipboard dewatering of the nodules, a plume will be generated in the water column.

DRT was recently awarded a research grant by the U. S. Department of Energy, Advanced Research Projects Agency – Energy (Deep Reach Technology, Inc., 2021), to advance a concept for mitigating or eliminating the sediment plumes by:

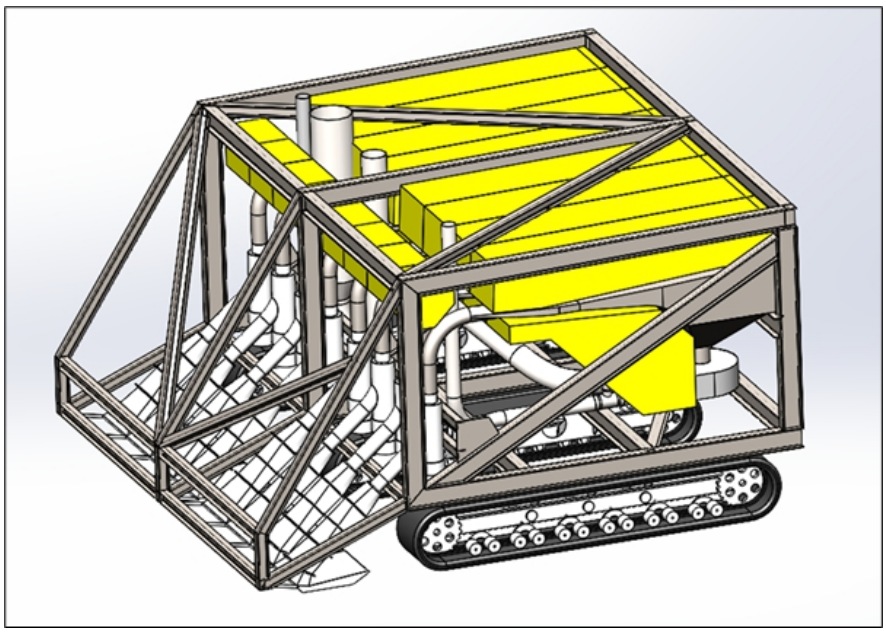
- Preventing all the sediment laden water from entering the lift system, thus eliminating sediment in the wastewater produced by dewatering (except for sediment and nodule fines released by nodule attrition, and

- Active flocculation of the sediment discharged from the collector using electrocoagulation.

NORI is participating in this research by providing sediment samples from NORI Area D for electrocoagulation tests.

The work to date has shown, in theory, that sediment can be eliminate from the riser by adding an additional pump to collect clean water for conveying nodules to the riser, and by implementing a special underflow mechanism that will allow control of a small amount of upflow in the separation hopper to prevent water from the pick-up head from entering the riser, while nodules (greater than about 5 mm) will pass to the riser. Figure 13.14 is a conceptual illustration of a collector with this concept. The collector costs used in this IA all have an allowance for adding this feature to the collectors. The addition of electrocoagulation, while showing promise, adds complexity to the collector and is still the subject of evaluation. Further government support is expected in 2021 to perform testing of both these concepts at a laboratory scale.

Figure 13.14 Illustration of collector vehicle with plume mitigation (patent pending)



13.6.5 RALS

13.6.5.1 Riser

The RALS will take in the combined slurry from the collector vehicles and deliver the slurry to the PSV via airlift. The main riser pipe will consist of three main sections. The lower section (RALS-1) will carry the two-phase slurry in nominal 28” outside diameter (OD) pipe from the collectors to the airlift injection location. The second section (RALS-2) will carry a three-phase mixture of slurry and air in 28” OD pipe. This section will also include three 12 ¾” OD auxiliary pipes. The former will carry the compressed air for the airlift system. The latter will carry the effluent from dewatering of the slurry to the discharge point. The depth of the discharge point is yet to be selected and will depend on plume modelling and other environmental considerations. The upper section of pipe (RALS-3) will have a larger diameter to account for the expansion of air in the airlift. It will also include the discharge and air supply piping. Umbilical cables for powering the collectors and carrying data will be attached to the riser.

The entire riser string will be supported on a detachable buoy that is latched into the moon pool of the PSV (an opening in the floor or base of the ship’s hull giving access to the water below). The buoy may be detached during a hurricane emergency. When this is necessary, the lower riser manifold will rest on the ocean floor on an emergency ground anchor and the riser string will be supported by the buoy about 100 m below the sea surface. This position is below the depth of high wave energy. This will enable the PSV to transit away from the storm area. After the hurricane has passed, the PSV will re-engage with the buoy. This process is identical to the operation of disconnectable risers on off-shore floating production and storage vessels in the Gulf of Mexico. The specifications of the RALS are shown in Table 13.6.

13.6.5.2 Airlift system

The airlift power will be derived from three compressors: a main compressor, a booster compressor, and a make-up compressor. The specifications of the airlift compressors for Project One Collector Ship 1 are shown in Table 13.7. These parameters are based on a nominal production rate of 6.4 Mtpa (wet) (Deep Reach Technology, Inc., 2015) and need to be upgraded for the modified design basis in this IA (up to 8.2 Mtpa). CAPEX and OPEX estimates in Section 21 have been scaled to account for this increased capacity. The main compressor used as a basis for the IA cost estimate is shown in Figure 13.15. It is an Elliott Group model 46M6I two-stage centrifugal compressor with inter-cooling. To control the compressor performance for varying loads due to variable nodule abundance on the ocean floor, for example, the compressor is equipped with adjustable inlet guide vanes.

Table 13.6 Riser pipe stack up

Riser Joint Type	Description	Weight In Air (mt)	Weight In Water (mt)	OD (m)	Number of Joints	Water Depth (m)
RALS-1	• Main Pipe 28" OD x 0.625" wt • 3" typ. Umbilical (4 each)	5.1	4.4	0.86	130	1500 to 4000

RALS - 2	• Main Pipe 28" OD x 0.625" wt
	• 3" typ. Umbilical (4 each)
	• Discharge Pipe (3 each)
	  ○ 12-3/4" OD x 0.5 wt
	• Air Supply Pipe
	  ○ 12-3/4" OD x 0.5 wt
	• Buoyancy Modules (4 each)
	  ○ 1.53 m OD
		23.7	0.4	1.53	47	600 to 1500

RALS – 3	• Main Pipe 36" OD x 0.75" wt
	• 3" typ. Umbilical (4 each)
	• Discharge Pipe (3 each)
	  ○ 12-3/4" OD x 0.5 wt
	• Air Supply Pipe
	  ○ 12-3/4" OD x 0.5 wt
	• Buoyancy Modules (4 each)
	  ○ 1.68 m OD
		28.4	-1.4	1.68	31	0 to 600

	Total Rigid Riser System	2708.2	552.5	-	208	4000

Source: Deep Reach Technology, Inc., 2015. Notes: RALS-1 = main riser pipe, lower section; RALS-2 = main riser pipe, middle section; RALS-3 = main riser pipe, upper section.

Table 13.7 Nominal airlift compressor specifications

Parameter	Main compressor		Booster compressor	Make-up compressor
	Peak production	Normal operation		
Mass flow of air (kg/s)	84	56	15.2	10.1
Volumetric flow of air (m^3/h at standard temperature and pressure)	252,000	168,000	45,544	30,207
Inlet pressure (kPa)	780	780	9,400	100
Outlet pressure (kPa)	8,460	9,430	15,000	800
Estimated power (MW)	26.0	18.1	0.74	2.4

Figure 13.15 Main air compressor (Elliott Group model 46M6I)



Source: Provided by Elliott Group.

Airlift was successfully tested in three deep-water pilot tests in the 1970s: two by the Ocean Mining Associates consortium, and one by Ocean Management Inc. There have also been several large terrestrial tests and at least one successful use of airlift for hoisting coal in a Soviet mine. Table 13.8 shows the main parameters of relevant airlift operations and tests for comparison with those proposed for this project.

The proposed airlift design discharges the 3-phase slurry under an 800 kPa pressure. The compressed air is dried and recycled in the compressors. This results in a reduced size of riser required at the discharge, and reduced compression ratio, compared to airlift systems with atmospheric discharge. It does require a specialize pressurized de-aeration tank and slurry depressurization on the production support vessel. Previous studies have shown that this approach results in a lower overall cost for the airlift system including the riser, but this conclusion needs to further be evaluated in the next study phase. The pressurized discharge has never been field tested, and the Collector Test is currently planned with one atmosphere discharge, hence large scale on-land testing of the pressurized discharge should be performed prior to its implementation on Project Zero or Project One.

Data from the KCON Tests (Doyle & Halkyard, 2007) have been used for validation of DRT's proprietary airlift simulation numerical model, which has been used for design of the airlift in this IA (Deep Reach Technology, Inc., 2019). The conclusion of this validation indicates the predicted flow rates were within ±10% for 3-phase flows (air-water-solids), and ±40% for 2-phase flows (air-water). DRT attributes the lower accuracy for 2-phase results to a difference in flow regimes, for example, slug flow for low air volumes, whereas the KCON model assumes froth flow (homogenous conditions). From observations made in the test work, particularly the KCON experiments, the presence of larger solids in the mixture results in breakup of air bubbles and a more stable froth flow. Although this data is based on smaller diameters and shorter lifts than the proposed deep ocean mining system, the experience with the Soviet mine is very close in terms of pipe diameters and flow rates, albeit for a shorter lift. Lift column tests have been completed and the air-lift system will be tested during the Collector Test.

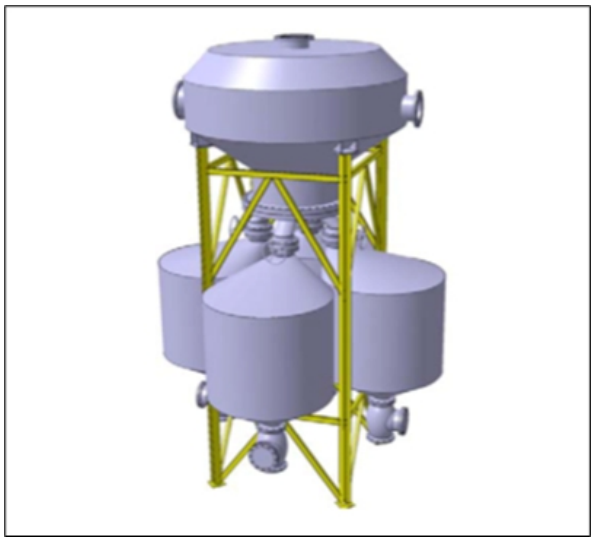
Table 13.8 Relevant airlift experience and tests

Reference	Vertical lift (m)	Pipe diameter (mm)	Lifting rate (tph)	Solids volumetric concentration (%)	Solids diameter (mm)
Collector Ship 1	4,400	679–870	1,600	16%	Up to 100
OMA, 1970, Blake Plateau Atlantic [LeCourt and Williams]	730	220	Unknown ("significant tonnages collected")	Unknown	Unknown
OMA, 1977, CCZ Pacific [Kaufman et al,1985]	4,400	160–240	0 to 75	20%	Up to 100
OMI, 1978 [Shaw, 1993] CCZ Pacific	5,200	200	30 (design)	unknown	Up to 100
KCON [Doyle & Halkyard, 2007] On-Land	30	305	Up to 400	0 to 44%	Up to 50
NRIPR, Japan [Saito et al, 1989] In Test Pit	200	151	Up to 96	0 to 15%	8–41
University of Karlsruhe Lab [Weber and Dedigel]	7.8	100	12	0 to 33%	
Mine shaft Rheinische Braunkohle AG [Weber and Dedigel]	441	300	115	0 to 8.6%	0.6–50 (Lignite)
Coal mine shaft Krasnoarmejsk-2, Donez Plateau (Ukraine), operated from 1966 to the 1970s [Heine, 1976]	460	400–1000	650	12–33%	15–25

The slurry from the RALS will pass through a diffuser to an airlift discharge system located on the deck of the PSV that will consist of a surge tank pressurised to 800 kPa and four lock hopper tanks operating in batch mode to reduce the pressure to atmospheric.

Figure 13.16 is an illustration of this design. The high-pressure discharge system will allow optimum efficiency for the airlift operation.

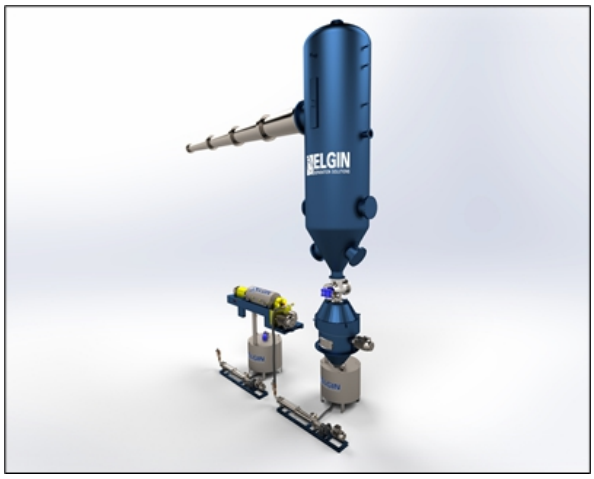
Figure 13.16 Nodule and air discharge concept



Source: Feenan 2009

The airlift discharge, or pressure let-down, system shown in Figure 13.16 is a batch system. An alternate continuous flow system has been proposed Figure 13.17 which is considered potentially a more reliable method.

Figure 13.17 Continuous Flow Pressure Let-down System shown with dewatering equipment (patent pending)



13.6.6 PSV operations

A Dynamic Positioning (DP) system will keep the PSVs on a specified track using only propellers or thrusters and without external moorings or other physical restraints. The DP control system will be linked to the collector tracks to control riser loads on the collectors. The DP system will be composed of the power supply from the PSV main power system, the thruster systems, and the DP-control system. DP is used by the off-shore oil industry in locations such as the North Sea, Persian Gulf, Gulf of Mexico, West Africa, and off the coast of Brazil. There are currently more than 1,800 DP ships across the globe.

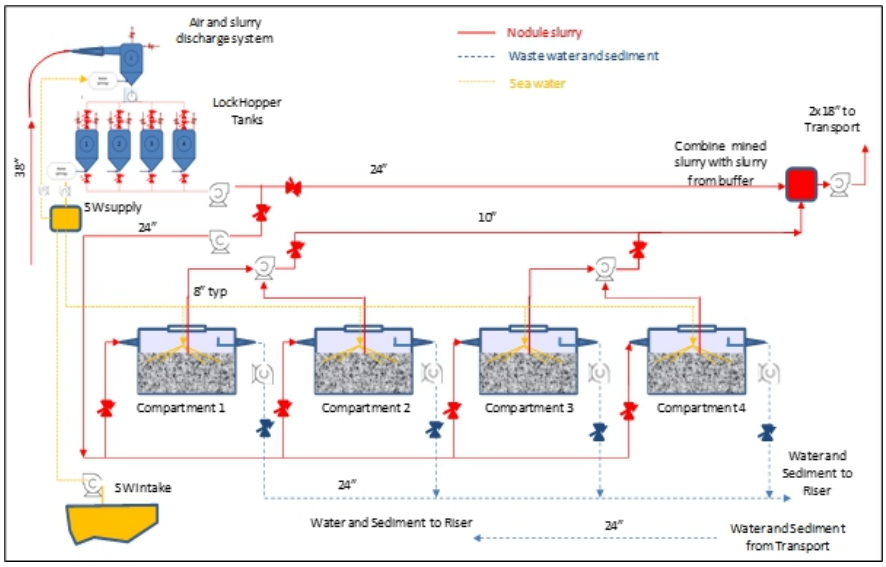
To accurately position the PSVs, a locating system will also be required. This will consist of a long baseline acoustic network set up with beacons spread out over the seabed and covering the site to be collected. The beacons will provide acoustic signals to each other and also the collectors, the bottom of the riser, and the PSV. The long baseline will also communicate with the differential GPS to ensure high precision geo-location for the system, at all times.

The same long baseline acoustic network for positioning the PSVs will be used to position the transport vessel, but likely enhanced with a telemetry system between the transport and the PSVs. The telemetry system will have functionality to execute disconnection of the transfer hoses, in the event of drive off or loss of power on either vessel.

If a transport vessel is connected to a PSV, the slurry from the RALS discharge system will be pumped directly to the transport vessel through floating hoses. The transport vessel, also dynamically positioned, will track in the wake of the PSV at about 100 m. Nodules will be dewatered by gravity settling in the holds of the transport vessel. Floating decanter weirs will recover the liquid containing water and sediment. This return water and sediment will be pumped back to the PSV through an additional floating hose to be returned to deep water via an auxiliary riser pipe that is part of the RALS.

If a transport vessel is not connected to a PSV, slurry from the discharge system will be pumped into buffer storage holds where it will also be dewatered by gravity settling.
Figure 13.18 is a schematic diagram of the airlift discharge and slurry handling system for Collector Ship 1. Figure 13.9 shows the equivalent system for the drillship cases. When the transport vessel is subsequently connected, the buffer storage will be liquefied using a jetting system, and the slurry from the buffer will be combined with the slurry from the discharge system to be pumped to the transport.

Figure 13.18 Schematic of buffer storage and material handling on Collector Ship 1



13.6.7 Collector support vessel

In Project One, in order to minimise the effect of collector maintenance on PSV operations, maintenance of the collectors deployed by Collector Ship 1 will be performed by a separate semi-submersible collector support vessel. Preliminary specifications of the CSV are listed in Table 13.9. The CSV will be similar to a subsea support platform such as the one shown in Figure 13.19.

When a collector requires repair, either planned or unplanned, it will be disconnected from the jumper hose and power umbilical (which connect it to the RALS) by ROV. The collector support vessel will maintain a spare collector that will be deployed by a wire line hoist to reconnect with the seafloor spread. The collector to be serviced will be hoisted to the deck of the collector support vessel. A preliminary deck plan for the collector support vessel is shown in Figure 13.20.

Table 13.9 Collector support vessel specifications

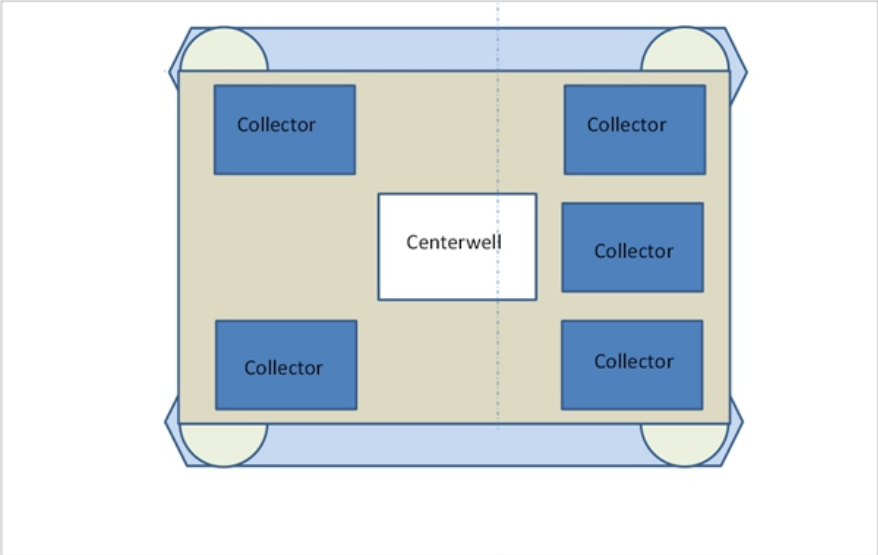
Parameters	Value
Draft	16 m
Column area	125 m^2
Column height	20 m
Column spacing (min)	50 m
Static air gap (freeboard)	10 m
Pontoon width	12.5 m^2
Pontoon height	5.65 m
Pontoon length	82.5 m
Deck length	80 m
Deck beam	50 m
Deck height	3.5 m
Displacement	17,250 t
Deadweight tonnage	9,750 t

Figure 13.19 Semi-submersible subsea oilwell support vessel, Q4000



Source: Helix Energy

Figure 13.20 Deck plan for collector support vessel

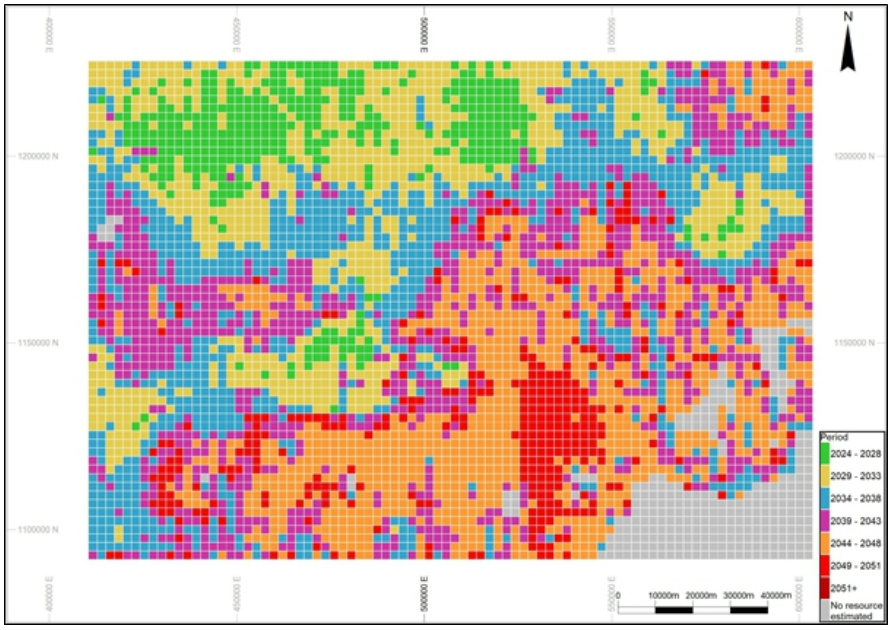


13.7 Life of Mine nodule production

13.7.1 Introduction

An assessment was conducted to prioritize the seafloor production, targeting areas of higher abundance. The assessment is not a detailed production plan but rather a conceptual plan of production increments linked to equipment operating schedules and the basis of design (BOD) production parameters. The mineral resource data has been adjusted using modifying factors and then accumulated into annual increments in accordance with the BOD parameters. The conceptual sequencing of production areas is summarized in Figure 13.21, showing the production blocks in five-year intervals over a life of mine (LOM) of over 27 years.

Figure 13.21 NORI 30-year potential production areas



13.7.2 LOM basis of design

The nominal design parameters for the PSVs and their seafloor collector systems are summarized in Table 13.10 and Table 13.11. The tables distinguish between years in which the vessels dry dock and non-dry dock years. Every five years the production vessels
(and collector support vessel in the case of Collector Ship 1) are required to dry-dock for Class special survey. Collector and riser replacement would also be conducted during this period. An allowance of 60 days is included for this based on experience with dry dockings for South African diamond mining vessels. Project Zero only operates for five years, so no allowance is required for dry docking the Hidden Gem. After five years, the Hidden Gem is upgraded.

Two utilization (operating days per year) values are tabulated. The nominal values assume 20 days downtime per year for manoeuvring. The “Utilization excluding manoeuvring” value is used below is estimating LOM production rates wherein a specific turning allowance is calculated for each year.

The BOD for the seafloor production systems is summarized in Table 13.12 to Table 13.14.

Table 13.10 Nominal engineering parameters for Hidden Gem and Drill Ship 2

Hidden Gem/Drill Ship 2 (no spare collector)	**Pre-2030**	**Post 2030**		
		Average	**Dry dock Year**	**No dry dock**
Dockings & scheduled outages (days)	0	12	60	0
Area moves	10	10	10	10
Available time at sea (days)	355	343	295	355
Collector mean time between repair (days)	14	14	14	14
Collector mean time to repair (days)	2	2	2	2
Planned maintenance, % (collector)	13%	13%	13%	13%
Planned maintenance, % (other)	5%	5%	5%	5%
Engineering downtime (days)	62	60	52	62
Engineering availability (%)	83%	83%	83%	83%
Engineering availability (days)	293	283	243	293
Other work (days)	10	10	10	10
Weather delays (days)	15	15	15	15
Process/transport delays (days)	10	10	10	10
Allowance for manoeuvring	20	20	20	20
Nominal utilization (%)	67%	66%	64%	67%
Nominal utilization (operating days per year)	238	228	188	238
Utilization excluding manoeuvring	258	248	208	258
Collector effective width (m)	8.7	12	12	12
Number of collectors (operating)	1	2	2	2

Table 13.11 Nominal engineering parameters - Collector Ship 1

Collector Ship 1 (Collector Support Vessel and spare collector)	**Average**	**Dry dock Year**	**No dry dock**
Dockings & scheduled outages (days)	12	60	0
Area moves	10	10	10
Available time at sea (days)	343	295	355
Collector mean time between repair (days)	30	30	30
Collector mean time to repair (days)	0.4	0.4	0.4
Planned maintenance, % (collector)	1%	1%	1%
Planned maintenance, % (other)	5%	5%	5%
Engineering downtime (days)	22	19	22
Engineering availability (%)	94%	94%	94%
Engineering availability (days)	321	276	333
Other work (days)	10	10	10
Weather delays (days)	15	15	15
Process/transport delays (days)	10	10	10
Allowance for manoeuvring	20	20	20
Nominal utilization (%)	78%	75%	78%
Nominal utilization (operating days per year)	266	221	278
Utilization excluding manoeuvring	286	241	298
Collector effective width (m)	12	12	12
Number of collectors (operating)	4	4	4

Table 13.12 Seafloor production basis of design – Hidden Gem

Hidden Gem	Unit	Value
No dry dock years, four years continuous	days	238
Dry dock years, every fifth year	days	190
Average utilization (days per year)	days	229
Collector head width pre 2030	m	8.7
Collector head width post 2030	m	12
Collector speed	m/sec	0.5
Number of collectors pre 2030	Unit	1
Number of collectors post 2030	Unit	2
Pumping design rate set to average abundance	kg/m^2	20

Table 13.13 Seafloor production basis of design – Drill Ship 2

Drill Ship 2	Unit	Value
No dry dock years, four years continuous	days	238
Dry dock years, every fifth year	days	190
Average utilization (days per year)	days	229
Collector head width	m	12
Collector speed (maximum)	m/sec	0.5
Number of collectors	Unit	2
Pumping design rate set to average abundance	kg/m^2	20

Table 13.14 Seafloor production basis of design - Collector Ship 1

Collector Ship 1	Unit	Value
No dry dock years, four years continuous	days	278
Dry dock years, every fifth year	days	222
Average utilization (days per year)	days	267
Collector path Width	m	12
Collector speed (maximum)	m/sec	0.5
Number of collectors	Unit	2
Number of collectors 2026	Unit	2
Number of collectors 2027	Unit	3
Number of collectors 2028	Unit	4
Pumping design rate set to average abundance	kg/m^2	20

Turning of the PSV, collector vehicles and RALS has not yet been extensively investigated but will be assessed during the proposed Collector Test. Analysis of a towed system in the 1970s indicated a turn radius of greater than 1,000 m (KCON Feasibility report, 1976). For this IA, a self-propelled turn with a radius of 500 m has been assumed Table 13.15. It has also been conservatively assumed that no nodules will be collected during the turns.

Table 13.15 Collector system turning parameters basis of design

	Units	Value
Turning interval assuming 180˚input	m	30,000
Seafloor collector availability		100%
Collector turning radius	m	500
Time to establish turn	h	0.25
Time to make 180˚turn	h	1.11
Total time to complete turn	h	1.36

Figure 13.22 shows the conceptual arrangement of collection paths. The path is developed as follows:

1) Collection path No 1 proceeds in a west to east direction.

2) Collection path No 2 is accessed by a 180˚ south turn and then proceeds in an east to west direction.

3) Collection path No 3 is accessed by a 180˚ north turn and then proceeds in a west to east direction with a 1.0 m offset from the edge of path No.1.

4) Collection path No 4 is accessed by a 180˚ south turn and then proceeds in an east to west direction with a 1.0 m offset from the edge of path No.2.

5) The extraction sequence progress in a southwards direction until the collection panel is completely traversed.

6) At this point the PSV, RALS, and collectors are relocated to the adjacent panel to the south and the sequence 1 to 5 is repeated.

Collector location will be guided by an array of long baseline (LBL) beacons on the seafloor. On completion of a rectangular panel, the equipment would repeat the operation in an adjacent panel.

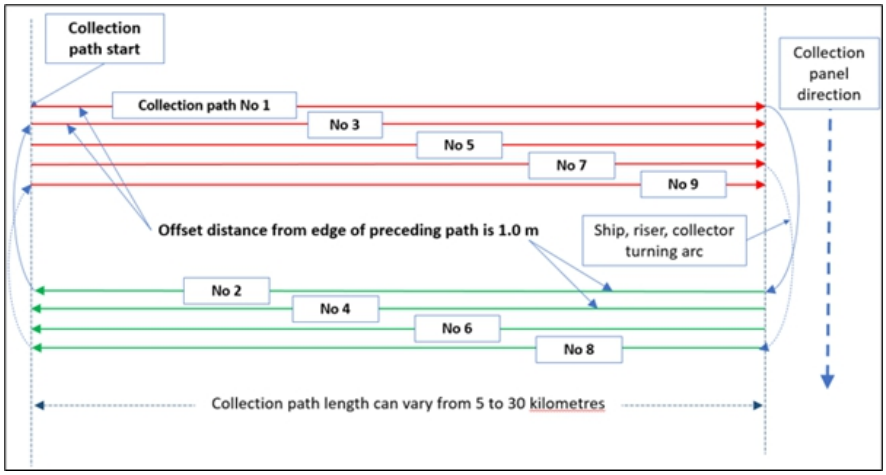
Further studies will be required to optimise the collector paths and their orientation. The Collector Test is expected to provide essential information to inform these studies.

The annual production rate of each collector is a function of average nodule abundance (A), collector width (B), speed (C), number of days per year availability (D), and nodule recovery (E). The relationship is expressed by the following formula:

$$\text{Individual collector production rate (F)} = A \cdot B \cdot C \cdot D \cdot 24 \cdot E$$

A maximum velocity of 0.5 m/sec was assumed for the collector (DRT, 2015). Recovery includes factors to account for nodules that fail to be picked up (collector efficiency), nodules lost in the concentration process on the collector, and fine nodule material that is lost in the dewatering process on board the PSV and transport vessels (dewatering efficiency).

Figure 13.22 Conceptual nodule collection path sequencing



The mining system is designed to operate at a constant speed. Short scale variations in abundance on the seafloor will result in fluctuations in the flow through the collector and RALS. This is accounted for by designing for peak production of twice the average for the collector and 1.3 times the average for the lift system, taking into account the averaging times (nodule residence times) for these systems. This additional short-term capacity avoids the need to continually vary the speed of the collector.

The collecting operation is assumed to work 264 days per year. Estimates of annual availability of the production system were derived from an assessment of weather and mechanical downtime which indicated that 267 days could be expected.

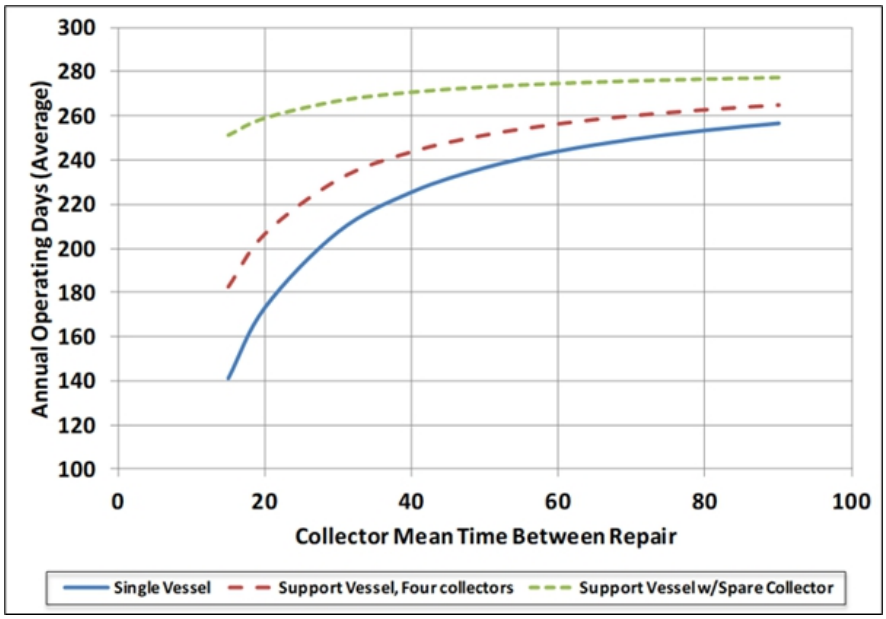
Current experience with off-shore drilling and production suggests an uptime between 95 - 98% is possible with well-designed equipment, adequate redundancy, and planned maintenance. One of the most important factors for the deep-sea extraction project is the reliability and maintainability of the collectors themselves. The mean time between repairs, or service, of the collectors is uncertain until actual operations begin.

In order to mitigate the effect of this uncertainty, the collector change-out method described in Figure 13.13, has been adopted to minimise the time required to replace a collector for maintenance. It is estimated that the swap-out operation on Collector Ship 1 could be performed in as little as 12 hours. Figure 13.23 shows the effect of collector mean time between repair on overall utilisation based on this maintenance concept compared with other concepts for repair that do not involve spare collector swap out.

For this IA, the mean time between repair is assumed to be 30 days. Note that in comparison with the other strategies for collector repair shown in Figure 13.23, the total annual operating days for the proposed method is less sensitive to the mean time between repair. Crawler vehicles used for subsea diamond mining are typically recovered every 5–7 days for planned maintenance. The reason for such frequent maintenance of these vehicles is leakage of seals on hydraulic cylinders used for raising and lowering a large boom with a cutting head. The nodule collectors will not require any hydraulic cylinders.

Pilot test collectors in the 1970s succeeded in operating continuously up to about four days.

Figure 13.23 Impact of collector mean time between repair on overall utilisation - Collector Ship 1



Aside from failures of lift pumps, collector failure was typically due to leakage of an oil filled electric motor (Shaw, 1993). This technology has subsequently been superseded by the advent of subsea water-cooled electric motors, which have recently been implemented in the subsea oil and gas industry and are achieving multiple years of life without maintenance (Millward, 2008). Reliability can now be greatly improved by employing direct electric drives, using water-cooled motors, for pumps and tracks instead of hydraulic power. Other measures to improve reliability include implementation of 100% redundancy for critical components such as suction pumps and instrumentation.

The overall nodule recovery efficiency is estimated at 80%. The recovery value is based upon test work conducted in the 1970s. Nodule recovery efficiency is the product of nodule entrainment efficiency, subsea concentrator recovery, and dewatering system efficiency. The estimate of dewatering recovery used in this IA is higher than indicated by the 1970s test work because data that has come to light recently suggests the amount of breakup during lifting the nodules up the RALS may be significantly less than previously assumed (Kennecott (1978), DRT (2015)).

The modifying factors applied to the mineral resource to estimate production tonnages are detailed in Table 13.16.

Table 13.16 Mineral Resource modifying factors

Modifying factors	Value	Description
Resource area efficiency	92%	The resource area efficiency factor is defined as the width of the collector divided by the width of the collector path. A 0.5 m undisturbed strip is to be left either side of the collector. For a 12 m wide collector, the resource area efficiency is calculated as 12 / 13.
Collector pick-up efficiency	90%	This is the percentage of nodule mass passed over by the collector that is pickup up by the collector head. Reference Table 6 Recovery efficiencies assumed for this study, DRT-1412-RP-02-R02: Seafloor Polymetallic Nodule Off-shore Scoping Study - Technical Report.
Collector underflow efficiency	95%	This is percentage of nodule mass that is pickup up that is passed to the collector underflow. Reference Deep Green Material Balance Summary, Preliminary for information only Thursday, November 28, 2020 (Collector nodule mass underflow/ Collector nodule mass picked up, 435.7/458.6).
Nodule attrition	0%	This is the percentage of mass of nodule lost through attrition from the sea floor to trans-shipment. It is included in the trans-shipment efficiency.
Trans-shipment efficiency	93%	This is the percentage of nodule mass transferred from the production vessel to trans-shipment. Reference Deep Green Material Balance Summary, Preliminary for information only Thursday, November 28, 2020. (Transport fill/ (Buffer fill + Buffer discharge), 508.8/ (435.7+129.6).
Overall collector efficiency	80%	This is the percentage of nodule mass passed over by the collector that is delivered to the transport vessel. It includes losses in the pick-up, overflow, attrition and trans-shipment (90%*95%*100%*93%).
Overall resource recovery factor	73%	Is the product of the resource area efficiency * collector pick-up efficiency * collector under flow efficiency * (1 - nodule attrition (%)), * trans-shipment efficiency (92%*90%*95%*100%*93%).

The resource accumulation excludes parts of each block that are considered not suitable for production, such as areas with volcanic rocks or where the sea floor slope is too steep. The collector was designed with a maximum operating slope of 8˚ but the Mineral Resource and production plan are based on a more conservative 6˚ limit.

The resource area efficiency factor includes a 0.5 m undisturbed strip either side of the collector path and encompasses an allowance for the collector turning zone at the end of each strip. The efficiency of the collector in the turning circle in unknown at this stage and nodules may be partially or non-recoverable. The 0.5 m strip either side of the collector is an allowance for inaccuracy in steering the collector. The proposed Collector Test is expected to provide valuable information on location control. The collectors will be turned at predefined points to avoid volcanic rocks, slopes greater than 6˚ and at the end of collection paths. The ability to recover nodules effectively in an area previously traversed and disturbed by turning needs to be evaluated. An estimate of 92% efficiency is considered reasonable for this high-level assessment.

Collector pick up efficiency of 90% was assumed, based on trials by the Kennecott consortium in 1976 (Kennecott Exploration Inc., 1976) and preliminary tank tests. The collector underflow efficiency of 95% accounts for the nodule mass that is to be pumped to the riser and nodule loss of 5% to the collector overflow. The collector overflow and nodule loss are ejected at the sea floor.

The mechanism of collecting and pumping of the nodules from the sea floor, through the airlift riser, to the surface vessel will cause nodules to collide with the collector system, riser walls and with other nodules. These collisions will result in attrition which will cause some reduction in the nodule particle size. The nodules that report to the surface production vessel will be dewatered and depressurized prior to trans-shipment transfer to a transport vessel. During this process, nodule mass loss of 7% has been estimated, including the fine products of attrition in the riser. Lost nodules report to the dewatering discard flow.

The LOM incorporates the following parameters and processes:

- Block size selection was estimated to align with approximate one-week nodule production of 0.1 Mt. The block size is 2,300 m by 2,300 m with data being consolidated from the geological model, as is detailed in Figure 13.21.
- The following parameters (label, units) were accumulated into the LOM data set:
  - Nodule abundance (kg/m^2).
  - Nodule grades (%): Ni, Cu, Co, Mn, Si, Fe, P.
  - Manganese oxide silicon dioxide ratio.
  - Proportion of area covered by nodule domain (Nodule %).
  - Proportion of area covered by slopes greater than 6˚.
  - Proportion of area covered by volcanic rocks.
  - Block designation by 5-year period (first 35 years).
- The following parameters were calculated and used in the LOM:
  - In situ nodule resource tonnes were calculated from the block area, nodule abundance and nodule area percentage.
  - Available nodule tonnes were calculated from the in situ nodule resources and the resource area efficiency factor and accumulated by 5-year periods.
  - Product tonnes were calculated from the available nodule tonnes, collector pick up efficiency factor, collector under flow efficiency factor, nodule attrition factor, and the trans-shipment efficiency factor.
  - Cumulative manganese oxide silicon dioxide ratio was determined from the weighted average block manganese oxide silicon dioxide ratios.
  - Travel distance for one collector was calculated from the block area, percentage nodule area, collector width and allows for the strip left in situ.
  - Pumping modifying factor was calculated to lower the travel speed of the collector when the nodule abundance is larger than the pumping maximum design rate. The pumping adjustment factor was used in determining the overall operated hours by multiplying the block time (travel distance / collector speed).
  - Collector operating hours were determined by:
    - Collector traverse distance divided by the average collector travel speed as defined in the BOD.
    - Additional time was estimated to take account of the turns required, as defined by the collection path. At this level of analysis there is no detailed collection path, hence an allowance was made for the number of turns and total time to complete a turn, as per the BOD. The number of turns per block was estimated by dividing the collector travel distance by the ship turning interval of 30,000 m. Figure 16-31, Figure 16-32 and Figure 16-33 details the LOM collector speeds and nodule abundance.
    - The collector operating time is for a single collector only and these hours were then multiplied by the number of collectors, as defined in BOD.

– The pumping adjustment factor was used in determining the overall operated hours by multiplying this factor by the block time (travel distance / collector speed).

13.7.3 LOM production summary

The LOM production sequence aims to maximize nodule production. It is a conceptual sequence based on mining the areas with the highest abundance first. Production blocks in each nominal 5-year production zone were ranked by abundance. The production sequence accumulates tonnage progressively down through the ranked blocks. Detailed collection paths for the PSVs and seafloor production systems were not developed nor was the production sequence optimized. The production blocks in the sequence are not necessarily spatially contiguous. Twenty (20) days were allowed in the LOM production summary for relocation between non-contiguous blocks. This approach would need to be evaluated through a rigorous mine design and optimization process.

The production summaries for the Hidden Gem, Drill Ship 2 and Collector Ship 1 are provided respectively in Table 13.17, Table 13.18, and Table 13.19. The consolidated LOM production is summarized in Table 13.18 and

Figure 13.24. Over the period 2024 to 2046 a total of 254 Mt is produced with annual production ranging from 0.96 Mt in 2024 to maximum of 14.32 Mt in 2031.

Figure 13.24 NORI Area D LOM production summary

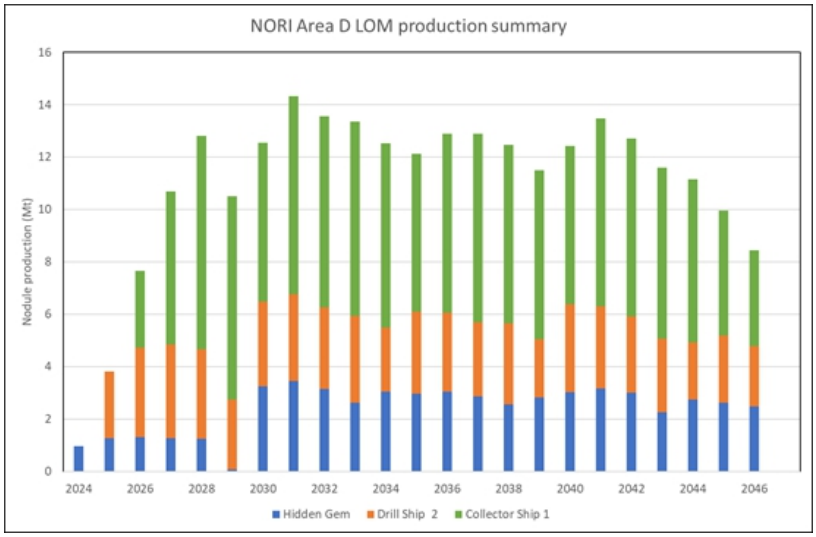


Table 13.17 Hidden Gem summary

Hidden Gem		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Nodule Tonnage	Mt	0.96	1.26	1.31	1.27	1.25	0.07	3.25	3.44	3.14	2.63	3.05	2.96
Abundance	kg/m2	21.22	20.78	20.24	19.56	19.00	18.65	17.95	18.80	17.40	18.06	16.86	16.23
Ni Grade	%	1.39	1.40	1.40	1.40	1.38	1.43	1.40	1.39	1.40	1.39	1.40	1.40
Cu Grade	%	1.16	1.15	1.15	1.14	1.12	1.20	1.16	1.13	1.16	1.15	1.15	1.14
Co Grade	%	0.14	0.15	0.15	0.15	0.15	0.13	0.13	0.15	0.13	0.14	0.13	0.13
Mn Grade	%	31.49	31.54	31.47	31.06	30.86	31.46	31.41	31.05	31.29	31.22	31.18	31.23
Si Grade	%	5.58	5.48	5.45	5.58	5.81	5.56	5.34	5.68	5.38	5.51	5.39	5.41
Fe Grade	%	6.32	6.40	6.52	6.65	6.73	6.03	6.67	6.67	6.69	6.69	6.88	6.98
P Grade	%	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.15	0.16	0.16	0.16
MnO_SiO2	Ratio	3.42	3.48	3.50	3.37	3.24	3.42	3.56	3.33	3.52	3.44	3.51	3.49
Overall collector speed	(m/sec)	0.47	0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Annual operated hours	h	3,974	5,218	5,431	5,401	5,461	118	5,628	5,687	5,602	4,537	5,621	5,655
Travel distance	km	6,676	8,938	9,537	9,589	9,697	209	9,994	10,097	9,947	8,045	9,981	10,041
Ship Turns		211	283	302	304	307	7	317	320	315	255	316	318
Block sector		1	1	1	1	1	2	2	3	3	3&4	4	4

Hidden Gem		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	Total
Nodule Tonnage	Mt	3.05	2.85	2.56	2.82	3.03	3.16	3.00	2.25	2.74	2.61	2.48	**55.1**
Abundance	kg/m2	16.88	15.75	17.45	15.38	16.60	17.34	16.36	15.58	15.02	14.42	13.59	**16.93**
Ni Grade	%	1.39	1.40	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.37	1.38	**1.39**
Cu Grade	%	1.16	1.13	1.14	1.13	1.14	1.14	1.13	1.12	1.13	1.13	1.12	**1.14**
Co Grade	%	0.13	0.13	0.14	0.13	0.13	0.14	0.14	0.14	0.13	0.12	0.13	**0.14**
Mn Grade	%	31.05	31.08	30.80	30.94	30.93	30.64	30.75	30.69	30.56	30.80	30.74	**31.01**
Si Grade	%	5.51	5.48	5.62	5.56	5.63	5.73	5.63	5.65	5.71	5.65	5.64	**5.56**
Fe Grade	%	6.78	7.05	6.84	7.07	6.86	6.87	6.99	7.14	7.18	7.03	7.11	**6.86**
P Grade	%	0.15	0.16	0.16	0.16	0.17	0.16	0.16	0.16	0.17	0.19	0.17	**0.16**
MnO_SiO2	Ratio	3.42	3.43	3.34	3.37	3.33	3.28	3.34	3.32	3.27	3.30	3.31	**3.39**
Overall collector speed	(m/sec)	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	**0.49**
Annual operated hours	h	5,605	5,629	4,555	5,685	5,641	5,660	5,698	4,495	5,674	5,629	5,671	**118,276**
Travel distance	km	9,952	9,995	8,088	10,094	10,016	10,050	10,116	7,982	10,074	9,995	10,070	**209,186**
Ship Turns		315	317	256	320	317	318	320	253	319	317	319	**6,626**
Block sector		5	5	6	6	6&7	7	7	7	7	7	7	

Note: Hidden Gem is upgraded in 2029

Table 13.18 Drill Ship 2 summary

Drill Ship 2		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Nodule Tonnage	Mt		2.56	3.41	3.57	3.41	2.67	3.23	3.32	3.13	3.30	2.43	3.14
Abundance	kg/m2		20.49	19.99	19.45	18.81	18.51	17.81	18.19	17.27	18.10	16.65	17.24
Ni Grade	%		1.40	1.40	1.41	1.40	1.40	1.40	1.40	1.40	1.40	1.39	1.40
Cu Grade	%		1.14	1.15	1.13	1.14	1.15	1.15	1.14	1.15	1.14	1.16	1.13
Co Grade	%		0.15	0.15	0.15	0.14	0.14	0.13	0.14	0.13	0.14	0.13	0.14
Mn Grade	%		31.49	31.53	31.35	31.26	31.29	31.40	31.23	31.29	30.97	31.29	30.95
Si Grade	%		5.45	5.40	5.49	5.55	5.49	5.30	5.40	5.39	5.55	5.39	5.60
Fe Grade	%		6.56	6.54	6.68	6.63	6.62	6.77	6.71	6.81	6.76	6.74	6.93
P Grade	%		0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.15	0.16
MnO_SiO2	Ratio		3.50	3.54	3.46	3.43	3.47	3.58	3.51	3.51	3.40	3.51	3.36
Overall collector speed	(m/sec)		0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Annual operated hours	h		3,970	5,316	5,704	5,636	4,481	5,634	5,665	5,629	5,664	4,535	5,655
Travel distance	km		6,890	9,422	10,128	10,008	7,956	10,004	10,058	9,994	10,057	8,053	10,039
Ship Turns			218	298	321	317	252	317	319	317	319	255	318
Block sector			1	1	1	1	2	2	3	3	4	4	4&5

Drill Ship 2		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	Total
Nodule Tonnage	Mt	3.00	2.84	3.09	2.23	3.35	3.14	2.92	2.82	2.17	2.58	2.30	**64.6**
Abundance	kg/m2	16.37	15.59	16.90	15.26	18.24	17.13	16.15	15.44	14.88	14.28	12.65	**17.23**
Ni Grade	%	1.40	1.40	1.39	1.40	1.39	1.39	1.39	1.39	1.39	1.38	1.38	**1.40**
Cu Grade	%	1.14	1.13	1.15	1.13	1.14	1.13	1.13	1.12	1.13	1.13	1.13	**1.14**
Co Grade	%	0.14	0.13	0.14	0.13	0.14	0.14	0.14	0.14	0.13	0.13	0.13	**0.14**
Mn Grade	%	31.03	31.10	30.94	30.99	30.60	30.60	30.67	30.75	30.76	30.95	30.82	**31.07**
Si Grade	%	5.45	5.49	5.61	5.53	5.83	5.72	5.68	5.66	5.63	5.59	5.61	**5.54**
Fe Grade	%	6.95	7.07	6.82	7.11	6.76	6.90	7.00	7.04	7.11	7.00	7.05	**6.83**
P Grade	%	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.18	0.17	**0.16**
MnO_SiO2	Ratio	3.45	3.43	3.36	3.39	3.20	3.28	3.30	3.32	3.33	3.35	3.34	**3.41**
Overall collector speed	(m/sec)	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	**0.49**
Annual operated hours	h	5,694	5,653	5,674	4,530	5,707	5,698	5,617	5,667	4,538	5,610	5,638	**117,916**
Travel distance	km	10,109	10,037	10,074	8,044	10,133	10,118	9,973	10,063	8,057	9,962	10,011	**209,191**
Ship Turns		320	318	319	255	321	320	316	319	255	316	317	**6,626**
Block sector		5	5	6	6	7	7	7	7	7	7	7	

Table 13.19 Collector Ship 1 summary

Collector Ship 1		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Nodule Tonnage	Mt			2.94	5.84	8.15	7.76	6.06	7.56	7.30	7.43	7.05	6.03
Abundance	kg/m2			19.71	19.20	19.08	18.19	17.70	17.70	17.01	17.39	16.45	17.71
Ni Grade	%			1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.39
Cu Grade	%			1.14	1.14	1.13	1.15	1.16	1.15	1.16	1.15	1.15	1.14
Co Grade	%			0.15	0.15	0.15	0.13	0.13	0.14	0.13	0.14	0.13	0.14
Mn Grade	%			31.42	31.36	31.17	31.48	31.23	31.25	31.31	31.14	31.18	30.97
Si Grade	%			5.51	5.48	5.57	5.35	5.39	5.41	5.38	5.47	5.44	5.60
Fe Grade	%			6.61	6.64	6.70	6.61	6.72	6.71	6.77	6.77	6.85	6.76
P Grade	%			0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16
MnO_SiO2	Ratio			3.46	3.47	3.40	3.57	3.50	3.50	3.52	3.46	3.47	3.37
Overall collector speed	(m/sec)			0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Annual operated hours	h			4,633	6,297	6,642	6,626	5,321	6,635	6,662	6,641	6,657	5,284
Travel distance	km			8,226	11,181	11,783	11,765	9,447	11,781	11,828	11,792	11,819	9,382
Ship Turns				261	354	373	373	299	373	375	374	374	297
Block sector				1	1	1&2	2	2&3	3	3	4	4	5

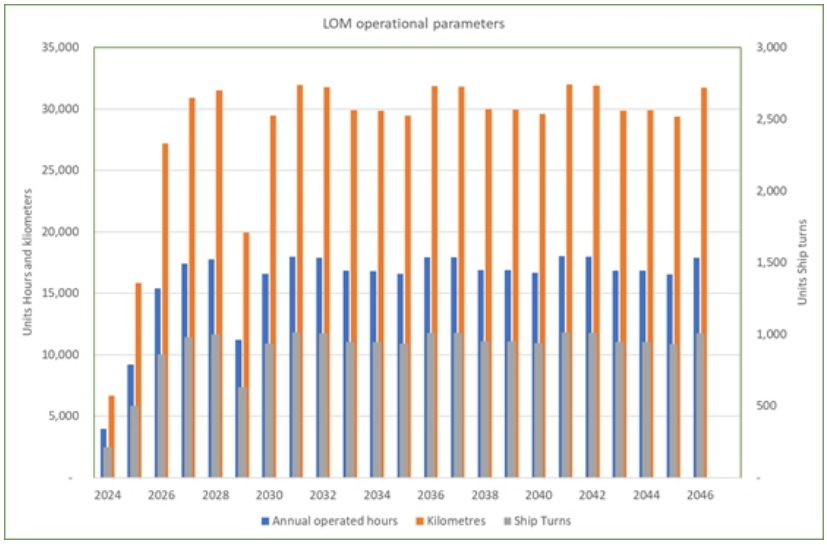
Collector Ship 1		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	Total
Nodule Tonnage	Mt	6.85	7.20	6.82	6.45	6.04	7.17	6.79	6.53	6.24	4.77	3.66	**134.6**
Abundance	kg/m2	15.99	16.83	15.93	15.05	17.67	16.75	15.84	15.23	14.64	14.01	8.56	**16.67**
Ni Grade	%	1.40	1.39	1.40	1.39	1.39	1.39	1.39	1.39	1.38	1.37	1.38	**1.39**
Cu Grade	%	1.14	1.13	1.14	1.14	1.13	1.14	1.12	1.13	1.13	1.11	1.13	**1.14**
Co Grade	%	0.13	0.14	0.13	0.13	0.14	0.14	0.14	0.13	0.12	0.12	0.13	**0.14**
Mn Grade	%	31.14	31.00	31.00	30.97	30.63	30.67	30.74	30.70	30.88	30.37	30.74	**31.03**
Si Grade	%	5.46	5.59	5.50	5.55	5.73	5.68	5.61	5.64	5.60	5.79	5.64	**5.53**
Fe Grade	%	6.96	6.91	7.01	7.08	6.84	6.93	7.08	7.12	7.03	7.19	7.05	**6.87**
P Grade	%	0.16	0.16	0.16	0.17	0.16	0.16	0.16	0.16	0.18	0.18	0.17	**0.16**
MnO_SiO2	Ratio	3.46	3.38	3.42	3.38	3.27	3.31	3.35	3.32	3.35	3.19	3.32	**3.41**
Overall collector speed	(m/sec)	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	**0.49**
Annual operated hours	h	6,650	6,644	6,644	6,656	5,307	6,649	6,656	6,656	6,616	5,291	6,559	**131,726**
Travel distance	km	11,807	11,797	11,798	11,818	9,423	11,806	11,817	11,818	11,747	9,395	11,645	**233,877**
Ship Turns		374	374	374	374	298	374	374	374	372	298	369	**7,408**
Block sector		5	5&6	6	6	7	7	7	7	7	7	7	

Table 13.20 NORI Area D production summary

Combined Summary		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Nodule Tonnage	Mt	0.96	3.82	7.66	10.68	12.81	10.50	12.55	14.32	13.57	13.36	12.53	12.13
Abundance	kg/m2	21.22	20.58	19.93	19.33	19.00	18.28	17.79	18.08	17.16	17.70	16.59	17.23
Ni Grade	%	1.39	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Cu Grade	%	1.16	1.15	1.14	1.14	1.13	1.15	1.15	1.14	1.16	1.15	1.15	1.14
Co Grade	%	0.14	0.15	0.15	0.15	0.15	0.13	0.13	0.14	0.13	0.14	0.13	0.14
Mn Grade	%	31.49	31.50	31.47	31.33	31.16	31.43	31.32	31.20	31.30	31.11	31.20	31.03
Si Grade	%	5.58	5.46	5.45	5.49	5.59	5.38	5.35	5.47	5.38	5.50	5.42	5.55
Fe Grade	%	6.32	6.51	6.56	6.65	6.69	6.61	6.72	6.70	6.76	6.75	6.84	6.86
P Grade	%	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16
MnO_SiO2	Ratio	3.42	3.50	3.50	3.46	3.39	3.54	3.54	3.46	3.52	3.44	3.49	3.40
Overall collector speed	(m/sec)	0.47	0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Annual operated hours	h	3,974	9,188	15,379	17,402	17,740	11,225	16,584	17,986	17,893	16,842	16,813	16,594
Travel distance	km	6,676	15,828	27,185	30,898	31,488	19,930	29,445	31,936	31,770	29,894	29,853	29,462
Ship Turns		211	501	861	979	997	631	933	1,012	1,006	947	946	933
Block sector		HG=1 DS= CS=	HG=1 DS=1 CS=	HG=1 DS=1 CS=1	HG=1 DS=1 CS=1	HG=1 DS=1 CS=1&2	HG=2 DS=2 CS=2	HG=2 DS=2 CS=2&3	HG=3 DS=3 CS=3	HG=3 DS=3 CS=3	HG=3&4 DS=4 CS=4	HG=4 DS=4 CS=4	HG=4 DS=4&5 CS=5

Combined Summary		2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	Total
Nodule Tonnage	Mt	12.90	12.89	12.47	11.49	12.42	13.48	12.71	11.60	11.15	9.97	8.43	**254.4**
Abundance	kg/m2	16.29	16.32	16.48	15.17	17.56	16.98	16.03	15.35	14.78	14.19	11.15	**16.87**
Ni Grade	%	1.40	1.40	1.39	1.39	1.39	1.39	1.39	1.39	1.38	1.37	1.38	**1.39**
Cu Grade	%	1.14	1.13	1.14	1.13	1.13	1.14	1.13	1.12	1.13	1.12	1.13	**1.14**
Co Grade	%	0.13	0.14	0.14	0.13	0.14	0.14	0.14	0.13	0.13	0.12	0.13	**0.14**
Mn Grade	%	31.09	31.04	30.94	30.97	30.70	30.65	30.72	30.71	30.78	30.63	30.76	**31.03**
Si Grade	%	5.47	5.54	5.55	5.55	5.73	5.70	5.63	5.65	5.63	5.70	5.63	**5.54**
Fe Grade	%	6.92	6.98	6.93	7.08	6.82	6.91	7.04	7.10	7.08	7.10	7.07	**6.86**
P Grade	%	0.16	0.16	0.16	0.17	0.16	0.16	0.16	0.16	0.17	0.18	0.17	**0.16**
MnO_SiO2	Ratio	3.45	3.40	3.39	3.38	3.27	3.29	3.34	3.32	3.32	3.26	3.32	**3.41**
Overall collector speed	(m/sec)	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	**0.49**
Annual operated hours	h	17,948	17,927	16,874	16,871	16,655	18,008	17,970	16,819	16,828	16,531	17,868	**367,917**
Travel distance	km	31,868	31,830	29,960	29,956	29,571	31,974	31,907	29,863	29,879	29,353	31,726	**652,253**
Ship Turns		1,009	1,008	949	949	937	1,013	1,011	946	946	930	1,005	**20,660**
Block sector		HG=5 DS=5 CS=5	HG=5 DS=5 CS=5&6	HG=6 DS=6 CS=6	HG=6 DS=6 CS=6	HG=6&7 DS=7 CS=7	HG=7 DS=7 CS=7	HG=7 DS=7 CS=7	HG=7 DS=7 CS=7	HG=7 DS=7 CS=7	HG=7 DS=7 CS=7	HG=7 DS=7 CS=7	

Figure 13.25 LOM operational parameters



The LOM grades and manganese oxide silicon dioxide ratio are detailed in Table 13.20 and depicted in Figure 13.26 and Figure 13.27. All are relatively constant across the LOM period.

Figure 13.26 Variation in grades of nickel, copper, cobalt and phosphorus across LOM

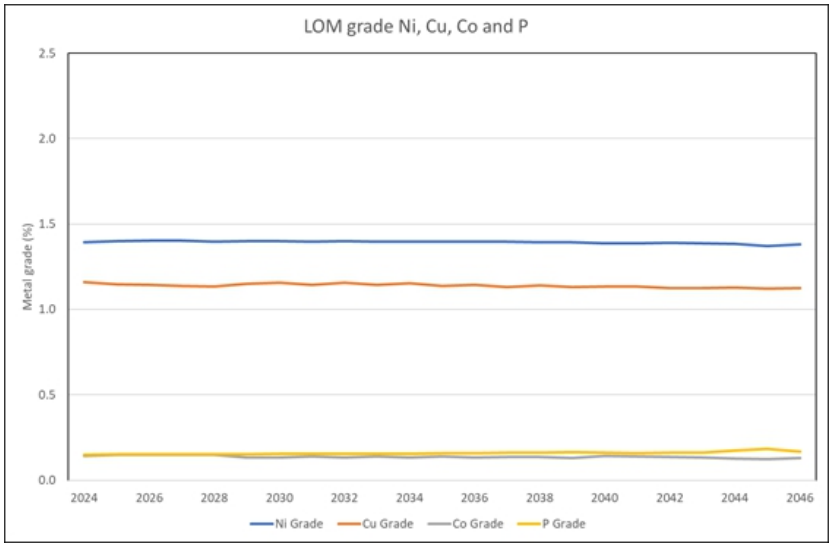


Figure 13.27 Variation in grades of manganese, iron, silicon and MnO:SiO_2 ratio across LOM

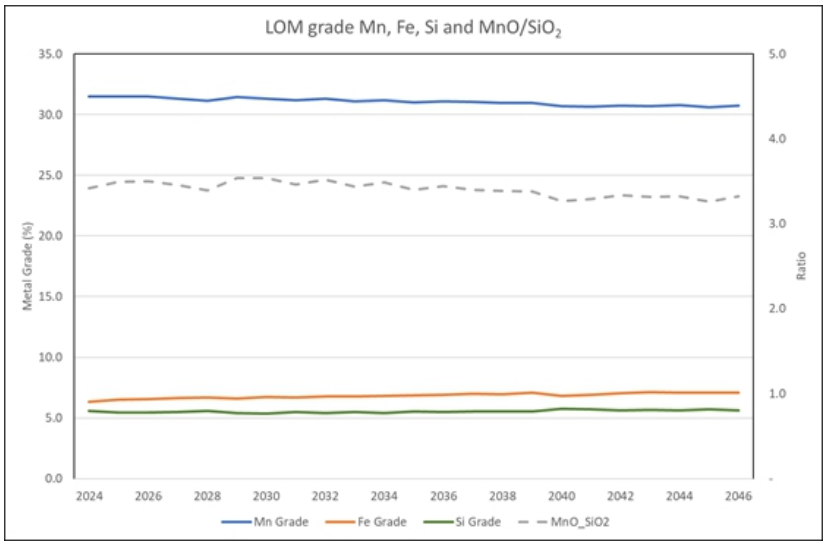


Figure 13.28 details the cumulative nodule product and cumulative abundance and

Figure 13.29 shows the nodule product tonnages divided into abundance classes.

Figure 13.28 Cumulative LOM nodule production

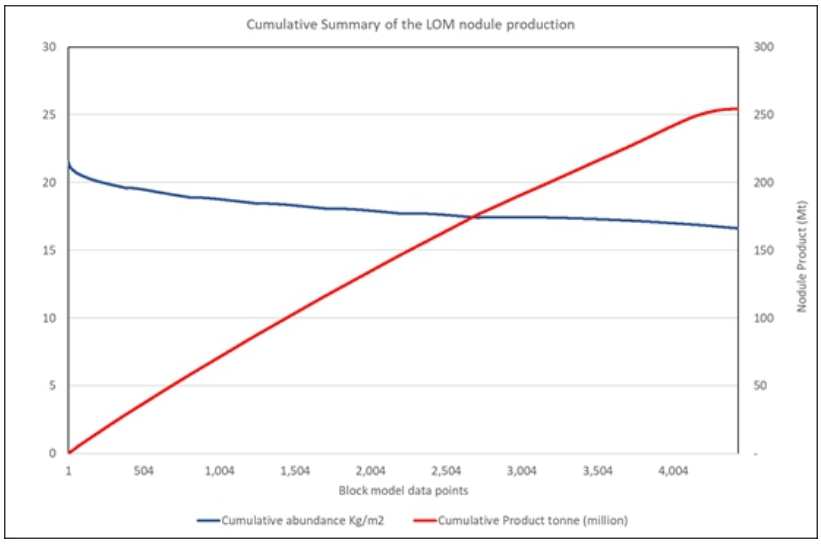
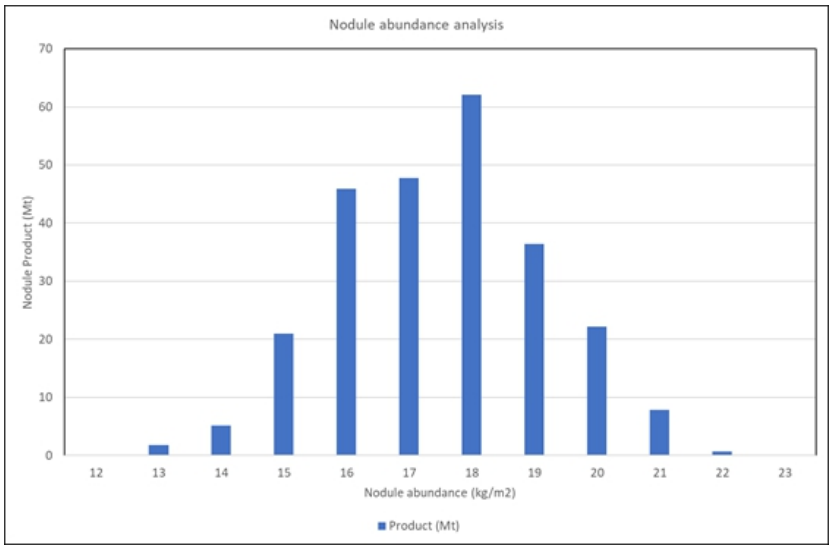


Figure 13.29 Histogram of nodule abundance



The LOM collector speed and nodule abundance over the LOM are detailed in Figure 13.30, Figure 13.31 and Figure 13.32.

Figure 13.30 Hidden Gem collector speed nodule abundance relationship

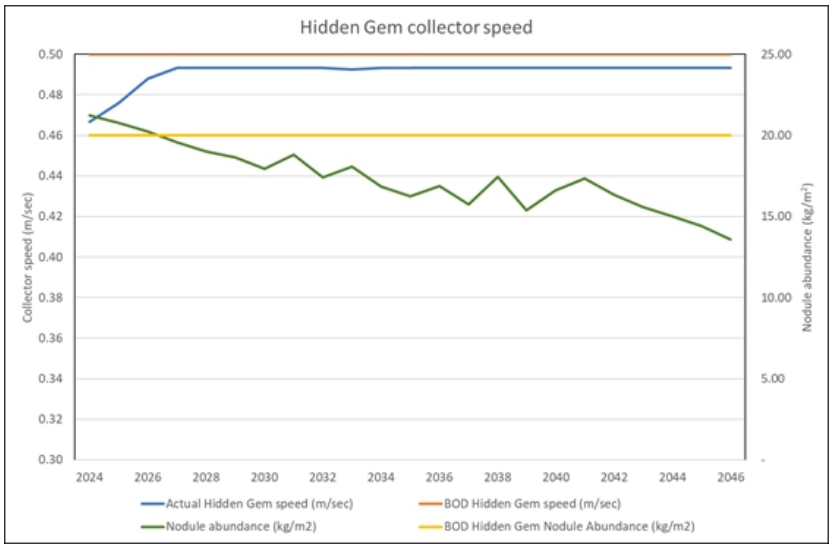


Figure 13.31 Drill Ship 2 collector speed nodule abundance relationship

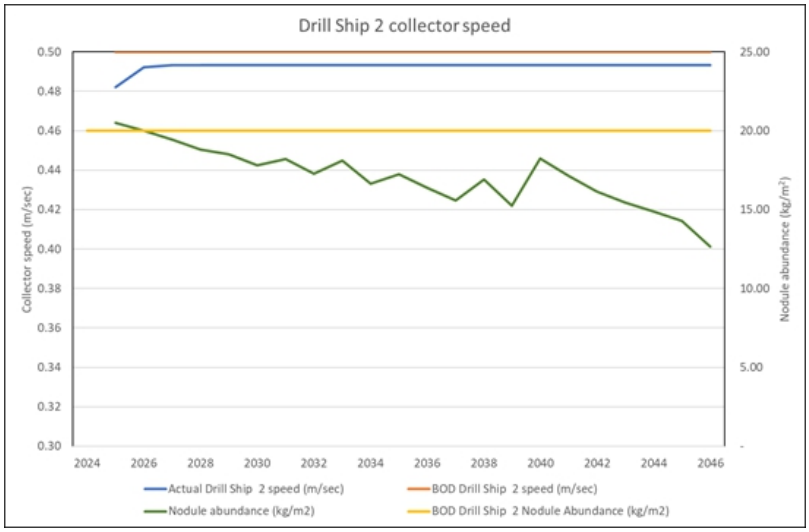
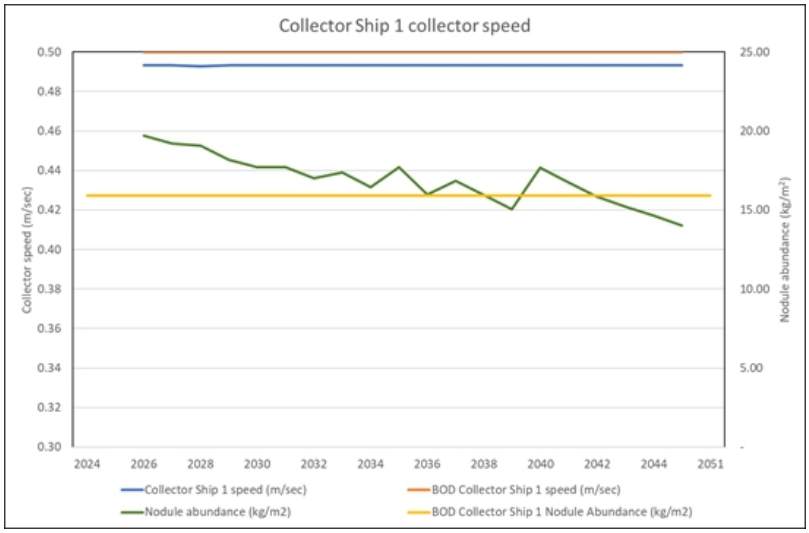


Figure 13.32 Collector Ship 1 collector speed nodule abundance relationship



13.7.4 Inferred Mineral Resources

The LOM production sequence includes 6 Mt (wet) of nodules that are classified as Inferred Mineral Resources. This is approximately 2% of the total LOM production. Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves.

14 Processing and recovery methods

The following subsections with respect to process description, production rates and consumables were developed for a processing rate of 4.88 Mt/y (dry basis) of nodules. Subsequently, the resource definition has allowed for an increase in proposed processing rate and, with it, additional processing lines. The extrapolated production information, including toll processing at existing RKEF plants (Project Zero), is discussed in Sections
21 and 22 - this was developed by DeepGreen and forms the basis of the economic evaluation.

14.1 Process design basis

NORI has selected a combined pyro- plus hydrometallurgical process as the basis for the recovery of Ni, Cu, Co and Mn from polymetallic nodules for this IA. This is one of the process alternatives discussed in various literature sources (see Section 13). A pyrometallurgical front end of the plant uses the well-known nickel laterite process featuring rotary kilns and electric furnaces (RKEF) that respectively calcine and smelt the nodules to form an alloy and a slag. The alloy is then sulphidised to form a matte and then partially converted in a Peirce-Smith converter operation to remove iron, following the processing route that Societé Le Nickel used to operate at their Doniambo plant in New Caledonia. The matte from the sulphidation step will then be sent to the hydrometallurgical refinery.

The hydrometallurgical refinery design is based on a sulphuric acid leach flowsheet. A two-stage leach based on the flowsheets of the base metal refineries applied by several platinum producers in South Africa and the United States, particularly Lonmin and Sibanye Stillwater, will be used to produce copper cathode and a pregnant leach solution rich in nickel and cobalt, while low in copper. Further processing of the pregnant leach solution is based on mixed-sulphide precipitate processing flowsheets employing solvent extraction. The final production of battery-grade nickel and cobalt sulphates would use crystallisation.

The pyrometallurgical process generates a manganese silicate stream that can be sold to the manganese industry and a small slag stream that can be sold for construction, while the hydrometallurgical plant produces an ammonium sulphate by-product for sale to the fertiliser industry. Thus, together with the ability to recycle other hydrometallurgical side-streams to the pyrometallurgical process, the flowsheet has neither tailings ponds nor permanent slag repositories and does not generate substantial waste streams.

The following sections provide a description of the assumed process flowsheet and processing parameters.

14.1.1 Plant throughput and availability

The targeted processing rate for the proposed processing plant is 4.88 Mtpa of nodules, dry basis.

In RKEF plants, the kilns and furnaces are close-coupled due to the need to transfer hot calcine from the kilns to the furnaces, with only the transfer system and the furnace feed bins as a buffer between them. An Operating Factor of 85% was assumed for the pyrometallurgical facility based on typical RKEF design. Operating Factor considers planned and unplanned equipment outages and periods of slow-down. It relates the nominal hourly throughput (the rate at which the equipment should be able to operate) to annual throughput:

Annual Throughput = Nominal Hourly Rate × 8,760 hours per year × Operating Factor.

The hydrometallurgical process is decoupled from the pyrometallurgical process by intermediate storage and is assumed to operate for 8,000 hours per year at the nominal rate (equivalent to an Operating Factor of 91.3%).

Production values are reported in Section 14.3.2.2.13.

14.1.2 Feed properties

The nodules are expected to arrive at site largely intact and partially drained of excess sea water. They have a size distribution that is unspecified, but the majority are expected to be <50 mm, i.e., suitable for feeding to the kilns. Incoming nodules will be screened, and the oversize will be crushed.

14.1.3 Nodule composition, speciation, and assay reconciliation

Assay information based on recent (2018, NORI Area D Campaign 3 and 2020, Campaign 6A and 6B) core box samples was provided by NORI. A few adjustments were made to provide an input assay to process modelling that adds up to 100%. The assay as used in process modelling is given in Table 14.1.

Table 14.1 Nodule assay for use in process modelling

Component	Weight %
Loss on Ignition (LOI)	15.87
Oxygen in Mn Compounds	*5.14*
Crystalline Water	*10.73*
Al_2O_3	3.95
CaO	2.43
CoO	0.18
Cr_2O_3	0.01
CuO	1.43
Fe_2O_3	9.49
MgO	3.18
Mn_{Total}	31.2
MnO	0.0
MnO_2	39.44
Mn_2O_3	8.95
MoO_3	0.09
NiO	1.78
P_2O_5	0.36
S	0.11
SiO_2	11.68
ZnO	0.21
Other (assayed)	5.60
Other (unaccounted)	0.37
Total	**100**

The principal changes that were made were:

- Manganese was reported as MnO, but it is predominantly MnO_2 in polymetallic nodules. Recent test work (Section 13) has shown the manganese to be $MnO_{1.9}$. For the purposes of process modelling, this has been apportioned to the compounds MnO_2 and Mn_2O_3 as shown above.

- While LOI for nickel laterites is virtually all crystalline water, this is not the case for the nodules. Higher oxides of manganese decompose when heated to LOI measurement temperatures. Hence the reported LOI has been split into crystalline water and the oxygen that is expected to be lost upon heating as shown in Table 14.1.

- Molybdenum was added to the assay in accordance with measurements during recent test work. Although molybdenum is only present in small amounts, it increases in concentration during processing and becomes of metallurgical significance in the converting operation. The current refining flowsheet does not account for molybdenum. Additional processing steps are required to separate molybdenum and will necessitate additional capital and operating expenditure. While it may be possible to produce a marketable molybdenum by-product, further development would be required to determine the process requirements.

- Process modelling for the RKEF plant was based on using existing METSIM models for nickel laterite plants, modified for the abundance of manganese and copper (and the presence of molybdenum). The assay provided by NORI had a comprehensive list of elements, many at the ppm level, much of which would likely report to EF slag. This part of the assay was therefore assigned as 'Other (assayed)' and dealt with accordingly.

- The revised assay still did not add up to 100%. The missing assay was assigned to 'Other (unaccounted)' and also assumed to report to slag.

Free moisture content of well drained nodules is assumed to be 20% based on recent test work.

14.1.4 Final product specifications

The facility design is based on achieving the preliminary product specifications for nickel and cobalt sulphate products shown in Table 14.2.

Table 14.2 Preliminary Ni, Co product specifications

Component	Units	$NiSO_4$-$6H_2O$	$CoSO_4$-$7H_2O$
Ni	wt%	>22.0	<0.0001
Co	wt%	<0.001	>20.5
Cu	wt%	<0.0001	<0.0005
Fe	wt%	<0.0001	<0.001
Cr	wt%	<0.0001	<0.0005
Mn	wt%	<0.0001	<0.0001
Pb	wt%	<0.0001	<0.0001
Zn	wt%	<0.0001	<0.0005
Mg	wt%	<0.01	<0.01
Na	wt%	<0.02	<0.03
K	wt%	<0.0001	<0.0005
Ca	wt%	<0.0005	<0.005
Si	wt%	<0.002	<0.02

Copper is to be electrowon to cathode without a solvent extraction stage ahead of it. This is to maximise Ni and Co recovery in the subsequent stages. As a result, the Cu cathode quality is expected to be ≥99.9% for the assumed converter matte composition.

The slag produced by the EF operation is rich in manganese and would be marketed as feed to the ferro-manganese, silico-manganese industry.

Converter aisle slag that is not recycled internally may be sold as useful product, e.g., for road construction, sand blasting, or cement additive.

14.2 Project Zero

For Project Zero, NORI proposes to toll treat polymetallic nodules at existing RKEF smelters, utilizing excess industry capacity.

NORI has completed surveys of existing plants in China and Indonesia and commenced discussion with potential partners in Malaysia that are interested in Mn silicate offtake and interested in constructing and operating RKEF furnace lines. NORI advises there is significant interest from many parties in China to utilise RKEF plants which may become stranded as a result of the Indonesian government nickel laterite ore export ban restricting supply of the nickel laterite feedstock that they currently utilise or the general overbuilding of capacity for the nickel pig iron and ferronickel market. These RKEF plants were originally built to convert nickel laterite to nickel pig iron. A review by Kingston Process Metallurgy (Kingston Process Metallurgy, 2020) concluded that existing RKEF lines could be readily converted to process polymetallic nodules to marketable NiCuCo intermediate product(s) and a manganese silicate slag product for sale.

The availability of a total of four 1 Mtpa (wet) third party RKEF lines was assumed for the IA.

Options for toll treatment of matte in hydrometallurgical refineries were identified in Europe and Canada.

As part of Project Zero, NORI is also investigating the option of selling a nickel alloy product, which also contains copper and cobalt. The alloy would be produced at the end of RKEF process. Rather than reporting to the sulphidation stage of the pyrometallurgical plant, the alloy would be sold the market. This alloy is assumed to have a nickel grade of 15.5%.

14.3 Project One

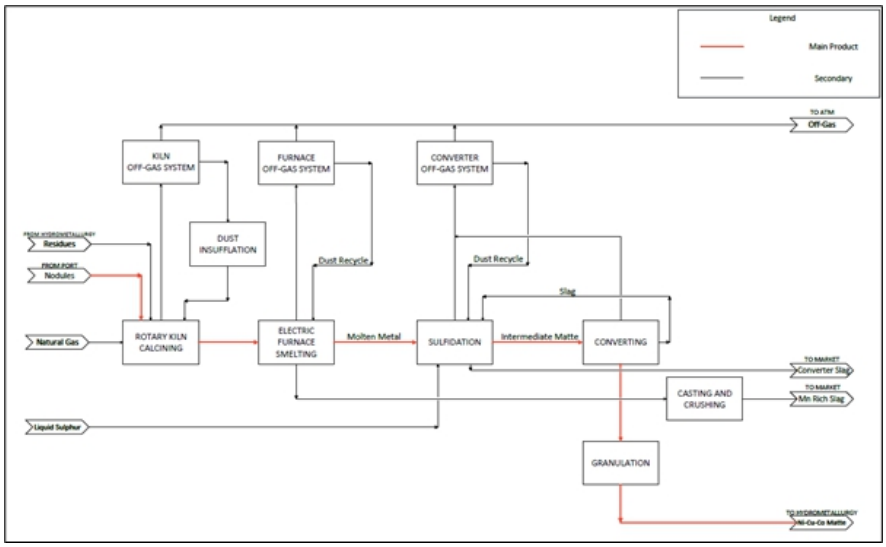
14.3.1 Process description

14.3.1.1 Pyrometallurgical processing

Figure 14.1 shows the pyrometallurgical process flowsheet. It differs from most RKEF plants producing ferronickel in that:

- Dryers have been omitted. At 20% free moisture, the moisture content of the nodules is similar to dry ore discharged from the dryers at most nickel laterite plants. Nickel laterite ores have very variable moisture contents due to exposure to rainfall and can be muddy, sticky and difficult to handle and crush. The dryers therefore serve to render the ore easier to handle and provide a steady moisture feed to the kilns. These are not deemed to be issues for the nodules.
- Free moisture associated with the nodules is sea water.
- A converting operation is not normally part of a ferronickel plant (post tap-hole refining is typically performed in ladle operations). The proposed process follows SLN’s former practice of adding molten sulphur to the ferronickel in Peirce-Smith converters and blowing out most of the iron. PT Vale Indonesia also has a converter aisle after the EFs, however they add the sulphur to the kiln discharge and use the converters solely for iron removal. (Sulphur addition to the kiln discharge is highly inefficient and releases substantial amounts of sulphur dioxide and was therefore not selected for this project.)

Figure 14.1 Pyrometallurgical process block flow diagram



14.3.1.2 Pyrometallurgical process steps

Processing through the pyrometallurgical plant can be summarised as follows:

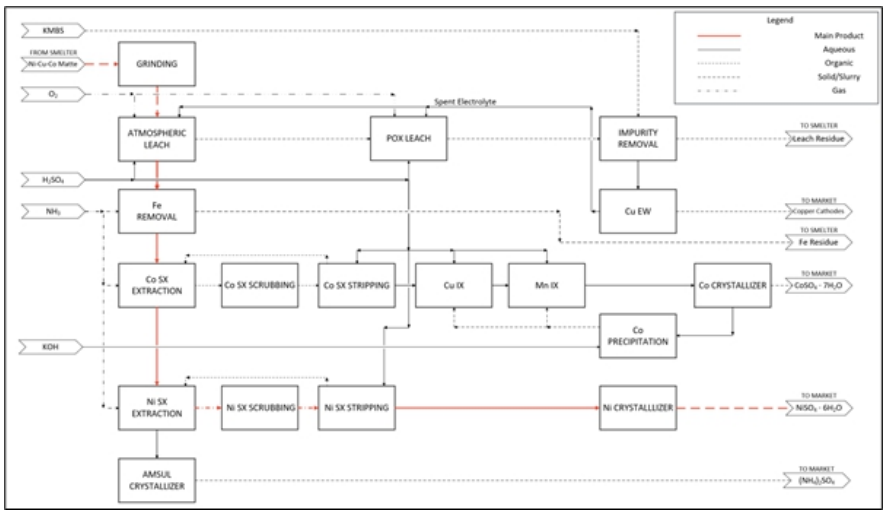
- Nodules are assumed to arrive at the plant on a continuous, 24-hour basis. Limited storage is therefore required at the plant—a 3-day stockpile has been allowed for.
- The nodules are screened at 2 inches and the oversize (expected 10–15%) are crushed.
- Nodules are conveyed to the kiln feed bins.
- Nodules are fed to the four, gas-fired kilns together with reductant coal, silica flux and residues from the hydrometallurgical refinery. Silica flux is added to target a given slag composition in the EF.
- The nodules are dried, calcined and partially reduced in the kilns.
- Off-gas from the kilns is taken from the feed end of the kilns and sent to particulate cleaning (electrostatic precipitators).
- Collected kiln dust is recycled dry via dust insufflation, i.e., by pneumatically conveying it via a carefully metered dosing system through a lance (pipe) placed through the hot end of the kiln and aimed at the burner flame.
- Hot calcine discharges continuously from the hot end of the kilns into hoppers that periodically discharge into refractory-lined calcine transfer containers.
- The calcine transfer container moves on rails away from the kiln and is hoisted up to the EF feed floor by crane where it is discharged to one of several furnace feed bins. It then returns to the kiln discharge hopper for the next load.
- With four kilns and three EFs, there is provision for cross-feeding.
- In the three, six-in-line (Soderberg electrodes) EFs, the calcine is smelted to produce a metal alloy and a large volume of manganese bearing slag.
- The manganese slag is cast, crushed and trucked to port for export.
- The metal alloy is tapped intermittently into ladles and taken to the converter aisle by crane.

- Off-gas from the furnace is cooled and cleaned of particulate. Collected dust is recycled back to the furnace via the kiln discharge hoppers.
- A large portion (e.g., 50%) of the molten alloy is sent to one of two pig casting machines, forming 20 kg ingots. The pig casters have enough capacity to cast the entire 60 t/h alloy production rate, allowing decoupling of the EF and converter aisle operations.
- In the converter aisle, molten alloy from the EFs is poured into one of two sulphidation vessels (SV). These are large Peirce-Smith converters (15’ diameter by 35’ long).
- Solid alloy ingots are added to the SVs as coolant to help maintain a suitable temperature.
- Silica flux is added to form slag with the iron that is being removed in the SV.
- As part of the converter aisle area, there is a sulphur melting facility where the sulphur is melted and warmed to 140 °C. It is then pumped to the Peirce-Smith vessels through heat-traced lines (steam). Although only two of the four Peirce-Smith vessels will be in use for sulphidation at any one time, there is provision for putting it into any of the vessels when one is down for maintenance/rebuild.
- In the SVs, liquid sulphur to transform the alloy to matte is pumped through a few of the tuyerès in the barrel. Air is blown through the remaining tuyères at the same time. Before and after sulphur is pumped, i.e., during roll-in, roll-out, steam is passed through the sulphur tuyères.
- The SVs operate with a large heel in a semi-continuous mode, i.e., relatively small amounts of product matte are removed at a time. The matte is an intermediate matte containing around 30% iron. Slag from the SVs is relatively low in pay-metals and can be granulated.
- The intermediate matte from the SVs is taken to the third large finishing vessel (FV) (also with 15’ diameter by 35’ long). The fourth vessel serves as spare for use when another vessel is down for maintenance/reline.
- Silica flux is added to form slag with the iron that is being removed in the FV.
- When there is sufficient intermediate matte in the FV, blowing commences and continues until the iron in the matte is 5%. This is product matte and it is removed at the end of the batch and water-granulated. Granulated matte is then sent to the hydrometallurgical refinery.
- Slag from the FV is too rich in pay-metals to discard and it is therefore sent back to the SVs.
- Sulphur usage efficiency is assumed to be very high and as a result the matte is sufficiently sulphur-deficient (metallised) that very little sulphur dioxide is formed in the process. The gases from the Peirce-Smith vessels can therefore be treated for particulate capture only and discharged to stack. (It is understood that the one practitioner of this process, SLN in New Caledonia, did not require any sulphur dioxide scrubbing for their sulphidation process). Treatment for SO_2 will depend on the sulphur usage efficiency, but also on any limits on stack emissions and/or air quality in the smelter and nearby areas.

14.3.1.3 Hydrometallurgical processing

Figure 14.2 shows the hydrometallurgical process flowsheet. It consists of a unique combination of proven hydrometallurgical steps based on platinum base metal refineries and battery-grade sulphate production.

Figure 14.2 Hydrometallurgical process block flow diagram



14.3.1.4 Hydrometallurgical process steps

Processing through the hydrometallurgical refinery can be summarised as follows:

- Ni-Cu-Co rich matte is transported from the pyrometallurgical facility to matte storage. An allowance of 3 days of storage space has been made.
- The matte is ground in a mill to reduce particle size before leaching. The ground matte is then pulped and stored with 8 hours of storage capacity.
- Pulped matte feed is then pumped to the first stages of atmospheric leaching, where oxygen and spent electrolyte from copper electrowinning leach the matte. In the final stages of atmospheric leaching, no oxygen is added, promoting metathesis reactions where copper in solution substitutes the nickel remaining in the matte. This leads to a solution high in nickel and low in copper, and a matte depleted in nickel and upgraded in copper.
- The remaining upgraded matte then proceeds to pressure leaching at 220 °C that uses autoclave technology to leach as much of the matte as possible using spent electrolyte, make-up acid and oxygen.
- Any residue remaining is collected and returned to the pyrometallurgical refinery for further recovery, while the copper rich solution from the autoclave is purified, cooled and sent to copper electrowinning to produce copper cathodes. Spent electrolyte is recycled to the atmospheric and pressure leach steps.
- Nickel solution from atmospheric leaching proceeds to iron removal, where ammonia is added to raise the pH and precipitate iron. The iron precipitate is separated and sent back to the smelter to recover any entrained pay metals and to avoid generating an iron waste stream.
- The iron free solution then proceeds to cobalt solvent extraction (SX), where cobalt is extracted using an organic solvent. The cobalt-free raffinate then proceeds to nickel SX, while the cobalt is stripped from the organic using dilute acid.
- The cobalt strip solution passes through purification, where copper and manganese Ion Exchange (IX) are used to purify any remaining impurities. Cobalt hydroxide precipitated from the cobalt crystalliser bleed is used for pH control to avoid introducing potassium as an impurity.

- The pure cobalt solution is then sent to crystallisation to produce cobalt sulphate heptahydrate, which is bagged for sale.
- The cobalt free raffinate, which is rich in nickel then has the nickel extracted using a nickel selective organic extractant. The nickel is then stripped from the organic using dilute acid before being sent to crystallisation to produce nickel sulphate hexahydrate for sale.
- The remaining raffinate from nickel SX is sent to ammonium sulphate crystallisation to produce ammonium sulphate for use as a fertiliser.
- A small bleed from the ammonium sulphate crystalliser is sent to an effluent treatment system, where mixed-metal hydroxides are produced in the first step and magnesium and manganese hydroxides are produced in the second step. The mixed-metal hydroxides are recycled back to atmospheric leaching while the magnesium and manganese hydroxides are recycled back to the pyrometallurgical plant. The remaining solution is recycled back to ammonium sulfate crystallizer.

14.3.2 Key process parameters

Process parameters relating to throughput, stream assays, energy and reagent consumption are summarised in the tables shown in the following sub-sections.

14.3.2.1 Pyrometallurgical plant

14.3.2.1.1. Calcining

Calcining has four large kilns 6 m in outside diameter and 135 m long. These are amongst the largest in use in the nickel laterite industry. The information given in Table 14.3 is for each kiln operating at nominal throughput.

Table 14.3 Kiln parameters

Parameter	Value
Nodules to kiln (dry basis)	164 t/h
Nodule moisture (wet basis)	20%
Silica flux to kiln	9.4 t/h
Insufflated recycle dust to kiln	10.3 t/h
Reductant coal to kiln (dry basis)	14.0 t/h
Calcine production	144 t/h
Calcine temperature	900 °C
Natural gas to kiln	8,271 Nm^3/h

14.3.2.1.2. Electric furnace smelting

The design includes three high power EFs. They are rectangular with six Soderberg electrodes. Slag will be laundered to pits for solidification and subsequent reclaim. Alloy will be tapped intermittently into ladles—the hourly rates indicated are the average rates at which slag and alloy are made inside the furnace. The information given in Table 14.4 is for each furnace operating at nominal throughput.

Table 14.4 Electric furnace parameters

Parameter	Value
Calcine feed rate	192 t/h
Power input	87 MW
Average alloy production rate	18.7 t/h
Average slag production rate	165 t/h
Alloy temperature	1,450 °C
Slag temperature	1,500 °C
Metal composition (wt%)	15.8 Ni, 61.9 Fe, 12.5 Cu, 1.52 Co, 3.64 Mn
Slag composition (wt%)	52.6 MnO, 23.4 SiO_2, MnO/SiO_2=2.25

14.3.2.1.3. Converter aisle

Alloy from the electric furnaces is tapped periodically into ladles and transferred by crane to the converter aisle. A large part of it (in the range of 50%) is cast into ingots to help with the converter heat balance in the SVs. The molten alloy is fed directly to the SVs. There are two SVs making an intermediate matte which is then transferred to a single operating FV. Unlike the information for the kilns and electric furnaces (per unit), the information given in Table 14.5 is for the entire production coming from the electric furnaces. Once again, while converter aisle operations are semi-continuous and batch, the production rates shown below are hourly average except for blowing rates, which are instantaneous.

Table 14.5 Converter aisle parameters

Parameter	Value
Total alloy to sulphidation	56.1 t/h
Sulphur to sulphidation	4.2 t/h
Silica flux to sulphidation	12.2 t/h
Air blowing rate (two vessels, instantaneous)	90,000 Nm^3/h
Operating temperature	1,300 °C
Intermediate matte production	32.7 t/h
Discard slag production	67.5 t/h
Intermediate matte composition (wt%)	27.3% Ni, 30.0% Fe, 20.6% Cu, 3.03% Co, 13.0% S
Silica flux to finish vessel	4.7 t/h
Air blowing rate (one vessel, instantaneous)	45,000 Nm^3/h
Operating temperature	1,300 °C
Final matte production	21.2 t/h
Recycle slag production	20.1 t/h
Final matte composition (wt%)	40.9% Ni, 5.0% Fe, 30.5% Cu, 3.35% Co, 20.0% S

14.3.2.2 Hydrometallurgical refinery

14.3.2.2.1. Matte storage and grinding

This area consists of storage and stockpile space for the finished Ni-Co-Cu matte from the pyrometallurgical facility to allow decoupling of the hydrometallurgical refinery. An allowance of 3 days of storage space has been made. The matte is ground in a mill to reduce particle size to a P_{80} of 30 µm before leaching.

14.3.2.2.2. Atmospheric leaching

Atmospheric leaching has two goals:

1. The dissolution of the contained metals within the matte.
2. Providing separation between the copper and nickel by producing:
    a. A leach solution high in nickel and cobalt and low in copper.
    b. A residual matte enriched in copper but depleted in nickel and cobalt.

The first step in atmospheric leaching consists of ground matte slurrying and storage, providing eight hours of surge capacity. This matte slurry is fed continuously to five atmospheric leach tanks operating at 85 °C, where it is mixed with spent electrolyte from copper electrowinning. Oxygen is sparged into the first three tanks, which promotes leaching of the matte. The nickel in the matte, which primarily exists as heazlewoodite (Ni_3S_2), reacts according to the following reaction:

$$2Ni_3S_2(s) + 2H_2SO_4(aq) + O_2(g) \rightarrow 2NiSO_4(aq) + 2H_2O(l) + 4NiS(s)$$

Note that solid millerite (NiS) is left as a by-product of the reaction. No oxygen is added in the final two tanks, allowing metathesis reactions between the copper in solution from electrowinning and any copper leached in the first three tanks and the remaining heazlewoodite. This process enhances the leaching extent of nickel and depletes the solution of copper. The principal metathesis reactions occur as follows:

$$2Ni_3S_2(s) + 2CuSO_4(aq) \rightarrow 2NiSO_4(aq) + 2Cu_2S(s) + 4NiS(s)$$

$$NiS(s) + CuSO_4(aq) \rightarrow NiSO_4(aq) + CuS(s)$$

Similar reactions occur for cobalt leaching and metathesis as well. The nickel and cobalt rich solution are then separated from the remaining matte and proceeds to iron removal and then cobalt solvent extraction (SX). The remaining matte is sent to pressure oxidative leaching. See Table 14.6 for a summary of key process parameters. Note that the hourly values reported are on the basis of 8,000 operating hours per year (see Section 14.1.1).

Table 14.6 Atmospheric Leaching Parameters

Parameter	Value
Matte feedrate	19.75 t/h
Solids fraction of leach feed slurry	55%
Leach operating temperature	85-90 °C
Oxygen addition	1.72 t/h
Spent electrolyte addition	109.2 t/h
Nickel concentration in leach discharge solution	85 g/L Ni
Copper concentration in leach discharge solution	<1 g/L Cu
Iron Concentration in Leach Discharge Solution	<2 g/L Fe
Acidity of leach discharge solution	<1 g/L H_2SO_4

14.3.2.2.3. Pressure oxidative leaching

Pressure oxidative (POX) leaching is intended to maximise the dissolution of the copper enriched matte from atmospheric leaching. The matte is first mixed with spent electrolyte from electrowinning and 93% sulfuric acid in a feed tank before being pumped to the autoclave operating at 2800 kPa and 220 °C. Oxygen and cooling water are added directly to the autoclave. After leaching, any residue remaining is separated from the solution and is sent to the pyrometallurgical refinery. The copper rich solution from the autoclave is purified, cooled and sent to copper electrowinning. Key parameters for the POX leach are provided in Table 14.7.

Table 14.7 Pressure oxidative leaching parameters

Parameter	Value
Residence Time	1.5 hours
Pressure	2800 kPa
Operating temperature	220 °C
Oxygen utilisation	85%
Oxygen addition	11.2 t/h
Cooling method	Direct Injection
Cooling water addition	96.0 t/h
Spent electrolyte addition	127.4 t/h
93% sulfuric acid addition	3.2 t/h
Nickel concentration in POX discharge solution	34 g/L Ni
Copper concentration in POX discharge solution	72 g/L Cu
Acidity of POX discharge solution	10 g/L H_2SO_4

14.3.2.2.4. Impurity removal and copper electrowinning

Copper solution from pressure oxidative leaching is purified and cooled before proceeding to copper electrowinning (EW). Impurities like selenium and tellurium are removed via reduction with potassium metabisulfite before EW. Note that this impurity removal step may not be necessary but has been left in as a cost allowance.

Purified copper solution from POX leaching proceeds to the electrowinning cellhouse. The electrowinning cellhouse is a well-ventilated building that houses two parallel rows of electrowinning cells. Ventilation serves to prevent the accumulation of acid mist, which is a health hazard and can result in electrical fires. A single overhead crane services the cells. Servicing activities include harvesting the copper cathode product, replacing them with fresh cathode sheets, replacing damaged anodes and maintenance. Rectifiers and transformers provide the power at the correct potential difference for effective operation.

In EW, guar and other trace additives are added to improve the properties of cathode produced, which form when electrical current is applied across the electrowinning cells.

Purified copper solution from POX leaching is combined with recirculated electrolyte in the electrowinning feed tanks. The resulting electrolyte feed solution then passes through the electrowinning cells where it comes into contact with the cathodes and anodes. The anodes have been assumed to be lead for the purposes of this estimate. The cathodes are comprised of stainless-steel starter sheets that accumulate copper as the electrowinning reactions proceed. Electrical current passing through the cells drives two reactions:

1. At the cathode, an accumulation of electrons drives the reduction of Cu^{2+} in solution to Cu^{o}, causing the copper to plate on the stainless-steel starter sheets.

2. At the anode, a deficit of electrons drives the decomposition of water into H^{+} and O_2, causing the formation of sulfuric acid and the evolution of oxygen gas.

The current density is maintained at 200 A/m^2 to ensure controlled, even plating for a good quality cathode. The spent electrolyte is only depleted in copper by 3 g/L. A significant portion of the spent electrolyte is recirculated to the electrowinning feed tanks while the remainder exits the cellhouse and is sent to leaching for use as a lixiviant.

Table 14.8 provides the key parameters for impurity removal and copper EW.

Table 14.8 Impurity removal and copper electrowinning parameters

Parameter	Value
Impurity removal reagent	Potassium metabisulfite (KMBS)
Current density	200 A/m^2
Cell voltage	2.35 V
Electrowinning operating temperature	45 °C
Electrowinning copper bite	3 g/L Cu
Spent electrolyte copper concentration	40 g/L Cu
Spent electrolyte acidity	50–60 g/L H_2SO_4

14.3.2.2.5. Iron removal

Iron is removed from the nickel rich solution that leaves the atmospheric leach by increasing the pH, using ammonia, in a series of continuous stirred-tank reactors. This causes the iron to precipitate as iron (III) hydroxide, allowing a series of thickeners and filters to separate the iron solids from the solution. The iron solids are sent back to the smelter to recover any entrained pay metals and to avoid generating an iron waste stream. The iron-free solution then proceeds to cobalt solvent extraction (SX).

Table 14.9 provides the key iron removal parameters.

Table 14.9 Iron removal parameters

Parameter	Value
pH control agent	NH_3
Target pH	5-5.5
Iron filter cake production rate	0.47 t/h
Solids fraction of the iron filter cake	60 wt%

14.3.2.2.6. Cobalt solvent extraction

Cobalt SX consists of a series of mixer-settler units that facilitate the removal of cobalt from the iron-free solution. The circuit consists of three parts: extraction, scrubbing and stripping.

In extraction, the iron-free solution first contacts an organic solution that selectively removes cobalt via mixer tanks. The organic is comprised of bis (2,4,4 trimethylpentyl) phosphinic acid, an extractant with an affinity for cobalt, and a high flash point carrier solvent. After contacting the organic, the aqueous solution is separated using settler tanks. Extraction occurs in four mixer-settler stages. The cobalt free aqueous solution is pumped to nickel SX.

The cobalt-loaded organic from extraction then proceeds to scrubbing, where it is scrubbed with a weakly acidic, cobalt-rich aqueous solution to remove any impurities that may have loaded onto the organic. Scrubbing occurs in three mixer-settler stages. The spent scrubbing solution is recycled to extraction.

The scrubbed organic now proceeds to stripping, where the cobalt is stripped from the organic with sulfuric acid solution. Stripping occurs in three mixer-settler stages. A part of this cobalt strip solution is used to prepare the scrubbing solution and the remainder proceeds to cobalt purification. See a summary of the key parameters in Table 14.10.

Table 14.10 Cobalt SX Parameters

Parameter	Value
Extraction pH Control Agent	NH_3
Target Extraction pH	5.5
Target Operating Temperature	60 °C
Extractant	Bis (2,4,4 Trimethylpentyl) Phosphinic Acid (Cyanex 272 or equivalent)
Diluent	High flash point aliphatic solvent
Scrubbing Solution	Cobalt strip liquor and dilute H_2SO_4
Target Cobalt Concentration Exiting Scrubbing	25 g/L Co
Strip Acid	Dilute H_2SO_4
Target Stripping pH	3.4

14.3.2.2.7. Cobalt purification

Cobalt purification serves to remove residual copper, manganese and other trace impurities that load in cobalt SX.

Copper is removed using ion exchange (IX) with an iminodiacetic acid resin. The copper loads onto the resin and is later stripped using sulfuric acid. Nickel present in solution will also load onto the resin. The stripped copper eluate is sent back to POX leaching. The copper-free cobalt solution proceeds downstream for manganese removal.

Manganese is also removed using IX, but with a Di-(2-ethylhexyl) phosphoric acid impregnated resin. Manganese, zinc and other base metals load onto the resin and are later stripped using sulfuric acid. The stripped manganese eluate is sent to effluent treatment. The purified cobalt solution is pumped to cobalt sulfate crystallization.

Cobalt hydroxide precipitated from the cobalt crystallizer bleed is used for pH control throughout cobalt purification to avoid introducing potassium as an impurity.

Table 14.11 summarises the key parameters below.

Table 14.11 Cobalt purification parameters

Parameter	Value
Copper IX resin	Chelating iminodiacetic acid (amberlite 718 or equivalent)
Copper IX design loading temperature	40 °C
Design product concentration	0.1 mg/L Cu
Design resin loading	0.05 mol Cu/L WSR
Copper IX elution reagent	Dilute H_2SO_4
Manganese IX resin	D2EHPA Impregnated (Lewatit VP OC 1026 or equivalent)
Manganese IX minimum loading temperature	20°C
Manganese IX maximum loading temperature	40°C
Resin loading capacity	13 g/L Zn
Manganese IX maximum operating pH	4
Manganese IX elution reagent	Dilute H_2SO_4

14.3.2.2.8. Nickel solvent extraction

Nickel SX consists of five extraction stages and serves to remove the nickel from the cobalt free raffinate that is pumped from cobalt SX. Organic solution comprised of neodecanoic acid, an extractant with an affinity for nickel, and a high flash point carrier solvent loads the nickel in extraction. The loaded organic is then scrubbed of any impurities that may have loaded before the nickel is stripped from the organic with sulfuric acid. A part of this nickel strip solution is then used for scrubbing and the remainder proceeds to nickel sulphate crystallisation.

To mitigate the risk of nickel-ammonium double salt precipitation, a portion of the nickel free raffinate from extraction is recirculated to the start of nickel SX. This serves to reduce the nickel concentration while increasing the ammonium sulphate concentration in the circuit. The remainder of the raffinate is pumped to crystallisation to produce ammonium sulphate. See a summary of the key parameters in Table 14.12.

Table 14.12 Nickel SX parameters

Parameter	Value
Extraction pH control agent	NH_3
Target extraction pH	6.85
Target operating temperature	60 °C
Extractant	Neodecanoic acid (commonly referred to as versatic acid 10)
Diluent	High flash point aliphatic solvent
Scrubbing solution	Nickel strip liquor and dilute H_2SO_4
Target nickel concentration exiting scrubbing	4 gpL Ni
Strip acid	Dilute H_2SO_4
Target stripping pH	5.2

14.3.2.2.9. Cobalt sulphate crystallisation and packaging

The purified cobalt solution from cobalt purification is sent to an evaporator where it is evaporated to saturation. The saturated solution is then fed to a crystalliser that uses steam, electricity and a vacuum to evaporate water at 38 °C and produce a $CoSO_4 \cdot 7H_2O$ slurry. For the purpose of this IA, the crystalliser design assumes the use of multiple effect evaporation, reducing steam consumption by using the evaporated water from the first stage of crystallisation to heat the second stage. The crystal slurry is then centrifuged before being dried to produce battery-grade $CoSO_4 \cdot 7H_2O$ crystals that are bagged in 1-tonne bags before delivery to market. Table 14.13 summarises the key parameters below.

Table 14.13 Cobalt sulphate crystallisation and packaging parameters

Parameter	Value
Target crystalliser operating temperature	38 °C
Crystalliser bleed rate	5.5% of Cobalt in feed
$CoSO_4$ saturation concentration	31wt% in solution
Solids fraction at crystalliser outlet	45wt%
Target dryer operating temperature	40 °C
Residual moisture in dryer	<0.25wt%
Product packaging type	1-tonne canvas bags

14.3.2.2.10. Cobalt Precipitation

The bleed from cobalt crystallization proceeds to a series of continuous stirred-tank reactors where potassium hydroxide is used to raise the pH of the solution and precipitate the cobalt as cobalt hydroxide.

Potassium hydroxide is used as a base instead of sodium hydroxide because it produces potassium sulfate when reacted with sulfuric acid while sodium hydroxide produces sodium sulfate. Potassium sulfate is a fertilizer and will not pose any problems when it eventually ends up in the ammonium sulfate product.

The precipitated cobalt hydroxide is filtered and washed using a belt filter before use as a pH modifier in cobalt purification. The remaining bleed stream is sent to effluent treatment. Table 14.4 summarizes the key parameters below.

Table 14.14 Cobalt precipitation parameters

Parameter	Value
pH Control Agent	KOH
Target pH	6–8
Solids fraction of the cobalt hydroxide filter cake	20wt%

14.3.2.2.11. Nickel sulphate crystallisation and packaging

The nickel strip solution from nickel SX then proceeds to an evaporator where it is evaporated to saturation. The saturated solution is then fed to a crystalliser that uses steam, electricity and pressure to evaporate water at 65 °C and produce a $NiSO_4 \cdot 6H_2O$ slurry. The crystallizer design assumes the use of multiple effect evaporation, reducing steam consumption by using the evaporated water from the first stage of crystallization to heat the second stage. The crystal slurry is then centrifuged before being dried to produce battery-grade $NiSO_4 \cdot 6H_2O$ crystals that are bagged in 1-tonne bags before delivery to market. Table 14.15 summarises the key parameters below.

Table 14.15 Nickel sulphate crystallisation and packaging parameters

Parameter	Value
Target crystalliser operating temperature	65 °C
Crystalliser bleed rate	10% of Nickel in feed
$NiSO_4$ saturation concentration	36wt% in solution
Solids fraction at crystalliser outlet	45wt%
Target dryer operating temperature	40 °C
Residual moisture in dryer	<0.25wt%
Product packaging type	1-tonne canvas bags

14.3.2.2.12. Ammonium sulphate crystallisation and packaging

The nickel SX raffinate is sent to an evaporator where it is evaporated to saturation. The saturated solution is then fed to a crystalliser that uses steam, electricity and pressure to evaporate water at 75 °C and produce an ammonium sulphate slurry. Like the nickel sulphate crystalliser, the ammonium sulphate crystalliser design assumes the use of multiple effect evaporation, reducing steam consumption by using the evaporated water from the first stage of crystallization to heat the second stage. The crystal slurry is then centrifuged before being dried to produce ammonium sulphate that is bagged in 1-tonne bags before delivery to market for use as a fertiliser. Table 14.16 summarises the key parameters.

Table 14.16 Ammonium sulphate crystallisation and packaging parameters

Parameter	Value
Target crystalliser operating temperature	75 °C
Crystalliser bleed rate	5% of ammonium sulphate in feed
$NiSO_4$ Saturation concentration	36wt% in Solution
Solids Fraction at crystalliser outlet	45wt%
Target dryer operating temperature	85 °C
Residual moisture in dryer	<0.25wt%
Product packaging type	1-tonne canvas bags

14.3.2.2.13. Effluent Treatment

A small bleed from the ammonium sulfate crystallizer along with a few other minor streams from the overall process are sent to effluent treatment.

The first step of effluent treatment is mixed-metal hydroxide (MMH) precipitation, which consists of a series of continuous stirred-tank reactors. Potassium hydroxide is added to the reactors in order to raise the pH to between 7–9 and precipitate remaining base metals in solution as hydroxides. The resulting hydroxides are then filtered and washed before being recycled back to atmospheric leaching so that the contained nickel, cobalt and copper are recovered. The MMH-free solution proceeds to the second step of effluent treatment.

The second step of effluent treatment is magnesium and manganese precipitation. Again, the precipitation occurs in continuous stirred-tank reactors. This time, potassium hydroxide is added to raise the pH to between 10–12 to precipitate magnesium and manganese from solution as hydroxides. The resulting hydroxides are then filtered and washed before being sent to the pyrometallurgical plant. The remaining solution, now largely consisting of potassium sulfate and ammonium sulfate, is recycled back to the ammonium sulfate crystallizer for recovery as fertilizer. Table 14.17 summarizes the key effluent treatment operating parameters below.

Table 14.17 Effluent Treatment Parameters

Parameter	Value
MMH Precipitation	
pH Control Agent	KOH
Target pH	7-9
Filter cake production rate	0.03 t/h
Solids fraction of the filter cake	50%
Mg & Mn Precipitation	
pH Control Agent	KOH
Target pH	10-12
Filter cake production rate	0.01 t/h
Solids fraction of the filter cake	50wt%

14.3.3 Recoveries

Recoveries of Ni, Cu and Co through each major process step are shown in Table 14.18. The process models used for the study are not interlinked and, importantly, do not incorporate the recycle of hydrometallurgical residues back to the smelter. For the purposes of the IA, it has been assumed that the pay-metals in residues can be recovered by the recovery factor for the pyrometallurgical steps. This gives the final recoveries shown at the bottom of the table.

Table 14.18 Pay metal recoveries for combined plant

Process Step	Nickel		Cobalt		Copper	
	t/y	Recovery	t/y	Recovery	t/y	Recovery
Nodules in	68,300	-	6,830	-	55,600	-
Final matte	64,600	94.6%	5,290	77.4%	48,100	86.5%
Hydrometallurgical products before recycle	64,000	98.9%	5,190	98.0%	46,400	96.2%
Recycled residue	700	94.6%	100	77.4%	1,800	86.5%
Overall recovery	64,700	94.6%	5,270	77.2%	48,000	86.2%

In addition to the above base metals, approximately 3.7 Mtpa of manganese silicate is to be produced, containing 52.6% MnO (98.9% recovery of manganese).

14.3.4 Plant footprint

No layout of the proposed plant has been developed during this IA.

14.3.5 Infrastructure requirements: utilities, transportation and production

No site visit or specific site selection has been completed for the proposed plant, however potential sites are discussed in Section 18. An important aspect of site selection for the project is the assumption that it has good existing infrastructure in place, including appropriate port facilities, access roads, high voltage power supply, natural gas supply, etc. To assist with site selection, the following tables show utility requirements, major consumables and product quantities.

Table 14.19 shows major utilities required by the combined pyro- and hydro-metallurgical plant.

Table 14.19 Estimated Power, Natural Gas and Water Requirements

Commodity	Annual Requirement	Indicative Peak Demand
Electrical power	2,496,000 MWh	~330 MW
Natural gas	310,183,000 Nm^3	41,000 Nm^3/h
Water	5,741,000 m^3	770 m^3/h

In addition to the 6.1 Mt/y (wet) of nodules shipped to the plant, various other consumables will also be required. Table 14.20 Summarises consumable quantities in excess of 10,000 t/y.

Table 14.20 Major consumable requirements

Consumable	Approximate Annual Requirement
Coal	473,000 t (wet)
Silica flux	407,000 t
Sulphur	31,000 t
Sulphuric acid (93 wt%)	176,000 t
Anhydrous ammonia	48,400 t

Products and by-products from the process plant will have to be shipped to market. These are summarised in Table 14.21. For the contained pay-metal in each of the main products, refer to Table 14.18.

Unlike most mining processes, the proposed mineral processing flowsheet seeks to make by-products rather than substantial waste streams and is not expected to require tailings ponds or other long-term waste storage on-site.

Table 14.21 Annual product quantities

Product	Annual Production (tpa)
Nickel sulphate	289,300
Cobalt sulphate	25,100
Copper cathode	48,000
Manganese slag	3,690,000
Converter slag	503,000
Ammonium sulphate	192,000

14.3.6 Process plant ramp-up

Based on thorough resource assessment, engineering, test work and pilot-scale demonstration of the process with polymetallic nodules as the feedstock, the ramp-up performance of the integrated commercial facility could be analogous to similar metallurgical facilities that followed a full development program and invested in debottlenecking efforts during commissioning and ramp-up. Provided the project follows that course, it is reasonable to assume a modified Series 2 McNulty ramp-up (Wasmund et al, 2011) with 95% of design capacity after 2 years and 100% after 2.5 years.

15 Project infrastructure

15.1 On-shore infrastructure

The infrastructure requirements for the Project, apart from the minerals processing facility described in Section 17, are modest compared to terrestrial resources projects of similar production capacities.

The site and host country for the minerals processing facility has not yet been confirmed. The site must be serviced by grid power, reticulated water, and natural gas. A location will be selected that is close to an industrial port, and near an existing municipality from which labour can be sourced.

DeepGreen engaged Global Location Strategies (GLS) to carry out a global benchmarking study of potential sites for the minerals processing facility. The study considered the primary site location drivers for this facility including logistics costs (both inbound and outbound) and energy costs (electricity and natural gas) and port depth. The study also considered:

- Renewable energy availability
- Political stability of country
- Ease of doing business in region/country

The GLS study recommended 13 countries for further consideration.

The Project will require some warehousing capacity to store critical spares (for example, critical spares for the collectors and riser). It is likely that a suitable facility can be purchased or leased and need not be constructed. Reasonable land acquisition costs have been allowed for in the project evaluation model.

15.2 Nodule transport

DRT has performed a preliminary assessment of the transportation fleet for transfer of nodules from NORI Area D. The nodules will be landed at an existing deep-water industrial port equipped with bulk offloading facilities and depending on the location of the process plant areas for stockpiling and loading ore on a rail line for transport to the plant. For this study we have assumed the port of Lazaro Cardenas, Michoacan, Mexico, 960 nm from the NORI Area D reference site (11N, 117W). Lazaro Cardenas has an existing, bulk minerals unloading area (Figure 15.1) as well as fuel bunkering facilities. Alternately, the vessels could be equipped for self-unloading in bulk or slurry form. Facilities to receive the ore and dewater it (in the case of slurry offloading) would be required.

This IA assumes transportation of nodules will be by chartered vessels. For Project Zero, transport vessels with 35,000 t deadweight capacities will be sufficient. For the Project One drillship conversions (3.6 Mtpa), two 100,000 t deadweight trans-shipment vessels are required. For Collector Ship 1, the fleet consists of three vessels with deadweight capacities of 100,000 tonnes. The vessels will require DP capability to enable them to be loaded at sea astern of or alongside the PSV. Transhipment vessels will be converted bulk mineral carriers with dynamic positioning (DP) to allow tracking behind the PSV during operations Figure 15.2.

Nodules will be transferred at sea from the PSVs to transhipment vessels. The materials handling method has not yet been confirmed, but multiple options exist (for example, pumping as a slurry or conveying a solid product) and will be evaluated in future studies. This IA assumes the PSVs and the transhipment vessels will be equipped to facilitate the transfer of nodules at sea. This method of offloading, known as tandem offloading, is well established for offloading of oil production vessels in remote areas of the world. DP tankers have been employed in this service for more than 20 years, see (Tannuri, et al., 2009).

The net transfer rate includes simultaneous unloading of the buffer tanks while transferring nodules directly from the lift system. An allowance is included for down time during collector maintenance cycles.

The interstitial moisture content of the nodule slurry during transportation is an important parameter in estimating transportation logistics and costs. Several dewatering methods have been studied previously in the 1970s (Kennecott Copper Corporation - Ledgemont Laboratory, 1977). This included evaluation of several dewatering methods using attrited nodule samples from pump loop tests. The results indicated the interstitial moisture of the cargo (excluding moisture contained in the nodule pores) could be between 5% (for centrifuge dewatering) to 20% (gravity separation). In addition to moisture content, the studies evaluated cut points and mineral recoveries in the dewatered ore. Based on these studies, gravity settling and decanting the wastewater was deemed the most practical and economic method of storage of nodules on the PSV, resulting in about 20% free moisture. The trans-shipment vessels would be equipped with vertical cuttings dryers to reduce the free moisture to 10% for shipping. Optimization of the material handling, dewatering and shipping requires reliable data on the attrition of nodules in the lift system, and on-board pumping. Losses of nodule material in the dewatering and handling process were estimated to be 7 - 10%. These estimates will need to be reassessed after the data collected during the Collector Test is analysed.

Any major on-shore maintenance for the off-shore equipment will be undertaken in third-party maintenance facilities.

Figure 15.1 Unloading bulk minerals at Mexican port of Lazaro Cardenas (Terminales Portuarias de Pacifico)



Figure 15.2 Offloading Operation: (left) with a conventional tanker; (right) with a DP tanker



16 Market studies

On 25 May 2012, DeepGreen Engineering Pte. Ltd. (DGE) (a wholly owned subsidiary of DeepGreen Inc) and Glencore International AG (Glencore) entered into a copper off-take agreement and a nickel off-take agreement whereby DGE agreed to deliver to Glencore 50% of the annual quantity of copper material and 50% of the annual quantity of nickel material produced by DGE.

For LME Registered Grade “A” Copper Cathodes, the delivered price is the official LME Copper Grade “A” Cash Settlement quotation as published in the Metal Bulletin averaged over the month of shipping or the following month at Glencore’s choice, plus the official long-term contract premium as announced annually by Codelco, basis CIF Main European Ports. For LME Registered Primary Nickel, the delivered price is the official LME Primary Nickel Cash Settlement averaged over the month of shipping or the following month at Glencore’s choice. For other copper-bearing material and other nickel-bearing material, the parties shall agree a price annually for the forthcoming calendar year on the basis of prevailing market prices for such copper products and such nickel products.

Both the nickel and copper off-take agreements are for the life of the NORI Area, and either party may terminate the agreement upon a material breach or insolvency of the other party. Glencore may also terminate the agreement by giving 12 months’ notice.

CRU International Limited (CRU) was commissioned by NORI to provide market overviews for the four main products from the NORI Area D Project: nickel sulphate ($NiSO_4$), cobalt sulphate ($CoSO_4$), copper, and a manganese product (CRU report dated October 23, 2020).

Over a five year horizon, CRU’s price forecasts are based primarily on supply and demand fundamentals. These are established from CRU’s detailed bottom-up analysis of supply by individual mine and finished product producer, and in-depth analysis of demand from individual applications. CRU also considers operating costs and inventories in its forecasts, as well as various other factors where relevant.

For the forecast beyond a five year horizon, cyclical supply-demand balances become hard to predict. Therefore, CRU’s longer term price forecasts are based on the Long Run Marginal Cost (LRMC) concept. That is, that prices in the long term will trend towards, and fluctuate around, the full economic costs (i.e., operating costs including an allowance for a return on capital) of the marginal tonne required to meet long term demand. For example, when prices are above the LRMC, CRU would assume that supply would be added and prices would subside. Assets selected for the LRMC analysis are a representative sample that are likely to be in production to satisfy future demand. CRU uses its Project Gateway classification system to select projects. It is important to consider where these new assets will be located, how large they will be and what processing technology they will adapt. The composition of future capacity and accompanying demand levels will have a significant impact not just on the LRMC assessment, but also the upside and downside risk associated with that assessment.

One exception to this long term price forecasting methodology is the cobalt market. Since the majority of cobalt is produced as a by-product of copper or nickel mining, supply is inelastic to the cobalt price, with supply decisions instead more likely to be driven by the market environment for the operations’ main copper or nickel product. This means that the Long Run Marginal Cost concept cannot readily be applied. Instead, CRU refers to historic pricing trends to establish a long term equilibrium price, taking into account longer term factors, such as the increasing importance of batteries as a cobalt end use, that might result in cobalt prices and product premia differing with historical trends.

Taking into account the foregoing assumptions and analysis, CRU expects $NiSO_4$ and $CoSO_4$ markets to undergo extreme growth from a relatively small current level of 181 kt nickel in sulphate and 35 kt of cobalt in sulphate in 2019, with markets to increase to 138 and 178 times their 2018 sizes respectively to 1.6 Mt nickel in sulphate and 500kt cobalt in sulphate by 2035, with much of this growth occurring post-2025. Electric vehicle production is the driver of this forecast growth.

In addition, copper and manganese ore markets are forecast to grow by 25% and 20% of their 2020 sizes by 2035, respectively. Copper and manganese demand will benefit from electric vehicle penetration, however the primary driver of growth for manganese ore will be steelmaking, and a variety of end use applications generally related to economic health for copper. A significant copper supply gap of around 5 Mtpa is expected by 2030 in the absence of new mine capacity, indicating that inducement pricing of greater than US$3.10/ lb Cu will be required to bring on new copper supply.

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CRU expects copper and $NiSO_4$ prices to rise in real terms by 2035, while manganese ore and $CoSO_4$ prices are forecast to remain flat, partly due to current prices being at or near a high point in the cycle, recent fall in prices, and expected modest growth in the global steel industry after the COVID 19 epidemic. The long-term cost of production is expected to rise for both copper and $NiSO_4$, helping to support prices.

The $NiSO_4$, $CoSO_4$ and copper to be produced by NORI are expected to be chemically and physically standard products and no marketability issues are expected. The sulphate forms ($NiSO_4$, $CoSO_4$) of these products are expected to be premium products and attract premia over pure nickel and cobalt.

The manganese silicate product differs in both physical and chemical specifications from standard forms of ore found in the market. NORI's manganese silicate is expected to have a manganese grade of around 40%, which matches neither the high grade (44% Mn) or low-grade (36–38% Mn) ore benchmarks. The product is expected to have SiO_2 and Al_2O_3 contents exceeding the most desirable levels for manganese products but a desirable high Mn to Fe ratio. NORI's processing route also reduces the oxidation state of the manganese oxide from MnO_2 to MnO, which will reduce the energy requirements for customers' downstream processing. On balance, CRU recommended adopting a small premium of 1- 3% of the 44% Mn ore benchmark price.

17 Environmental studies, permitting and social or community impact

NORI has commenced an Environmental and Social Impact Assessment (ESIA) process in support of an application for an exploitation license for the commercial development of deep-sea polymetallic nodules and has made significant progress with the baseline study program. Off-shore campaigns were completed over the period 2018 - 2020 to conduct oceanographic and sediment sampling activities. These provided the initial information to inform the scoping of baseline environmental studies required for the conduct of the ESIA investigations.

DeepGreen and NORI are seeking broad stakeholder consultation in the design and implementation of the ESIA program. In June 2019, NORI held a scoping study technical workshop with stakeholders in San Diego.

The development and status of the environmental program is described below. The baseline field study work commenced in 2012 and in October 2020 NORI began the first of six dedicated environmental baseline study off-shore campaigns in NORI Area D.

17.1 Permitting process

The ISA is mandated through UNCLOS to organize, regulate, and control all mineral related activities in the international seabed Area whilst preserving and protecting the marine environment. As NORI Area D is in the international seabed Area, the ISA is responsible for assessing any Environmental and Social Impact Assessment prepared by NORI and for granting the relevant contracts. NORI is currently one of 16 contractors with a license to explore for polymetallic nodules in the CCZ (refer ISBA/23/C/7, 5 June 2017).

Between 1998 and 2014, the ISA held workshops and developed a number of documents to provide guidance to contractors with respect to its expectations for responsible environmental management during the exploration and exploitation phases of mineral development. The ISA held a workshop “Towards an ISA environmental management strategy for the Area” over 20-24 March 2017 in Berlin Germany. The results of the workshop were published as ISA Technical Study 17 (ISA 2017).

The ISA has issued Regulations on Prospecting and Exploration for Polymetallic Nodules (adopted on 13 July 2000, updated on 25 July 2013). The regulations were complemented by the Legal and Technical Commission (LTC) recommendations for the guidance of contractors on assessing the environmental impacts of exploration (ISBA/25/LTC/6/Rev.1) which was most recently updated on 30 March, 2020. The draft exploitation regulations on deep-seabed mining were discussed at the 25th Session of the ISA (25 February to 1 March 2019 in Kingston Jamaica). The ISA had declared a target of 2020 to have the regulations approved but the COVID-19 pandemic disrupted the ISA program.

Although the environmental impact review process has not yet been finalised, the draft regulations outline the application process and the conditions that Contractors would need to implement during operations. All contractors have been made aware that the ISA requires the completion of the Environmental and Social Impact Assessment (ESIA) studies, culminating in an Environmental Impact Statement (EIS), in support of their applications for an exploitation license. Guidance for contractors in terms of what will be expected in the EIS has been provided in ISA Technical Study No. 10 (ISA 2012a). Further guidance will be provided with the completion of Standards and Guidelines for exploitation activities. The LTC has prioritized the development of six Standards and Guidelines, with three released for public comment in 2020 and the remaining three expected to be released in early 2021. The EIS, along with an Environmental Management System with subordinate Environmental Management and Monitoring Plans (EMMP), will be required as part of the application for an exploitation license within the Contract Area.

The environmental permitting process for the Area has been developed through a consultation program initiated by the ISA in 2013 and includes feedback obtained from multiple stakeholder groups. It is expected to involve a series of checks and balances, with reviews being conducted by the LTC with input from independent experts, as required. The recommendations of the LTC will then go before the ISA Council, which will then review the information provided and decide whether to approve the license application and, if so, what conditions should be applied.

NORI plans to conduct the ESIA studies largely in accordance with the draft ISA guidelines "Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area. Issued by the Legal and Technical Commission" ISBA/25/LTC/6/Rev.1 (ISA, 2020). A plan of work that addresses the requirements detailed in the draft guidelines has been developed.

NORI has progressed with the development of the scoping studies on the assumption that all of the detailed recommendations within this document will carry through to the final recommendations for the guidance of contractors.

The LTC has recommended seven key areas of information for the development of EIAs. These are physical oceanography, chemical oceanography, sediment properties, biological communities, bioturbation, sedimentation, and geological properties. These form the key investigation topics for surveys within the Area, including NORI Area D.

17.1.1 Role of sponsoring state

As sponsoring state, Nauru has a responsibility to ensure that NORI's activities in the international seabed area are carried out in conformity with Part XI of UNCLOS.

NORI is regulated by Nauru's International Seabed Minerals Act 2015 ("Nauru Act"), which requires NORI to, amongst other things, "*apply the Precautionary Principle, and employ best environmental practice in accordance with prevailing international standards in order to avoid, mitigate or remedy adverse effects of Seabed Mineral Activities on the Marine Environment*".

The Nauru Seabed Minerals Authority, established under the Nauru Act, has a number of functions including to, *inter alia*:

- develop policies and institutional arrangements for the purpose of regulating and monitoring the development of seabed minerals in the international seabed area;
- develop standards and guidelines for Seabed Mineral Activities;
- conduct due diligence enquiries into Sponsorship Applicants or Sponsored Parties;
- assist the ISA in its work to establish, monitor, implement and secure compliance with the Rules of the ISA;
- undertake any advisory, supervisory or enforcement activities in relation to Seabed Mineral Activities or the protection of the Marine Environment, insofar as this is required in addition to the ISA's work in order for Nauru to meet its obligations under the UNCLOS as a Sponsoring State;

17.1.2 Compliance status

At the effective date of this report, NORI is in compliance with its exploration contract. NORI is required to submit 5-year work plans which it reports on annually to the ISA. Every 5 years the ISA and NORI review the work completed in the past 5 years. NORI then develops and submits a new 5-year work plan.

NORI has now commenced the exploitation permitting process. In addition to key engineering facets of the project such as designing the nodule collector and the dewatering facility, it is also planning and undertaking the following tasks:

- Characterising nodule mineralisation.
- Characterising the nature of the seabed, water column and biology.
- Conducting environmental baseline studies and impact assessments.
- Characterising the nature of any materials returned to the environment.
- Developing oceanographic and physical information to inform models (e.g., sediment plume models).
- Developing other plans, including the master environmental management plan (EMP) and the various subordinate plans.

17.2 Previous environmental studies

Historically, a significant amount of technical work has been undertaken within the CCZ by the Pioneer Investors. Each has developed work programs for their specific part of the Area with some cooperative campaigns undertaken where investigative work has been undertaken on multiple parts of the Area. In the last five to ten years there has been a rapid increase in the technical work undertaken within the CCZ. This work, which has included oceanography, seabed geology and geochemistry, and biological studies, has led to a rapid increase in independent published scientific studies based upon research from the technical studies carried out within the CCZ.

Examples of recent campaigns undertaken by other contractors and institutional research campaigns include:

- RV Sonne cruise SO239 (11 March 2015 to 30 April 2015), which carried out work to examine biological characteristics, genetics and geochemistry across a productivity gradient in the CCZ. The cruise visited six working areas in four ISA contractor areas (BGR, IOM, DEME, Ifremer) and the Area of Particular Environmental Interest (APEI) number 3, located to the north of NORI Area D. The IOM and BGR Areas are immediately adjacent to NORI Area D.
- RV Sonne cruise SO240 (3 May 2015 to 16 June 2015) was undertaken to examine low temperature fluid circulation in sediments. The work included seismic surveys, heat flow studies, pore-water, sediment and nodule sampling.
- UK Seabed Resources Ltd (UKSR) holds two licenses, one of these (UK-1) is located to the east of NORI Area D at the edge of the CCZ. UKSR funded two environmental baseline research cruises as part of the ABYSSLINE program in 2013 (AB01) and 2015 (AB02). AB02 was part-funded by Ocean Minerals Singapore (OMS), the Singapore-sponsored contractor for polymetallic nodules, and also visited OMS licence area as well as APEI-4, to the North.
- The RRS James Cook undertook a cruise (JC120) over 15 April to 19 May 2015 to undertake work at the north east APEI within the CCZ. The cruise was part of the Managing Impacts of Deep-seA reSource exploitation (MIDAS) European Union Framework Programme 7 Project, which was jointly funded by the Natural Environment Research Council.

Other EIS documents have also been completed for proposed nodule mining activities and submitted to the ISA. These include:

- Global Sea Mineral Resources (GSR) in 2018 for the development of a pre-prototype collector vehicle equipped with a launch and recovery system planned to be deployed and trialled in the GSR Contract Area in the Clarion-Clipperton Fracture Zone
  (NE Pacific Ocean)

- The German Federal Institute for Geosciences and Natural Resources (BGR) in 2018 for the testing of a pre-prototype manganese nodule collector vehicle in the Eastern German license area (Clarion-Clipperton Zone); and

- The Government of India's Ministry of Earth Sciences (MoES) in 2020 for a polymetallic-nodule collector pre-prototype deep-sea mining machine in the Indian Contract area of the Central Indian Ocean Basin.

NORI has conducted ten off-shore exploration campaigns in the CCZ between the granting of its exploration license in 2011 and the end of 2020. These have focussed on quantification of the mineral resource, with environmental studies included opportunistically, as follows:

- Campaign 1 in 2012 to NORI Areas C and D in the eastern part of the CCZ. Extensive multibeam geophysical surveying of the seafloor and bulk sampling was conducted. Approximately 4.5 t of nodules were recovered from the seafloor and evidenced by video footage.

- Campaign 2 in 2013 to NORI Areas A and B in the central part of the CCZ. Multibeam geophysical surveying of the seafloor along with recovery of approximately 270 kg of nodules from NORI Areas A and B. (collaboration with TOML). The 2012 and 2013 campaigns had a geological focus and the biological/environmental work carried out by NORI was opportunistic.

- Campaign 3 (26/04/18 to 5/06/18). The field work within NORI Area D included sampling to support environmental studies and to undertake geotechnical studies to inform collector vehicle and riser design, collect high-resolution imagery and environmental baseline studies. A total of 2,286 km of AUV data were collected that include potential reserve areas and camera traverses at 3 km line spacing to investigate nodule abundance and biota. Forty-five (45) box cores collected, with 35 used for environmental work. This included recovery of 239 nodule biota specimens, 62 megafauna (>20 mm) specimens, macrofaunal infauna (>0.25 mm) samples sieved from sediment to depth of 100 mm. Sediments were also collected for geochemistry.

- Campaign 6A (19/08/19 to 1/10/19). Seafloor sediment (box core) sampling for biota and sediment chemistry.

- Campaign 6B (22/11/19 to 21/12/19). Seafloor sediment sampling for biota and sediment chemistry.

- Campaign 4A (2/10/19 to 23/10/19). Deployment of oceanographic moorings and water quality investigations.

- Campaign 4B (6/01/20 to 4/02/20) – Bulk sampling and first stage of habitat disturbance studies.

- Campaign 4C (5/02/20 to 16/03/20) – Bulk sampling and first stage of habitat disturbance studies.

- Campaign 4D (16/06/20 to 15/07/20) – Mooring maintenance and data collection.

- Campaign 5A (16/01/20 to 30/12/2020) - Benthic biology and sediment geochemistry studies.

The availability of the vessel Pacific Constructor, operated by Ocean Infinity in NORI Area D provided NORI the opportunity to commission ROV/AUV surveys, from 23/05/20 to 30/05/20, of the collector site, a directly adjacent (expected) plume impact area, PRZ and intermediate control site. This resulted in the acquisition of approximately 250,000 images of the sea floor. This information will be used to start megafauna survey community characterization and inform survey planning for the forthcoming campaigns.

During Campaigns 6A, 6B, and 4A NORI collected a combined total of 8,673 seafloor biological samples and 267 sediment chemistry samples at 204 locations within NORI Area D to provide initial baseline data for the project. During Campaign 4A, NORI deployed three oceanographic moorings for long term measurement of currents through the water column and other parameters such as turbidity and underwater acoustics. Five sites within NORI Area D were also set up for collection of water quality samples and ocean profiling data.

During Campaign 5A over 8000 sediment sub-samples and biological specimens were collected from boxcore and multicore samples retrieved from 46 seabed sites located in the proposed test mining area, plume deposition footprint and the PRZ. The samples are currently awaiting analysis at various analytical laboratories around the world.

The forward work plan over the next two years will involve several off-shore campaigns as follows[22]:

- Campaign 5B (15/01/21 to 280/2/21). Pelagic Biology. Campaign 5b will be supported by an ROV.
- Campaign 5C (1/04/21 to 14/05/21). Sediment analysis, surface biology, benthic biology will continue during this campaign. Campaign 5c will be supported by an ROV.
- Campaign 5D (15/10/21 to 30/11/21). Pelagic biology will continue during this campaign. Campaign 5d will be supported by an ROV.
- Collector Test (1/09/22 to 1/12/22). Disturbance studies before, during and after the Collector Test will be conducted during this campaign.

The combination of past, present and future studies in the CCZ and NORI Area D provides a significant body of information on the nature of the seabed, sampling procedures and potential environmental impacts of collecting nodules from the seafloor that can now be applied to provide the environmental information required for the ESIA. NORI's studies within the CCZ are being designed to provide data that will be collected using methods that meet international best practices. This will allow comparison with other CCZ technical studies and provide data that can be utilised by other parties. The ISA has hosted workshops for contractors with the aim of standardising methodologies.

NORI has committed to operation in accordance with the following international standards and best practices during the conduct of the ESIA:

- EPA WA (2016). Technical Guidance: Environmental Impact Assessment of Marine Dredging Proposals. Environmental Protection Authority, Perth, Western Australia. https://www.epa.wa.gov.au/policies-guidance/technical-guidance-environmental.
- IEC /ISO 31010 Risk Management Risk Assessment Techniques. https://www.iso.org/standard/51073.html.
- IFC (2013) Good Practice Handbook Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets. International Finance Corporation. https://www.ifc.org.

22 Schedules are subject to revision depending on COVID-19 situation and other factors

- MCA (2015). Cumulative Environmental Impact Assessment Industry Guide – Minerals Council of Australia. https://minerals.org.au/cumulative-impact-assessment.
- Rio Tinto. 2008a. Rio Tinto and biodiversity: Achieving results on the ground. Rio Tinto, London and Melbourne. Unpublished document available at: www. riotinto.com/documents/Reports Publications/ RTBidoversitystrategyfinal.pdf.
- Standards Australia. (2009). Risk management: Principles and guidelines (AS/NZS ISO 31000:2009). Retrieved from http://standards.org.au.
- World Bank (2006) Environmental Assessment Sourcebook. Update Number 17. http://documents.worldbank.org.

All the data collected during the campaigns will be submitted to the ISA DeepData database and will be available to other contractors and researchers with interests in the CCZ.

17.3 Seabed physical environment

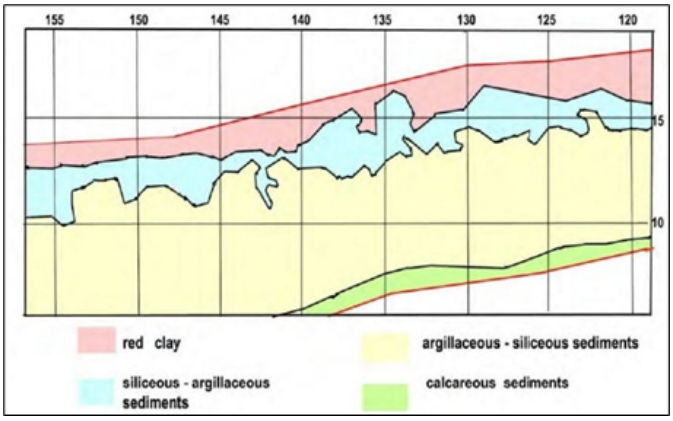
Sediment physical characteristics and geochemistry are important as sediments are disturbed during manganese nodule collection. Composition of sediments and sediment pore water has the potential to influence the natural environmental characteristics, principally water quality and potentially the flux of specific elements mobilised during this process. A range of studies associated with various Contract Areas have examined seabed cores and sediments and undertaken geophysical surveys.

As a result of a workshop conducted in May 2003, ISA developed a model of the geological environment within the CCZ (ISA, 2010). The CCZ geological setting has also been described in various ISA reports and Juan et al. (2018). The nature of sediments has been described by ISA (2010) and Halbach and Abrams (2013).

The detailed bathymetric data indicates that the key features are NNW orientated hills and valleys with relief in the order of a few hundred metres, a flat plain in the south-east of the Area and a series of volcanic cones mostly in the southern part of the Area. This relief will influence the distribution of benthic communities within the area.

Kazmin (2009) summarised that the CCZ is characterised by latitudinal distribution of sediment types in relation to climatic and biological zonation at the time of deposition. From the north to south there are red deep-sea clays, then argillaceous radiolarian ooze (siliceous clay), and then carbonaceous ooze (in the south) Figure 17.1.

Figure 17.1 Simplified surface sediment facies in the CCZ



Source: Kazmin 2009 based on Yuzmorgeologiya (2002)

17.4 Sediment geochemistry and composition

ISA (2010) summarised the characteristics of the key sediment groups identifying the key lithic and authigenic components. Sediments are considered low in total organic carbon (TOC) reflecting the surface primary productivity. Halbach & Abrams (2013) included a summary of sediment elemental analysis undertaken in areas adjacent to NORI Area D. Studies to date do not systematically include all key environmentally significant elements. Studies reported by Mewes et al (2014), De Smit et al. (2017), Volz et al. (2018) and Simon-Lledo et al. (2019) for adjacent part of the Area, provide information on grain size (site mean mud content up to 92.6%) and TOC content (0.2% (APEI3) to 0.5% (GSR and IOM Area)). TOC is lower below the surface of the sediments.

Studies have been carried out in the CCZ that examined sediment pore waters. Mewes et al. (2014) and Volz et al. (2018) reported on pore water chemistry (oxygen, manganese and nitrate) in sediments from a number of nearby Contract Areas including the BGR and IOM areas near NORI Area D.

During NORI Campaign 3, sediment samples of 100 mm diameter were taken from 31 box cores, in most cases at three depths (0–10 mm, 10–50 mm and 50–100 mm). Subsamples were frozen until analysed. A range of analysis were undertaken including:

- Total inorganic carbon, total organic carbon, and chlorophyll-a.
- Total phosphorus and soluble nitrite and nitrate.
- A range of total element analyses in sediment, including several environmentally significant elements.

Sediments sampled in the 2018 campaign were muds, classified as clay or calcareous clay. Cumulative particle sizes were all: <250 µm; 73–99% <32 µm and 13-88% <2 µm (defined as clay in the assessment).

Several elements (e.g., cadmium, copper, mercury and nickel) had concentrations higher than the ANZECC (2018) sediment quality guidelines. The concentrations of elements such as copper and nickel are similar to those measured in other parts of the Area in the east and middle of the CCZ (refer review by Halbach & Abram (2013).

NORI (2020b) collected additional sediment samples for chemical analysis during Campaigns 6a and 6b with samples taken from the 0 to 10 cm layer of each pushcore (10 cm in diameter). At the time of writing, sediment samples are being analysed for the physical and chemical characteristics.

17.5 Climate

Refer to Section 5.2.

17.6 Large-scale oceanography

The proposed nodule collection involves activities that will occur through the full water column, from the production support vessels (PSVs) at the surface to the collector vehicles on the seafloor. The RALS will convey the nodules from the seabed to the PSV, although the enclosed nature of the riser will separate nodules from the environment for most of the water column. Therefore, it is important to understand the physical oceanographic characteristics that will affect both the operational activities and the environmental impacts of those activities to the receiving marine environment.

The ocean is not uniform from surface to seafloor but stratified according to temperature, salinity and density gradients and oxygen levels. In clear oceanic conditions, light penetration is sufficient to support photosynthesis by phytoplankton to a depth between 100 and 200 m but is extinguished altogether below 1000 m. Water movements are also affected by tides, currents, and circulation on local and ocean-wide scales, as well as precipitation and wind. The depths and intensities of these layers are not constant but varies daily and seasonally, so frequent profiling is important to understand the extent of these natural variations.

17.6.1 Oceanic currents in NORI Area D

Upper ocean circulation within the CCZ is affected by trade winds and a system of large-scale currents (Gill 1982 in Demidova 1999). The north-easterly Trade Winds generate a westerly moving surface current, with waves having a height of 1 to 2 m. This is a broad current with an average speed of about 10 – 20 cm/s, decreasing with depth (NOAA 1981, ISA 2001, Tilot, 2006, GRS 2018). The surface currents extend down to a maximum depth of 500 m and form part of the North Equatorial Current directed towards the West. At intermediate depths (300-4800 m), the currents are weak (mean 0.08 knots [~4 cm/s]) and variable in direction (Tilot 2006). Three dynamic seafloor current regimes are evidenced in the region Morgan et al. (1999) and Demidova (1999):

- Calm periods, characterised by minimal current speeds (0 to 3 cm/s), moderate to low variance, and low tidal activity with time intervals lasting about 11 days.
- Intermediate, mostly inertial-tidal periods characterised by the alteration of current speed (0 to 5 or 6 cm/s) and velocity with a corresponding increase in the variance of data.
- Active periods, associated with an initial sharp increase in current speed, which can maintain relatively stable speeds to produce 24-hour means of as much as 8 cm/s (Demidova & Kontar 1989), and 1 hour means of between 13 and 15 cm/s (Hayes 1979). These events can be termed “benthic storms”, which are regular, but not periodic, increases in the current speed lasting from about one or two weeks to five or six weeks.

The general scheme of deep oceanic circulation in the Pacific Ocean is related to the movement of cold and dense waters of Antarctic origin with high salinity and oxygen concentrations (Jaun et al., 2018) and the general direction of near-bottom currents is thought to be dominated by the flow of the Antarctic Bottom Water (ABW) (or Lower Circumpolar Water (LCPW)) from south to the north-east (Demidova 1999).

There are also suggestions from multi-beam bathymetric evidence that benthic currents in the CCZ may control movement and deposition of sediments along the seafloor valleys (Jaun et al. 2018; Morgan et al. 1999), with intermittent benthic storms considered capable of generating depositional and erosional features on the Pacific abyssal plains.

Overall, bottom current measurements at various locations through the CCZ show consistently low average near seabed current velocities (around 40–50 mm/sec). Site specific measurement of currents within NORI Area D in forthcoming campaigns is designed to characterise regional current velocity data through the water column to provide data to assist in sediment transport modelling (from disturbance and or discharge).

17.6.2 Oceanographic studies

Physical oceanographical studies in water depths of the CCZ are complex and necessarily long term (e.g., two to three years) to evaluate likely variations over time and location. During 2019, NORI initiated a long term oceanographic, sediment and benthic data collection program from Campaigns 6a and 6b, and deployment of three oceanographic moorings in Campaign 4A (NORI 2020b). The mooring locations and the water quality and Conductivity – Temperature - Density (CTD) profiling locations are shown in Figure 17.2. A diagram of the mooring arrays and sensor configuration is shown in Figure 17.3.

Scientific instrumentation attached to the moorings included:

- CTD, turbidity, transmissivity, and dissolved oxygen sensors.
- Acoustic Doppler Current Profilers (ADCPs) and Doppler Velocity Samplers (DVS).
- Acoustic hydrophone.
- Sediment traps.
- Seafloor camera system.

The data will be continuously recorded and accrue with each annual data recovery, equipment servicing and redeployment cycle, until October 2022.

Figure 17.2 NORI Area D mooring and water quality sampling locations

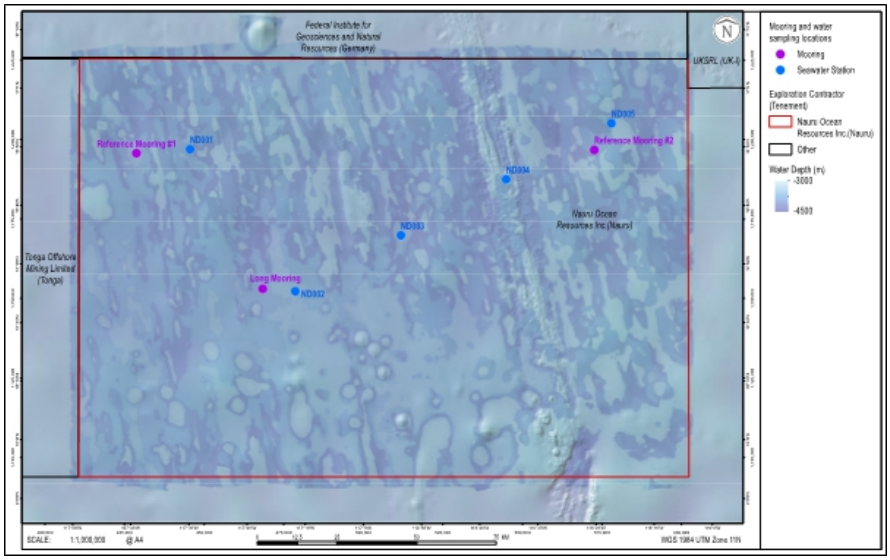
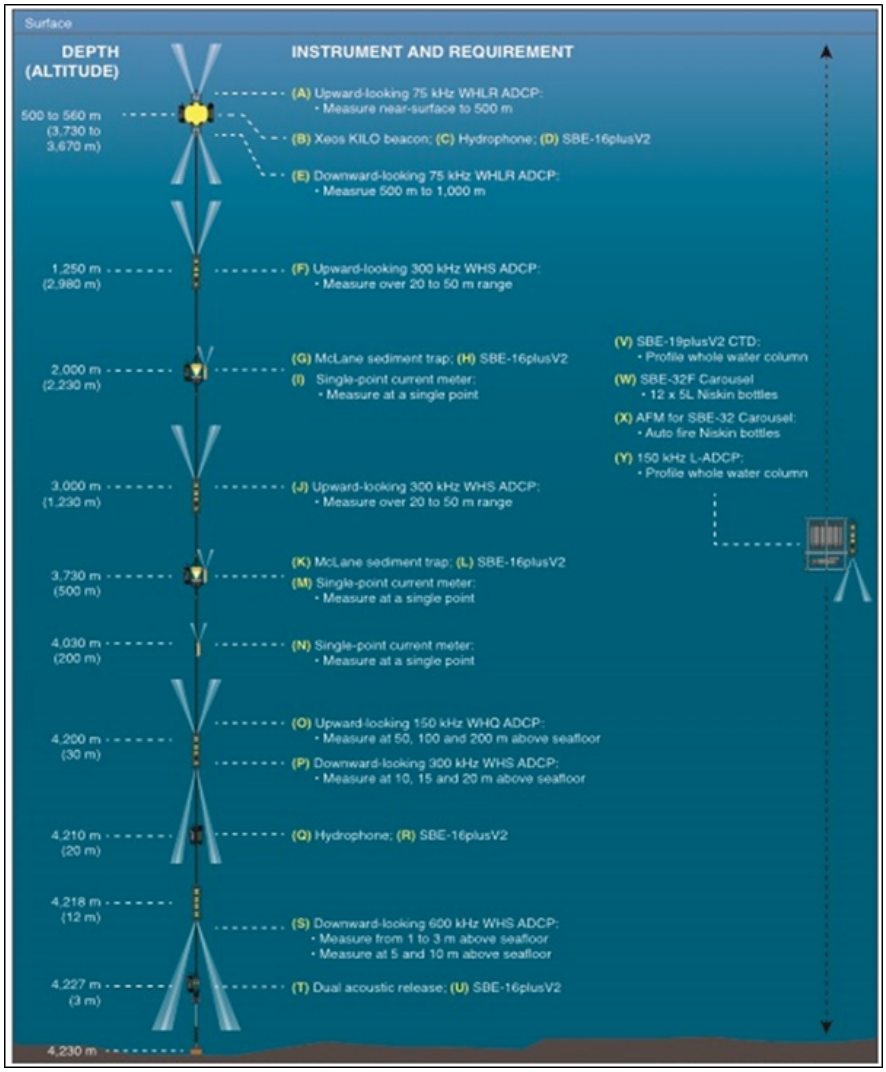


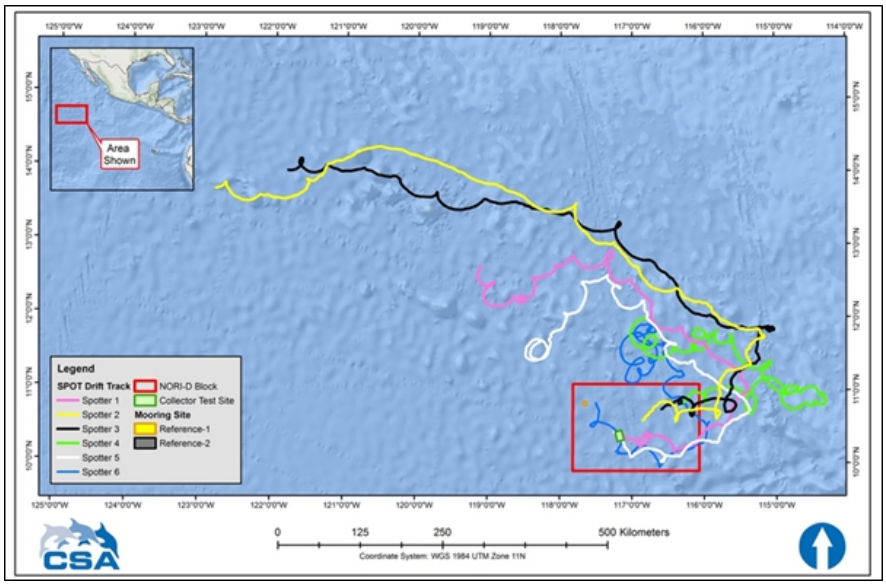
Figure 17.3 Equipment configuration on the mooring array



17.6.2.1 Surface currents

During Campaign 4A, six SOFAR surface drifters were deployed from within the NORI Area D Area. Initially, all drifted south-eastward to eastward across NORI Area D, with times of calm periods (circular drifting) until late-October 2019 when they left the block boundary, then drifted north-westward, with a net westerly displacement towards the central Pacific Ocean (Figure 17.4). The SOFAR spotters recorded wind speeds of between 3–19 knots and wave heights of between 1.4–2.8 m during their drift through the NORI Area D.

Figure 17.4 Surface currents recorded by SOFAR drifters



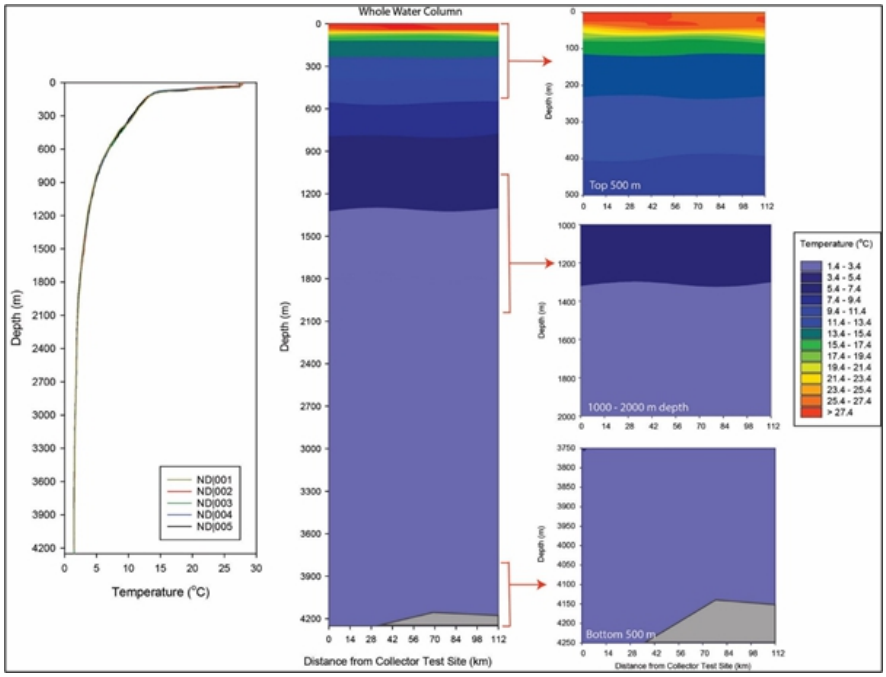
17.6.2.2 Water column vertical structure

Profiles of temperature, salinity, dissolved oxygen (DO), pH, turbidity transmissivity, and fluorescence measured in NORI Area D during Campaign 4A at each seawater sampling station are described below. Those for temperature, salinity, DO and pH also show interpolated cross-sections diagonally across the NORI AREA D block from the Collector Test Site (ND|002) to the Reference 2 location (ND|005). Overall, these profiles are consistent with open ocean conditions. NORI's ongoing profiling of water column characteristics and faunal components will be instrumental for assessment of depths of discharge of riser water and selection of methods of achieving lowest environmental impact.

Figure 17.5 shows the temperature profile, typical of autumn conditions for deep water areas of the tropical north Pacific Ocean. There is a thin surface mixed layer (~50 m from surface) of near homogenous temperature (~27°C) formed by the mixing action of wind and waves, below which is the top of the thermocline, where temperatures drop sharply (~15°C) through the first 100 m of the water column. Seawater temperatures continue to decrease from 15°C to 2°C through the next 2,000 m and remain relatively stable and cold (1.5°C to 2°C) down to the seafloor. This pattern is consistent between the sampling sites.

Figure 17.6 shows the corresponding salinity profile within the water column, which range from approximately 33.5‰ in surface waters to 34.5‰ at the seafloor, with a halocline occurring in the upper 100 m of the water column. The maximum salinity (~34.75‰) was observed at approximately 100 m from which it gradually decreases and stabilizes through the water column to the seafloor. A slight depression in salinity was observed in the upper mesopelagic, coincident with the core of the oxygen minimum zone.

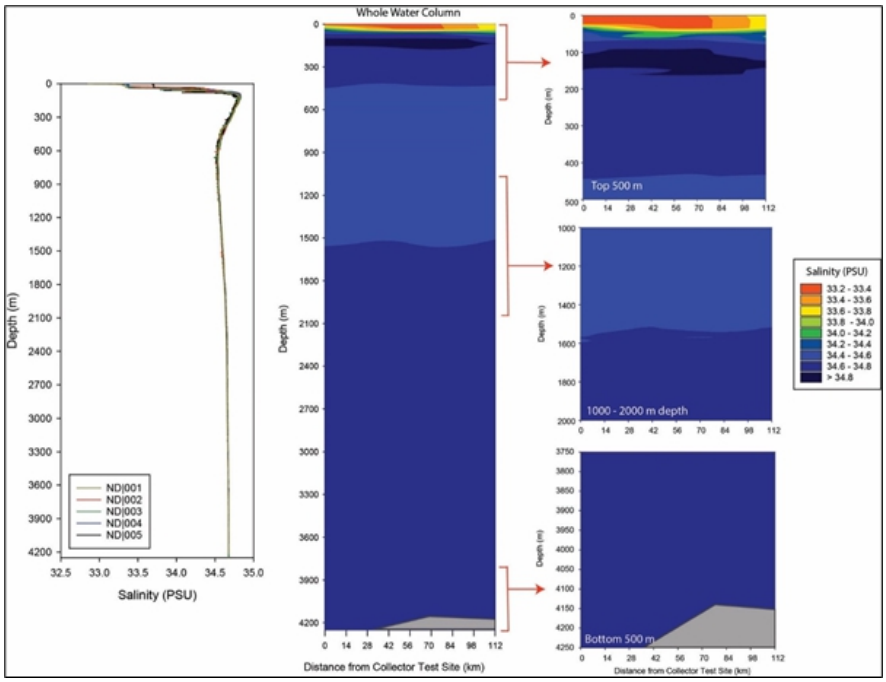
Figure 17.5 Temperature (°C) profile of NORI Area D during Campaign 4A



Note: Temperature (°C) profile of NORI Area D during Campaign 4A at each seawater sampling station (left). Interpolated cross-section of temperature diagonally across NORI Area D from the Collector Test Site (ND|002) to the Reference 2 location (ND|005) (right).

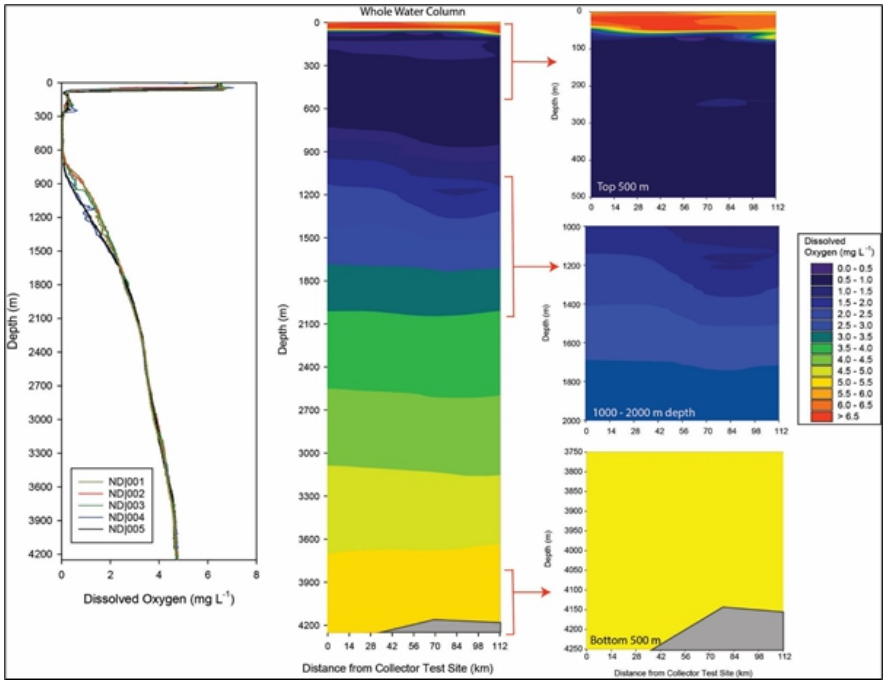
Figure 17.7 shows the profile of dissolved oxygen concentration that is typical for deep oceanic waters. There are high levels (6 to 7 mg/L) in the surface layers, where it is maintained from atmospheric and photosynthetic diffusion. There is an oxygen minimum zone, between 100 and 700 m, where respiration of oxygen by organisms exceeds renewal, resulting in very low oxygen concentrations (i.e., <0.5 mg/L). Below depths of 700 m, the dissolved oxygen concentration gradually increases to approximately 4.5 mg/L at the seafloor, with some slight differences between sites in the depth range of 700 to 1800 m. The source of this oxygen is generally believed to be from influx of oxygen rich waters from polar regions into the deeper parts of the ocean.

Figure 17.6 Salinity (psu) profile of NORI Area D during Campaign 4A



Note: Salinity (psu) profile of NORI Area D during Campaign 4A at each seawater sampling station (Left). Interpolated cross-section of salinity diagonally across NORI Area D from the Collector Test Site (ND|002) to the Reference 2 location (ND|005) (right).

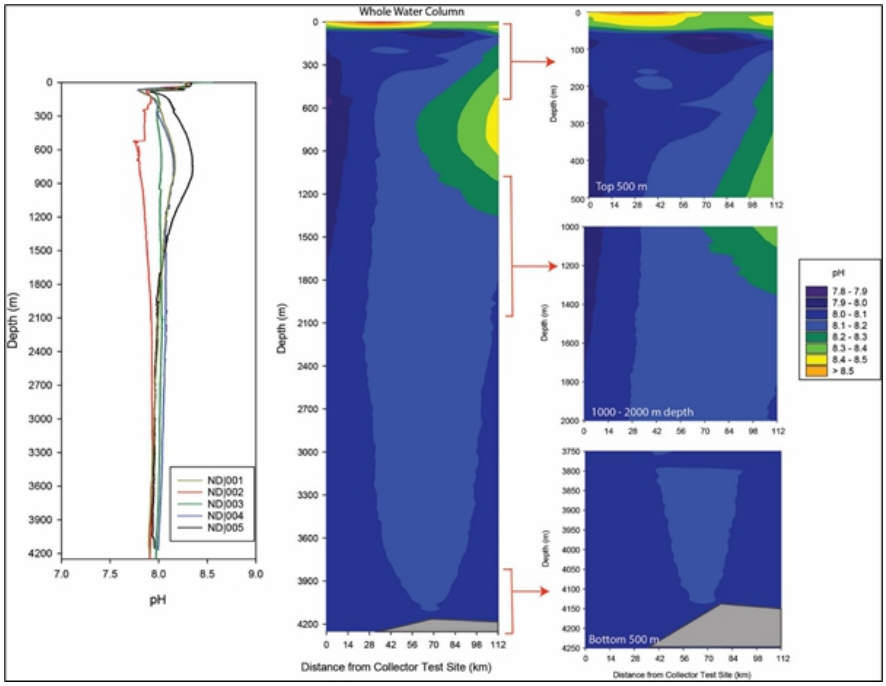
Figure 17.7 Dissolved oxygen (mg L-1) profile of NORI Area D during Campaign 4A



Note: Dissolved oxygen (mg L^{-1}) profile of NORI Area D during Campaign 4A at each seawater sampling station (Left) and interpolated cross-section of dissolved oxygen diagonally across NORI Area D from the Collector Test Site (ND|002) to the Reference 2 location (ND|005) (right).

Seawater pH values were generally uniform among the stations in the upper 100 m of the water column and between 2,000 m to the seafloor Figure 17.8 but showed some variability within the depth range of the oxygen minimum zone and showed a slight increase from west to northeast.

Figure 17.8 pH profile of NORI Area D during Campaign 4A

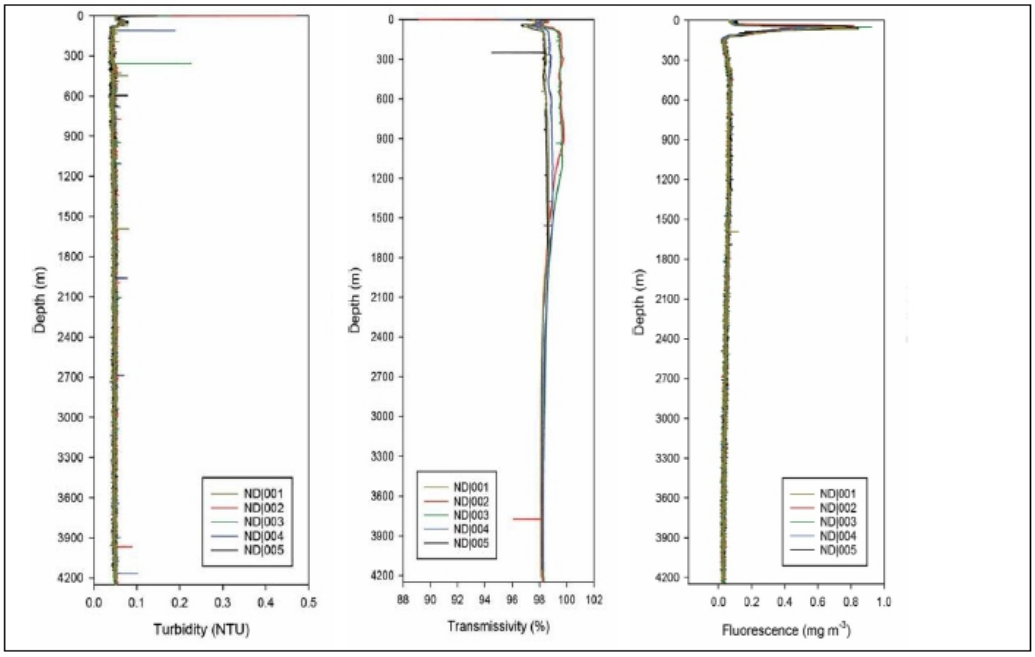


Note: pH profile of NORI Area D during Campaign 4A at each seawater sampling station (Left) and interpolated cross-section of pH diagonally across NORI Area D from the Collector Test Site (ND|002) to the Reference 2 location (ND|005) (right).

17.6.2.3 Suspended sediments, transmissivity and fluorescence

Turbidity and transmissivity (Figure 17.9) are fairly constant through the water column. Both measurements indicate that there is very little particle suspension at any depth, which is typical for open ocean systems remote from terrigenous inputs or upwelling regions. Fluorescence from chlorophyll showed that the deep chlorophyll maximum is found at a water depth of approximately 50 to 60 m depth, which coincides with the start of the oxygen minimum zone within the region. Fluorescence then rapidly decreased with depth to below detection through the remainder of the water column due to light limitation of growth.

Figure 17.9 Profiles of turbidity (NTU) (Left); percent transmissivity (centre) and fluorescence (mg m-3 Right), in NORI Area D during Campaign 4A



17.6.2.4 Water column chemistry

Sampling and measurements of water column chemistry included nutrients (nitrogen, phosphorus and silica), trace elements (metals and metalloids) and other major constituents was conducted at each of the five water quality sites in NORI Area D during Campaign 4A. The results available to date are tabulated in NORI Annual Report for 2019 (NORI 2020b) and, where possible, compared with Pacific Ocean reference concentrations (World Ocean Atlas WOA2018). Planned further sampling campaigns during the ESIA study will provide progressively improved robustness of baseline characterization of water quality parameters and variations (e.g., with season) or consistent differences, if any, with results from other studies within the CCZ.

Nutrient concentrations throughout the water column in NORI Area D were generally similar to nutrient concentrations, vertical profile trends, variability, and nutrient maxima reported within the BGR License Area and to those reported within the generalized
deep water Pacific Ocean (Johnson et al., 2020).

17.6.2.5 Sediment chemistry

During NORI AREA D Campaign 3, opportunistic seafloor sediment sampling for biological and EIA-related geochemical parameters was undertaken at 45 sites using box corers. Samples for sediment geochemical characterisation were obtained at 31 of these sites. In 2019, during NORI Campaigns 6A and 6B, NORI collected a further 267 samples from 204 sediment chemistry sites. The locations of all sampling sites are shown in Figure 7.32. The sediment samples were sent to ALS Environmental Laboratory in Kelso, Washington, USA for analysis, which is accredited by the State of Washington Department of Ecology. At the time of writing, sediments are being analysed for:

- Moisture content (to allow results to be expressed on a dry weight basis).
- Total carbon (TC), total organic carbon (TOC) and total inorganic carbon (TIC).

- Total organic matter.
- Alkalinity (after a 5:1 deionised water extraction).
- Chlorophyll-a and algal biomass.
- Total phosphorus.
- Nitrate-N and nitrite-N (after a 10:1 deionised water extraction).
- Total metals (aluminium, antimony, arsenic, boron, cadmium, calcium, chromium, chromium (VI), cobalt, copper, iron, mercury, lead, magnesium, nickel, selenium, silver, tellurium, thallium, uranium, vanadium, zinc).
- Silicon, silicon dioxide (by calculation).

Results for total metals have been compared against the Screening Quick Reference Tables (SQuiRTs) published by NOAA (Buchman, 2008), and the Australian sediment quality guidelines (Simpson and Batley, 2016). The SQuiRTs for inorganic variables in marine sediments include screening values ranging from nearly non-toxic to toxic levels, both the 'Effects Range-Low' (ERL) values and the 'Effects Range-Median' (ERM) values. All results for nickel concentrations and most copper concentrations exceeded the ERM range, with a maximum observed value up to ten times the EML for nickel and five times higher for copper. The majority of results for mercury and zinc were similar to, or less than the ERL range, and other metals were lower again or below the method reporting limit. The ESIA will need to assess the potential for remobilization of metals from the sediment during mining to affect the overlying water quality.

17.7 Ocean ecosystems

17.7.1 Overview of ecosystem compartments

The ISA draft guidelines (2020) recommend that all recognized size classes of biota from microbial (e.g., bacteria) to megafauna (organisms from 2 cm to whales) to be characterised in each zone of potential occurrence, from the atmosphere to the deep ocean seafloor. This section of the IA provides an overview of the expected faunal composition of each of these habitat compartments. Much is drawn from literature sources but supplemented with initial findings from the three campaigns completed in 2019/2020 in NORI Area D. Information to meet all requirements of the ESIA is expected to be available by the completion of campaigns 5a to 5d and the Collector Test at the end of 2022. The key features of the epipelagic, mesopelagic and bathypelagic zones of the water column and faunal components are summarised below.

The epipelagic zone (0–200 m) comprises the near-surface, well-lit environment that includes the surface mixed layer, depth to thermocline and euphotic zone. This is the zone of primary production by phytoplankton, and the dependent food chains from zooplankton and micronekton to larger invertebrates, fish from baitfish to schooling tuna and sharks, marine turtles and mammals. Only within this zone is light sufficient for photosynthesis (by the phytoplankton). Downward transport of dead organisms and particulate organic matter contributes to the food chains in the deeper layers of the water column. However, the surface waters of the open ocean outside of the influence terrestrial run-off are oligotrophic (i.e., nutrient limited, low levels of primary production).

The mesopelagic zone (200–1,000 m) extends down to the lower limit of light penetration, where temperatures decline, and minimum dissolved oxygen levels are encountered. Bioluminescence plays an important ecological role for the many species of fish and invertebrates (e.g., shrimps and squids) and gelatinous organisms (e.g., jellyfishes). These communities also provide a significant proportion of the diets of tuna and other large species that dive into the mesopelagic zone to feed during the day or encounter through vertical migration of the plankton and other micronekton (small fish/invertebrates) into the epipelagic zone during night-time (Bertrand et al 2002).

The bathypelagic zone (>1,000 m) is characterized by the complete absence of light, very low temperature, low nutrients, low productivity, and dissolved oxygen concentrations that are intermediate between the oxygen minimum zone and epipelagic zone. Organisms living in this zone are mostly dependent on food descending from the upper photic zones as sinking marine snow (Polunin et al., 2001) and intermittent falling of large dead animals such as whales. The main characteristics of the abyssal ecosystems (see Smith 1999) are described as follows.

- Low productivity: Generally, biomass declines exponentially with depth (Marshall 1979, Herring 2002). Food availability on the CCZ seafloor is limited by a low flux of particulate organic carbon from the surface and low abundance of life at the abyssal seafloor, and flux from epipelagic zone may be seasonal.

- Low physical energy: Currents at the seabed are slow. Sediment erosion and redeposition from physical processes are uncommon, or intermittent as benthic storms. There is evidence from the eastern CCZ that on geological time scales, and possibly annually, re-suspension and sediment transport events may be occurring (Jaun et al. 2018; Morgan et al. 1999; Smith 1999).

- High species diversity: despite low biomass, diversity at local habitat and regional scales can be high and has been subject of study through CCZ with investigation of specific animal groups at both organism and genetic level. Diversity and genetic preservation are identified as key issues (by the ISA) in managing mineral development within the CCZ. This has led to the establishment of areas of particular interest (APEls) within the CCZ, each with an area of 400 km by 400 km, which are intended to remain protected from the impacts of nodule collection (ISA 2011a, 2012b). In total, these areas contribute about 30% of the CCZ (Smith et al, 2010).

- Large and continuous habitat but with geographical variations in relation to seabed depth, topography (presence of seamounts and other features), geological variations (e.g., presence of lava) and biological variability.

17.7.2 Size classes of organisms

The following sections provide brief descriptions of some of the characteristic organisms found within each of the zones and habitats. The existing information, together with the results of the data currently being examined from the 2018 and 2019 campaigns and the proposed studies over the next four campaigns is expected to provide the required robust baseline data for quantitative assessment and comparison of the faunal populations within and between NORI Area D and other areas of the CCZ.

17.7.2.1 Benthic megafauna

Megafauna (>2 cm) within the CCZ include mobile and sessile organisms, mostly invertebrates that occur on soft and hard substrates. The epifaunal groups include those living at the sediment-water interface such as gastropods, crabs, sea urchins, as opposed to those living within the sediments such as the larger polychaete worms and burrowing crustaceans. Larger and more mobile species living close to the seafloor within the CCZ are likely to include omnivorous fish (primarily rattails), cephalopods (octopus, squid), scavenging amphipods, deep-sea shrimp, and large deposit feeders such as sea cucumber along with suspension feeding sponges and anemones.

Comparative information on abundance and diversity from other megafaunal studies in adjacent research or Contract Areas includes Tilot (2006), Stoyanova (2012), Amon et al. (2016; 2017), Simon-Lledo et al. (2019), and other international benthic research projects in the UK polymetallic nodule mining claim in the CCZ, such as ABYSSLINE http://abyssline.info/. The ISA has also created an Atlas of Abyssal Megafauna Morphotypes of the Clarion-Clipperton Fracture Zone (http://ccfzatlas.com/).

17.7.2.2 Benthic macrofauna

Macrofauna (>300µm <2 cm) include the organisms that live within and on the sediment and the semi-liquid layer of the sediment-water interface. Polychaete worms comprise 50% to 65% of the macrofauna found in the CCZ, and also crustaceans, echinoderms and bivalve molluscs. Most macrofauna feed on surface deposits. Other studies of sediment macrofauna, for example Yu et al. (2018), examined density and community structure between the areas, including preserve areas, and Janssen et al. (2015) investigated local and regional genetic diversity in isopods and polychaetes across the CCZ to assess connectivity and dispersal.

17.7.2.3 Benthic meiofauna

Meiofauna (>32 to 300 µm) are organisms that occupy the sediment interstitial space or the epibenthic semi-liquid layer at the sediment-water interface. They can also occur on nodule surfaces and other micro-habitat structures. They are ubiquitous and in greater abundance than macrofauna. The main marine taxa include foraminifera, nematode worms, copepods (crustacea), and several other phyla in lesser abundance (Higgins and Thiel, 1988). Due to their abundance, these animals play a key role in carbon cycling in the deep sea and are sufficiently numerous to allow robust statistical monitoring of indices of abundance and diversity over time or between sites in studies of impacts to seabed such as dredging operations (Clarke and Warwick, 1994).

A number of research programmes have sampled the abyssal North Pacific Ocean seafloor and collected data for multiple parameters of interest to biogeochemical modelling efforts. Overall, meiofaunal (63-300 µm) and macrofaunal (300 µm-3 mm) abundances and/or biomass represent the most widely sampled biological parameters in this region, and these data sets also exhibit the greatest consistency in collection methods across field programmes. Preliminary examination of the data indicates that the abundance of these benthic fauna is roughly proportional to the flux of nutrients available in particles settling from the surface (ISA 2010).

17.7.2.4 Benthic microbial communities

Microfauna (biota sized < 32 µm) include bacteria, archaea, protistans, fungi and viruses, which are expected to be present in the CCZ. A number of studies have been undertaken to understand the microbial communities present within sediment in the CCZ. Shulse et al. (2016) and Lindh et al. (2017), using rRNA gene sequencing, found that microbial community composition and diversity varied with habitat type, water column depth, and sediment horizon. Microbial communities in the sediments had the highest diversity, followed by nodules, and then by the water column with less than 1/3 the number of operational taxonomic units in the sediments.

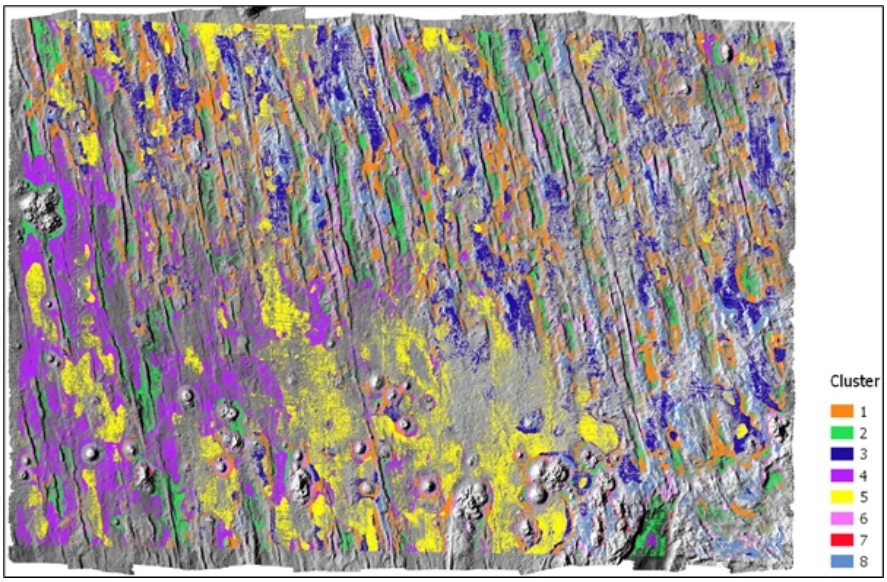
17.7.2.5 Benthic nodule fauna

A key topic for study in the CCZ is the composition of the biological communities associated with seabed nodules, which provide the hard seabed substrate on which sessile organisms can attach. In the absence of nodules, there is relatively little other hard surface that provides substrate for organisms to attach themselves.

A research project by Tilot (2006) studied the distribution of benthic megafauna associated with nodules within the CCZ (NIXO-45, NIXO-41 and ECHO-1) sites. It includes an annotated photographic atlas for each phylum, and inventories, based on a collection of about 200,000 photographs of the ocean floor showing a taxonomic diversity of 240 taxa. Of these, 46 were echinoderms, and cnidaria (e.g., jellyfish and sea anemones) was the most diverse phylum with 59 different taxa. The study used a classification of eight nodule facies, based on nodule sizes, surface features and degree of burial to evaluate relative abundance and composition of fauna, by phylum, and trophic and functional groups from analyses of photographic transects covered by towed and autonomous devices. Suspension-feeders were more abundant that detritus feeders regardless of the facies. The study also analysed spatial heterogeneity in distribution of populations across the eight different facies and facies gradients.

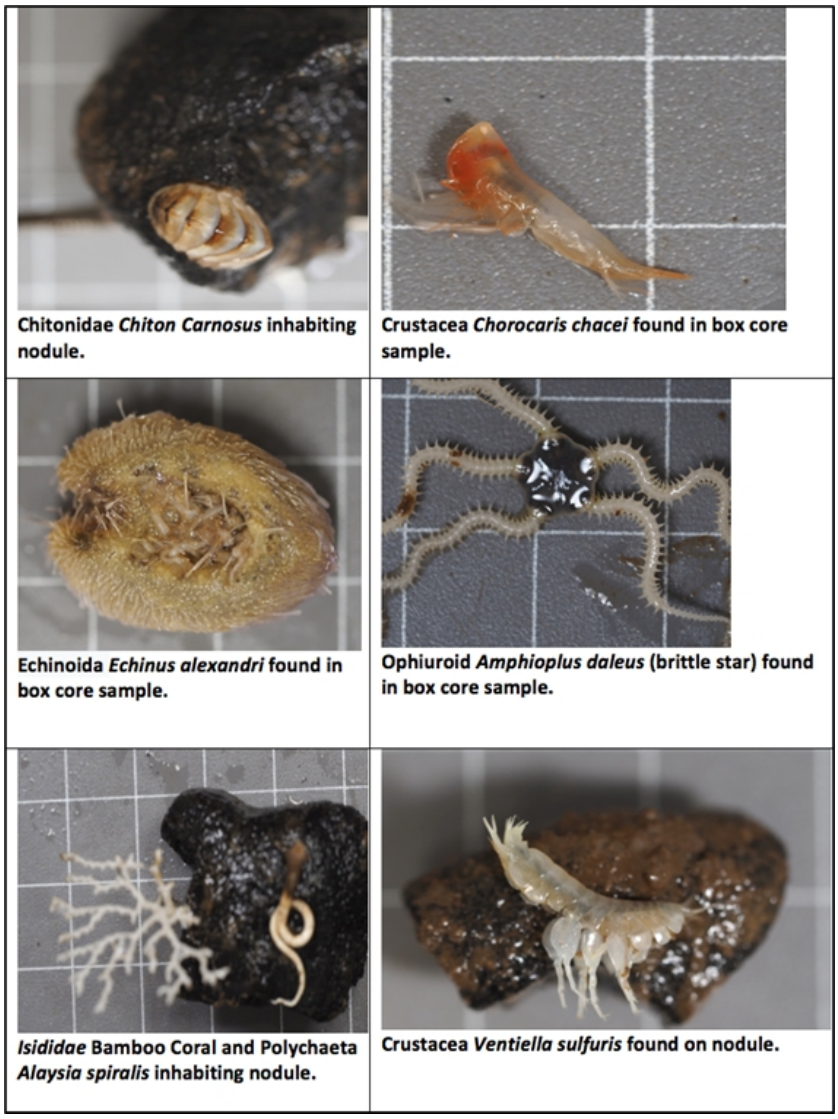
In 2019, NORI completed a habitat mapping project applying a clustering algorithm to NORI Area D data that resulted in an 8-cluster solution classification for geoforms (seamounts, bathymetric highs, bathymetric lows and flat plains), described in NORI (2020b). Within each of these geoforms, key compartments were identified (slopes associated with abyssal hills, depressions within bathymetric lows, seamount sub-features), where biological communities are expected to be distributed according to abiotic type. NORI's existing nodule distribution data is split between three nodule distribution types according to size and sediment gaps between nodules (or percentage cover by nodules). Overlaying the 8-cluster solution geoform classification for each nodule type was then used to determine whether a relationship exists between geoform and nodule distribution type. An example overlay of the eight geoforms for Type 1 nodules is shown in Figure 17.10.

Figure 17.10 Type 1 nodules coloured by their placement within the 8-Cluster geoform map of NORI Area D



Results of the 8-cluster solution geoform classification were available prior to Campaign 6B, which enabled targeting of box core sampling to each of the 8-cluster geoforms. NORI collected 8,673 seafloor biological samples at 204 locations within NORI Area D. Four push-corer subsamples were taken from each box core for analyses of faunal class sizes and sediment chemistry. All samples were preserved using methods appropriate for the taxonomic and eDNA analyses required. Some examples of nodule-attached fauna and sediment megafauna from box core samples are shown in Figure 17.11. Analysis of these samples is yet to take place, however the degree of similarity between the respective eight facies identified in NORI (2020b) and Tilot (2006) will provide valuable comparisons of composition and distribution of nodule fauna over the wider CCZ area.

Figure 17.11 Examples of megafauna from NORI Area D (Note Each scale square is 1x1 cm)



A number of other studies of nodule fauna have also been undertaken in the CCZ that provide background or analogous information and regional context of the types of benthic nodule fauna likely to be observed in NORI Area D, and the role that surface texture and microhabitat heterogeneity of nodules may play in the structure of these communities. These include Amon et al. (2016) Vanreusel et al. (2016), De Smet et al. (2017) Veillette et al. 2007a, 2007b, Thiel et al. (1993) and Mullineaux (1987). Overall, much background information exists on the composition and distribution of nodule-associated fauna of the CCZ to compare and contrast with the findings from NORI Area D.

17.7.2.6 Benthic fish

Benthic fish species and their abundance can be assessed using techniques such as video surveys or video or camera bait stations. Although bait stations attract scavenging species, the method provides valuable information about a section of the fish community present at these depths. Many bathypelagic fish are opportunistic feeders, with large gaping jaws and stomachs adapted to feed on larger prey. Bioluminescence plays a role in feeding, predator evasion, reproduction and communication (Herring 2002). However, there are some more active bathypelagic fish such as families Macrouridae (rattails) and Morridae (cods). The AUV images collected to date, together with those that NORI will collect in the main study program, will provide images of fish present within NORI Area D and for comparison with other literature data for the CCZ.

17.7.2.7 Pelagic micro-organisms

Micro-organisms are found throughout the water column. Due to their size (and the size of their aggregates), they are an easily available substrate for filter feeders and selective feeders such as larval fish. Sorokin et al (1970) estimated that “bacterioplankton” are as important as algae as a primary food substrate. Work on bacterial communities within the UK-1 Area by Shulse et al. (2016) showed that diversity in the water column is lower than diversity in the sediment.

17.7.2.8 Pelagic Phytoplankton

In subtropical sea surface waters, nutrient concentrations are low and phytoplankton populations are sparse (Morgan et al. 1999). Algal productivity is driven by the availability of nutrients in surface waters, which is typically low in areas remote from the influence terrestrial runoff, and levels of light and depth of light penetration. Most publicly available CCZ plankton work appears to have originated from the Deep Ocean Mining Environmental Study (DOMES) sites. DOMES Sites A and B are located to the west of NORI Areas A and B. DOMES Site C is located between NORI Areas A/B and C (see ISA, 2010).

17.7.2.9 Pelagic zooplankton and micronekton

Research on zooplankton and micronekton carried out at the DOMES sites in the 1970s found concentrations to be highest in the upper 150 m, with highest densities of taxa within the upper 100 m of the water column (Morgan et al. 1999). However, many zooplankton only spend part of their time in the surface zone, descending into deeper water of the mesopelagic zone during daytime to escape predators, returning at night to feed on phytoplankton when they are less exposed to visual predators (Castro and Huber 2005). Some patterns of vertical distribution can be more complex with adaptation of species to live within the oxygen minimum zone (Fernandez-Alamo and Farber-Lorda 2006), highlighting the need to understand these processes and potential impacts at different depths within the water column.

17.7.2.10 Pelagic nekton

These include non-commercial species such as squid, lancet fishes, flying fishes, lantern fishes, rat-tail fishes, pelagic shrimp, and euphausiids as well as commercial fish species, such as tuna and billfishes. They are found throughout the Pacific Ocean at tropical and subtropical latitudes. Most of these surface schooling species are highly migratory, and their latitudinal range is seasonal. Many species of sharks are also expected to be found in the CCZ area, inhabiting all zones from surface to the seafloor.

17.7.2.11 Marine mammals, reptiles and birds

Several species of whales are likely to frequent or transit through the CCZ area, including large baleen whales: blue whales, fin whales, sei whales, and the toothed sperm whales. Dolphins such as the Pacific bottlenose and spinner dolphins are also likely to be present. Most sea turtles, particularly the leatherback have worldwide distributions that could transit through the project area.

Given the remote off-shore location of the CCZ, no bird breeding grounds occur at or near the NORI licence areas. However, a range of seabirds may occur in the wider CCZ environment, including those on a migratory pathway, or wandering seabirds, such as albatrosses, shearwaters and petrels.

During the 2019 campaigns, on board observations of marine fauna were made during the time sat NORI Area D and while transiting to and from the site, and this observing and recording program will continue on all NORI's future campaigns. Existing information available from other parts of the CCZ will also be utilised in conjunction with observational seabird research in and adjacent to NORI Area D to build a picture of seabird species present and their occurrence. Seabird observations will also be collated together with the marine mammal observation program.

17.7.3 Ecosystem biodiversity

Biodiversity includes the species and communities within each of the oceanographical zones and topographical habitats described above. It is an important measure of the overall ecosystem health and function, although it has no unifying metric for comparison. NORI's proposed studies are designed to describe the functioning of the CCZ seabed and overlying water column ecosystems, and the role played by different species to make definitive statements about biodiversity impacts in terms of maintenance, or the extent of any reduction or loss.

17.7.4 Ecosystem trophic interaction

Understanding how the components of the ecosystem interact and depend upon each other, through feeding and transfer of carbon is important in being able to understand effects that might occur within an ecosystem when any component of the system is disturbed.

The complexity of deep-water studies requires data on trophic interactions to come from multiple sources (Guenette et al. 2008; Pinkerton et al. 2010; Pinkerton & Bradford-Grieve 2014; Choy et al. 2015, 2017; Drazen & Sutton 2017). The biological dependencies and interactions are complex.

Understanding the ecosystem-scale deep-water trophic interactions within the NORI Area D block will require integration of studies (including trophic model development) undertaken across the CCZ. NORI's proposed sampling methods to be used during the proposed studies will allow for morphological taxonomy, environmental DNA (eDNA), molecular and stable isotope analysis to build up data on overall biodiversity and interactions.

17.7.5 Ecosystem interaction with existing economic activities

The key existing economic activities within the CCZ are the passage of cargo vessels and some fisheries activity.

17.7.5.1 Shipping

Although the NORI licence areas have the potential to overlap with some shipping routes, these do not appear to be major routes and the frequency of vessel passage is envisaged to be low, which is consistent with observations made by other ISA contractors operating in the CCZ.

NORI will require each vessel operating under its control to enter data into the ship's log related to ship sightings and activity within the NORI exploration areas. The draft EIS developed by NOAA for the Ocean Mining Associates CCZ manganese nodule exploration licence stated that only 50 vessel sightings were made over a non-continuous 10-year study period, and of these, only one was a fishing vessel (NOAA, 1984). During the NORI 2018 campaign, only one vessel (a fishing vessel) was seen in six weeks. Adherence to standard maritime navigational protocols and radio communications is expected of all vessels in the vicinity to avoid risks of collision.

17.7.5.2 Fisheries

The CCZ sits within Major Fishing Area Statistical Area 77 of the Food and Agriculture Organisation (FAO http://www.fao.org/fishery/area/Area77/en) of the United Nations, which covers a total surface area of 48.90 million km^2, including the area from 175°W to the west coasts of USA, Mexico and Central America between latitudes 5° and 40° N. Tuna and other larger pelagic fishes are important components of the marine fisheries and widely distributed in Area. The key countries fishing for tuna in Area 77 are Mexico and USA, followed by Venezuela, Japan, Korea, Spain, and other Asian nations. Over the period 2012 to 2018, total fish capture (including fish, crustaceans and molluscs) for the Eastern Central Pacific (Area 77) has ranged between 1.65 and 2.05 million tonnes (Food and Agriculture Organisation, 2018).

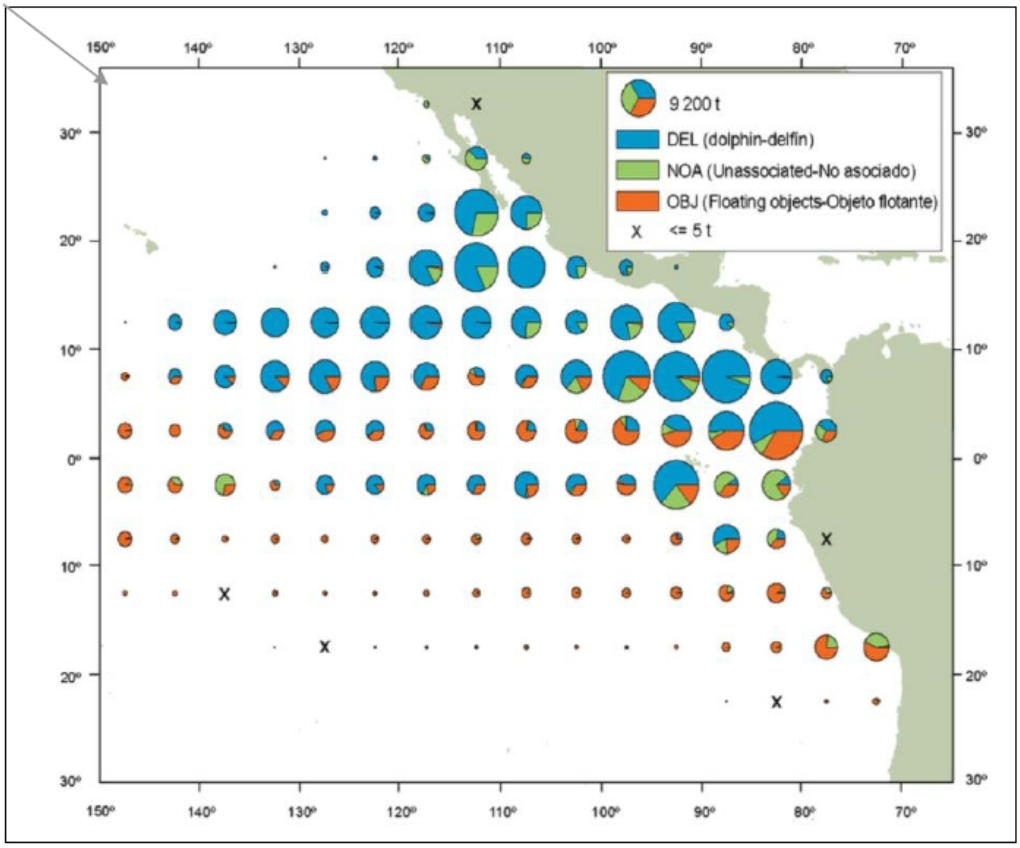
Distribution of catches of different species over smaller scales within Area 77 is provided by the Inter-American Tropical Tuna Commission (IATTC), which was established in 1950 and responsible for the conservation and management of tuna and other marine resources taken by tuna-fishing vessels in the eastern Pacific Ocean. The principal species of tunas caught are the three tropical tuna species (yellowfin, skipjack, and bigeye), followed by the temperate tunas (albacore, and lesser catches of Pacific bluefin). Other scombrids (mackerels), such as bonitos and wahoo, are also caught.

Access to the fishery is regulated by Resolution C-02-03, which requires vessels to be on the IATTC Regional Vessel Register in order to fish for tunas in the eastern Pacific Ocean. Vessels are authorized to fish by their respective flag governments, and only duly authorized vessels are included in the Register. The IATTC also has significant responsibilities for the implementation of the International Dolphin Conservation Program, as tunas are often associated with dolphin schools and such schools provide locational guidance on setting of the tuna purse seine nets.

Almost all the catches in the eastern Pacific Ocean are made by the purse-seine and longline fleets. Detailed catch data are available for the purse-seine fishery, which takes over 90% of the total catches reported. Figure 17.12 shows the average annual distributions of the purse-seine catches of yellowfin, by set type, caught in each 5° by 5° reporting area for the period 2013–2017 (IATTC, 2019). The sizes of the circles are proportional to the amounts of yellowfin caught. DEL denote nets set in location of dolphin schools; OBJ denotes nets set under floating objects and OBJ denotes nets set without associated objects / fish schools. This graph shows some purse seining for yellowfin occurs in the vicinity of NORI Area D (approximately 115° W and slightly north of 10°N). Figure 17.13 shows distributions of the average annual catches (metric tonnes) of bigeye and yellowfin tunas in the Pacific Ocean by Chinese, Japanese, Korean, and Chinese Taipei longline vessels, over the same period. The vast majority of this fishing effort takes place to the south and west of the NORI Area D, with only minor contributions in the project area.

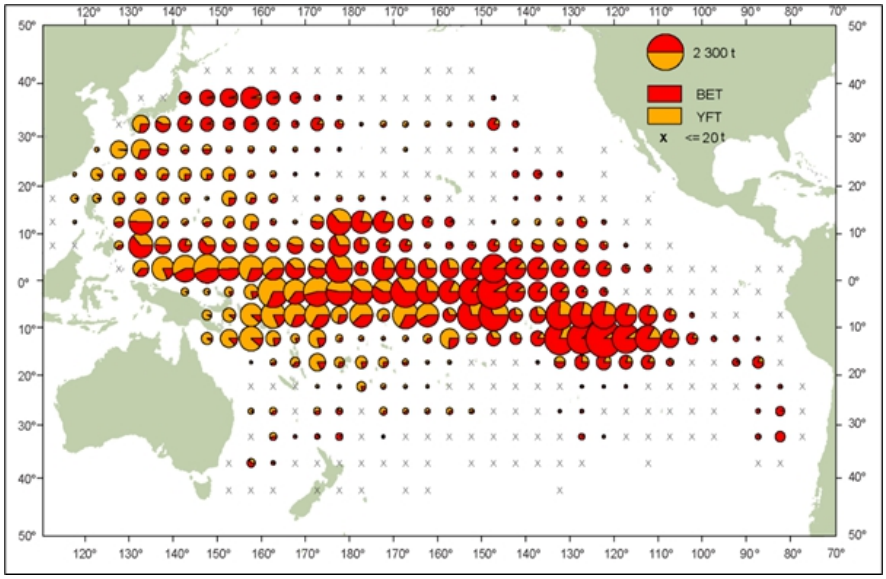
Overall, long term fishing activity within the CCZ near the Nori Area D appears low, based on monitored fishing vessel activity. Additional fisheries information on presence and sightings of fishing vessels will be collected as part of NORI's environmental work program.

Figure 17.12 Average annual distributions of the purse-seine catches in the Eastern Pacific Ocean of yellowfin tunas



Source: IATTC

Figure 17.13 Average annual catches of bigeye (BET) and yellowfin (YFT) tunas in the Pacific Ocean



Source: IATTC

17.8 Environmental and Social Impact Assessment (ESIA)

NORI has commenced the ESIA process in support of an application for an exploitation license for the commercial development of deep-sea polymetallic nodules. The objective of the ESIA is to describe the project, its potential benefits and the predicted environmental and socioeconomic impacts of project-related activities during the development and operation of polymetallic nodule mining operations. The completed EIS will enable the regulator (ISA) to make an informed decision on the approval of the project and if approved, any further conditions deemed appropriate.

Progression of the ESIA now requires that a comprehensive program of oceanographic, biological and metocean data acquisition be conducted to characterize the baseline conditions at a designated Collector Test Site and control sites in NORI Area D, to enable future validation of the ESIA's predicted residual impacts (i.e., after all mitigation) during and after mining operations. To date, NORI has completed the initial scoping and has developed detailed study terms of reference to be undertaken by appointed experts. The first of several dedicated environmental campaigns started in October 2020. The stages of ESIA progress are described below.

17.8.1 Environmental Impact assessment scoping

Scoping is a critical early step in the preparation of the ESIA and is the point at which issues and impacts that will be important in the decision-making process are identified for investigation by the ESIA (Durden et al 2018).

In June 2019, NORI held a technical stakeholder scoping study workshop in San Diego. Participants included members of the ISA and Government of Nauru, environmental practitioners and academics from the fields of deep-sea mining and academia. The participants followed a structured process of identification of zones of impact through the water column to the seafloor, then linking to each the impacting activities that are associated with polymetallic nodule harvesting. The output from this workshop formed the basis of a detailed scoping document and terms of reference for all the offshore environmental studies needed over the next two to three years to meet the regulatory requirements of the ISA (NORI 2020a).

In February 2020, NORI held a further multi-stakeholder workshop involving diverse stakeholders from academia, the regulator and industry, which focussed on the scoping of the NORI ESIA program. A number of NGO's which have advocated against nodule production were invited but declined to participate in the workshop.

The objectives of the Scoping Phase were to:

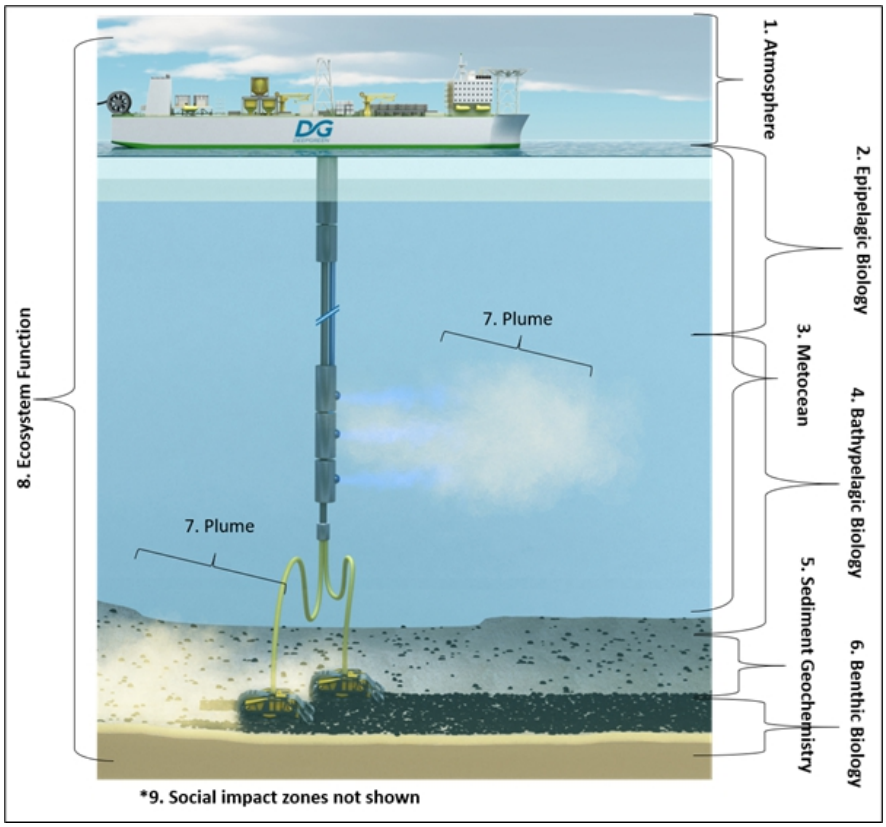
- Identify stakeholders and inform them of the proposed Project and the ESIA process.
- Provide stakeholders with the opportunity to identify any issues and concerns associated with the proposed Project.
- Identify areas of likely impact and environmental and social issues that may require further investigation by the ESIA.
- Develop the Terms of Reference (TORs) for specialist baseline and impact assessment studies in response to initial stakeholder input.
- Release the Scoping Report, including draft TOR for specialist studies, for stakeholder review and comment.

In principle, the main issues, in order of perceived priority and relevant to NORI Area D, were identified as:

- Seafloor – direct physical impact of mining/sampling equipment.
- Smothering/burying of fauna by sediment deposition.
- Change in seafloor sediment characteristics post mining (e.g., removal of solid surfaces, such as nodules suitable for attached species colonisation).
- Clogging of suspension feeders.
- Potential release of toxic trace metals and other contaminants.
- Loss of essential habitat (spawning/nursery grounds).
- Likely long time periods for recolonization and recovery of key species groups.
- Water column effects on behaviour of mammals, mesopelagic or migratory fish and plankton through changes in water composition (e.g., chemical contamination) and clarity.
- Surface increased vessel activities and potential pollution (includes risks associated with extreme weather events).
- Reduction in primary production through shading by discharges (if near-surface discharges occur in photic zone).
- Effects on behaviour of surface mammals, fish and birds through changes in water composition and clarity, noise and lights from vessel activity.
- Bioaccumulation of toxic metals through food chain.
- Sediment plume through water column from seafloor operations or midwater discharges.
- Local changes in pH.
- Nutrient and trace mineral enrichment (if near-surface discharges in photic zone).
- Potential oxygen depletion.

Figure 17.14 shows the zones through the water column to the seafloor, where the impacts of nodule harvesting are likely to occur.

Figure 17.14 Potential impact zones through the water column



Source: NORI

After the impact zones were defined a suite of baseline studies was recommended as part of the ESIA to supplement the existing knowledge base and provide site specific data to inform the EIS. A list was developed by participants for each impact zone which described the focus and best available data collection techniques that should be employed. The outputs constitute a seabed-to-surface approach to conducting baseline studies as summarized in Table 17.1 and described in more detail in Section 20.8.2.

Table 17.1 Summary of outputs from June 3-5 workshop, San Diego, USA

Impact Zone	Study Focus	Data Collection Technique
Atmosphere	Meteorology	Desktop studies / At-sea met station
	Air quality	Desktop studies / Emissions incl. Greenhouse Gases
	Seabirds	Desktop studies / At-sea observations
	Light Environment	Desktop studies
	Noise environment (non-human impacts)	Desktop studies
Epipelagic Biology Bathypelagic Biology	Discharge vessels (surface)	Routine discharges / Process for transporting materials / Spills (behavior of material)
	Oil spills	Modelling / Post-impact response planning
	Wave climate	Desktop studies / Opportunistic vessel motion- wave height / Spotter buoys
	Noise environment (non-human impacts)	Moorings / Hydrophones / Engineering design – thrusters - RALS
	Biological environment	Cetaceans and other pelagic megafauna, debris, vessels – observations / Phytoplankton / Zooplankton / Micronekton / Bacterial collection and identification
	Water quality	Sample collection and laboratory analysis
Metocean	Upper, mid and lower water column noise	Hydrophones
	Cetacean presence	Hydrophones
	Sediment flux through water column	Sediment traps
	Sediment flux near seabed	Sediment traps
	POM flux through water column and near seabed	Sediment traps
	Isotope flux through water column and near seabed	Sediment traps
	Upper and midwater column physical oceanography	Moorings - CTD/ADCP
	Lower water column physical oceanography	Moorings - CTD/ADCP
	Vertical water movement	Moorings - CTD/ADCP
Sediment Geochemistry	Contaminant characterization	Screening study / Elutriate test / potential release of toxic metals
Benthic Biology	Habitat mapping	Desktop studies / Geomorphology mapping / Substrate mapping (nodule grades, distribution) / Mine plan development
	Biological communities – Microfauna, Meiofauna, Macrofauna, Megafauna, Demersal scavengers	Targeted taxonomic and distribution studies (AUV / Box cores / Multicores)
	Biotope characterisation	Biotope mapping and analysis

Impact Zone	Study Focus	Data Collection Technique
Plume	Upper and midwater column physical oceanography	Moorings - CTD/ADCP/ Hydrodynamic modelling
	Lower water column physical oceanography	Moorings - CTD/ADCP
	Sediment characterisation	Grain size / Physicochemical / Flocs
	Temporal water column physicochemical characterisation	CTD profiles / Niskin bottles
Ecosystem Function	Energy flows	Ecosystem modelling
Social	Stakeholders screening and mapping	Stakeholder screening / Mapping / Engagement Plan
	Training	Capacity building implementation plan
	Sponsoring state coordination	Communications and coordination plan
	Other marine users – Fishing, Subsea Cables, Military operations, Shipping, Cultural heritage	Desktop studies / Focused Studies
	Academic outreach	Communications and coordination plan

17.8.2 Project environmental impacts

The main impacts expected to occur during polymetallic nodule collection will involve removal from the seabed of material, with associated alterations to habitat and fauna. The lifting of nodules from the seabed will require the removal of water brought back to the surface with the nodules from the seabed. The separation of the seawater will likely occur immediately above or near to the collection site, either on the CSV or bulk carriers. The seawater that will be separated from the nodules will need to be discharged back to the sea. The discharge water will likely contain some fine material, made up primarily of residual sediment and fragments of nodules.

17.8.2.1 Impacts to surface waters

Impacts to surface waters will depend upon the type, number, and size of vessels and platforms deployed at the nodule collecting sites. Impacts associated with surface vessel operations are not exclusive to nodule collecting operations but will need to be considered. These include noise and lights with the main vessel operation, as well as support vessels and bulk carriers moving in and out of the area; vessel emissions to air; and routine discharges associated with vessels (noting that these will be governed by international legislation such as the International Convention for the Prevention of Pollution from Ships (MARPOL) and by specific management plans prepared in relation to particular aspects of operations from which impacts might arise (for example, the effects of lighting on seabirds).

17.8.2.2 Impacts to midwater column

Some noise and vibration of the riser are expected from the pumping of nodules to the vessel and may be detectable by organisms inhabiting or diving through those parts of the water column. The intensity and attenuation of generated noise will need to be assessed in the ESIA. The water and contained residual sediments returned to the sea will result in the generation of suspended sediments to which organisms in the vicinity will be exposed and potentially some temperature differences, depending on the extent of counter-current equilibration. NORI's guiding philosophy is to discharge riser water at a depth and in a manner that causes the least and shortest-lived disruption to the ocean's biology, physics, chemistry and ecosystem services. The selection of that depth will be informed by hydrodynamic modelling to determine the extent of sediment dispersion and by identification of the organisms and their sensitivities to exposure to the sediment from the discharged riser water, including the physical and chemical composition of the sediments discharged.

17.8.2.3 Impacts to seafloor

Extraction of nodules will result in impacts to the fauna of the seafloor and overlying water column from the physical removal of habitat, the generation of suspended sediment, release of pore water and creation of new sediment surface with a physical structure and chemistry that may differ from that of the seabed prior to nodule extraction. The nodules are generally between 5 and 10 cm in diameter and lie half-buried in the sediment, and so some disturbance of substrate will occur. Mobile swimming or crawling animals may be able to move aside, but all sessile (immobile) benthic fauna in the path of the collecting operation will be affected. In areas of seafloor with soft sediment, much of the biodiversity is to be found in the top 5 to 8 cm of the sediment (Higgins and Thiel, 1988; Giere 1993); noting that, at the time of these references, size definitions of meiofauna extended to 300 or 500m and into what are now included within the macrofauna.

As for the midwater impacts, NORI's guiding philosophy is for the development plan to include design features to minimise sediment escape to the water column and confine impacts of disturbed material within the collector paths as far as practicable, thereby minimising impacts to undisturbed areas.

17.8.2.4 Benthic disturbance and recovery studies

The return of the CCZ to its pre-impact state after removal of nodules from the mined areas is not likely to occur within any foreseeable timeframe, given that nodule formation is believed to be in millions of years. However other species and functions would recover over periods that are measurable. A number of experimental impact-recovery time series research have been carried out under several programs such those identified in Jones et al. (2017), who reviewed changes in faunal densities and diversity of benthic communities measured in response to the 11 simulated or test nodule mining disturbances undertaken in or relevant to the CCZ. Almost all studies showed some recovery in faunal density and diversity for meiofauna and mobile megafauna.

Twenty-six years after the 1989 disturbance and recolonization (DISCOL) experiment carried out in the Peru Basin nodule field, suspension-feeder presence remained significantly reduced in disturbed areas, while deposit-feeders showed no diminished presence (Simon-Lledó et al., 2019). Similarly Vonnahme et al. (2020), and Stratmann et al. (2018) found varying times of recovery for other indices such as: significantly reduced uptake of fresh phytodetritus by bacteria, nematodes and holothurians in plow tracks; microbial community diversity unchanged compared to unplowed reference areas, but microbial cell numbers were 30% lower; and taxonomic composition of meiofauna and macrofauna was not significantly different between plowed and reference sites, but carbon uptake by bacteria, nematodes and holothurians was significantly lower at plowed sites. Overall, these authors estimated that it could take up to 50 years for the more sensitive indicators to return to undisturbed levels.

17.8.3 Scopes of work and terms of reference

Based on the outputs from the June 2019 San Diego workshop, and to comply with ISA regulatory requirements, NORI prepared a Scoping Report including Terms of Reference for baseline environmental studies relating to all off-shore components of the project (i.e. nodule collection and transportation) to be conducted within NORI Area D (NORI 2020a). The compilation of this report was designed not only to comply with ISA regulatory requirements but also to address data gaps and reduce uncertainties in project options during progressive phases.

The 2020 Scoping Report provides:

- Identification of the key issues and concerns for consideration in the development of the ESIA study,
- Identification of resource areas that have the potential to be impacted and environmental issues that may require further studies in the ESIA,
- The regulatory body (the International Seabed Authority) with the full scope of the proposed studies and tasks that NORI proposes to undertake in order to comply as far as practicable with the combined regulatory recommendations, set out in ISA documents: i) Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area (ISBA/25/LTC/6; 2020), ii) Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area (ISBA/19/LTC/8 (2013) and iii) Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for polymetallic nodules in the Area (ISBA/16/LTC/7; 2010); and
- Terms of Reference (TORs) for the ESIA studies that provide clear direction for the participating specialists on what needs to be assessed, how it will be assessed, and to what level of detail.

Several of these studies require long term information gathering using moored instruments or multi-year information collection to cover seasonal factors and to build robustness into hydrodynamic / plume modelling. As such baseline data collection in the NORI Area will require a multi-year program of work campaigns, spread over a three-year period. Key to this work is a comprehensive characterization and quantitative comparison of the baseline conditions at a designated Collector Test Site and control sites in the mining lease area.

The proposed campaigns planned for the NORI Area D Area (see Section 20.3) are designed and scheduled for the specialist consultants to complete their work in support of the preparation of the ESIA. Campaigns have been strategically timed to provide maximum time possible between consecutive sampling efforts, to coincide with known periods of seasonal variations in the water column, and to sample the Collector Test Site and a Preservation Reference Zone (PRZ)[23] twice before, and once following, the Collector Test.

17.8.4 Social license / stakeholder engagement

The NORI Area D project differs from a conventional land-based mining project in that there are no landowners or residents who would be directly impacted by the project through displacement or loss of assets. In this case, the key stakeholders include ISA member countries, sponsoring states, businesses in the fossil fuel replacement industries, and community groups with a range of interests in the deep sea and mining.

Engaging with these stakeholders early in the ESIA process is essential to understand their perspectives on the matters of importance to them. To this end, NORI has implemented a Communication and Stakeholder Engagement Plan (CSEP) to ensure that the communications and stakeholder engagement components of the ESIA are conducted in a structured manner, in accordance with international best practices, and that the outcomes of stakeholder engagement are aligned with the objectives of the ESIA and regulatory requirements.

23 An area representative of the area to be mined but outside the mine area of influence

The CSEP demonstrates NORI's commitment to a program of genuine engagement with stakeholders (e.g., regulatory authorities, governments, NGO's, environmental groups and the media, which values their contribution and their involvement in the project. In the first instance the CSEP has been developed specifically for the ESIA study scoping phase of the project (as shown in Figure 17.15) with ongoing engagement guidance as the project transitions from the exploration to exploitation phases of the project. Managing relationships with key stakeholders, including regulatory authorities, governments, NGO's, environmental groups and the media, is critical - not just to the project's reputation and outcomes - but to the reputation of the proponents, investors and partner organizations responsible for bringing the project to fruition.

The objectives of the stakeholder consultation are to:

- demonstrate open and transparent communication.
- create awareness and understanding of the project.
- identify who needs to be aware of what information and when.
- ensure consultative opportunities are provided to ensure effective consideration and management of environmental issues throughout the ESIA.

The CSEP is intended to be a 'live' document and will be updated throughout the project lifecycle post the ESIA phase. A summary of communications and stakeholder engagement objectives as they relate to the Scoping Phase of the EISA is shown in Figure 17.15.

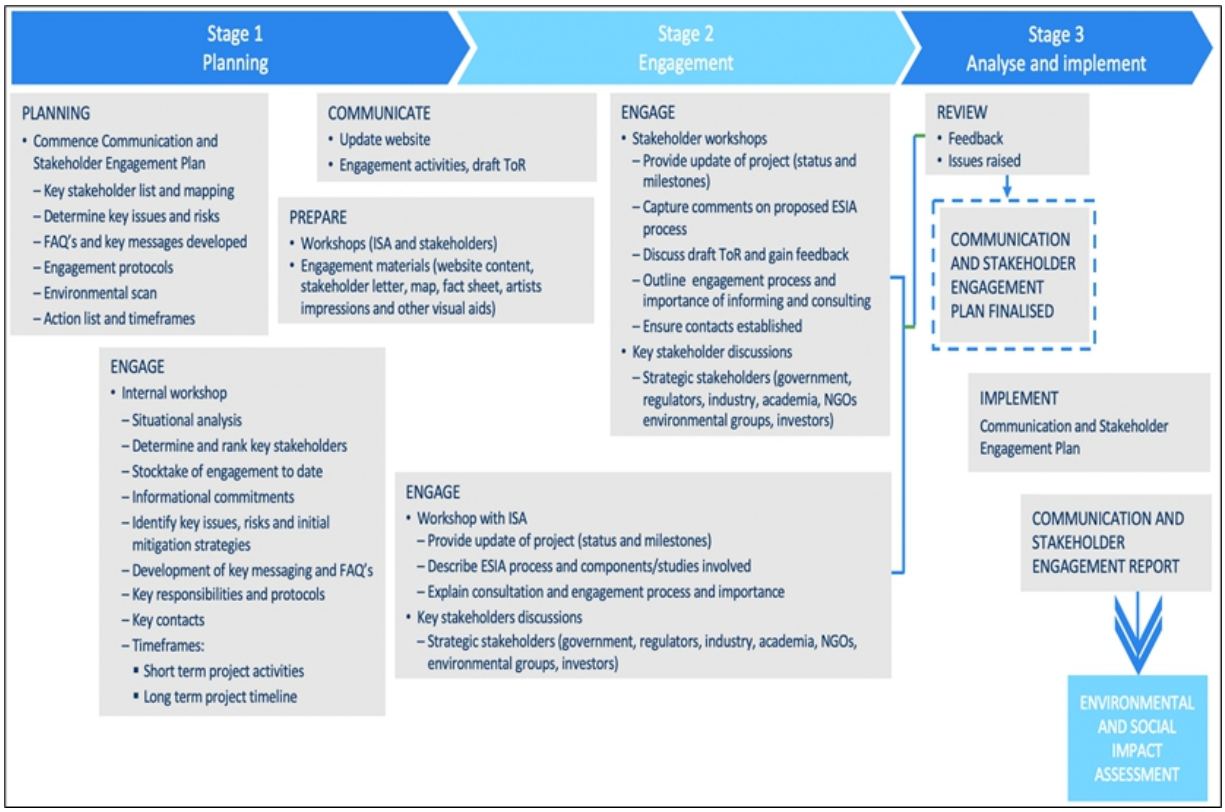
The key activities that have been initiated by NORI to date include:

- The June 2019, technical stakeholder scoping study workshop in San Diego, in which the participation of independent scientific institutions in the ESIA underscores the company's commitment to transparency during the exploration phase.
- Establishment of formalized partnerships with leading scientific research institutions and internationally renowned universities in a significant investment into its ongoing ESIA program of work.
- Organisation of the February 2020 two-day workshop in San Diego attended by more than 70 people from all over the world. Stakeholder meetings (in-person and online) to introduce NORI's environmental baseline thinking and initial planning and to seek feedback.
- February 2020 – Kingston, Jamaica – side event presentation at ISA Council meeting to stakeholders on NORI's environmental baseline thinking and initial plan.
- February 2020 – Kingston Jamaica – meeting with ISA Environment department to present Scoping Report and TOR concept and timelines.
- June/July 2020 – Submission of Scoping Report to LTC.
- October 2020 – response from LTC stating it did not have time to review Scoping Report and will provide feedback in the future.
- Funding of an independent, in-depth lifecycle assessment study that compares the cradle-to-gate impacts of two sources of metals – land ores and deep-sea polymetallic metals. The study produced a white paper, followed by three webinars in May and June 2020 on the white paper, where the lead authors presented the findings and answered questions live.
- Publication of life cycle climate change impacts of producing battery metals from land ores versus deep-sea polymetallic nodules (Paulikas et al, 2020).
- Production of news and media articles available via the DeepGreen website.
- Training opportunities, particularly for pacific island nations, and job advertisements via the website.

Initiatives planned over the next 6–12 months include:

- Release of the Scoping Report to workshop participants for feedback and review.
- Public release of Scoping Report for comments, revision based on public feedback, and submission of revised Scoping Report to LTC, noting public comments and changes incorporated.
- 2021 – submission of EIA to LTC and posting publicly for feedback for Collector Test in 2022 (must be submitted 12 months in advance).

Figure 17.15 Communications and Stakeholder Engagement objectives (scoping phase)

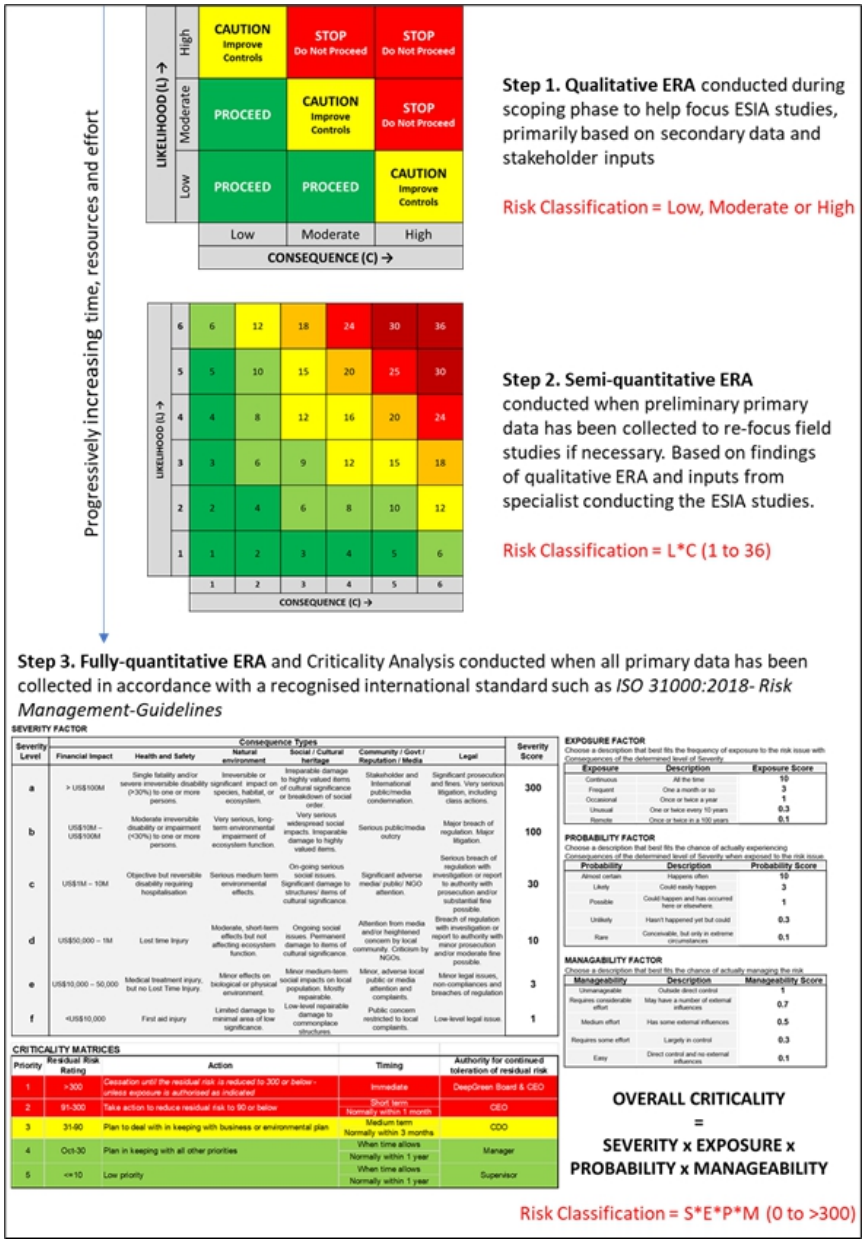


17.8.5 Project environmental impact assessment process

The impact assessment process predicts the likely changes to the existing environment that would arise as a result of the project activities and then evaluates the significance of those identified impacts, both in terms of the magnitude of impact (e.g., in duration or extent), and on the key environmental receptors, such as biodiversity, ecosystem services and conservation status of organisms. The initial screening is qualitative, based on secondary knowledge of the receiving environment and expert judgement of sources of impacts and impacts themselves. As the project's collection of primary environmental data progresses and greater definition of engineering details is available, so the assessment enables more quantitative estimates of the scales of impacts, thereby identifying the activities for which mitigation will be required.

The results of an initial qualitative Environmental Risk Assessment (ERA), seen as Step 1 of Figure 17.16, is based on secondary data that were used to inform the scoping process and develop a focused Plan of Work for the ESIA (NORI 2020a). The ERA will transition progressively from low, moderate and high in Step 1 to semi-quantitative and fully quantitative assessments in Steps 2 and 3, respectively, of Figure 17.16, as the information and feedback from the studies becomes available from the forthcoming campaigns.

Figure 17.16 Qualitative, semi-quantitative and fully quantitative risk assessments



17.8.6 Ecosystem Based Management

The ISA document 'Draft regulations on exploitation of mineral resources in the Area' (ISBA/26/C/CRP.1; 17 December 2019) states that an 'ecosystem approach' should be adopted for the effective protection of the marine environment from the harmful effects arising from PMN mining in the CCZ. NORI anticipates that this requirement will be preserved in the final version of the regulations and is preparing terms of reference for the inclusion of an Ecosystem Based Management (EBM) approach to impact mitigation and management.

Internationally, the ecosystem approach to environmental management has emerged as the dominant paradigm for managing marine ecosystems, that aims to protect the health, productivity, and resilience of ecosystems as well as the ecosystem goods and services valued by human beings. According to the Convention on Biological Diversity (CBD), "the ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way".

EBM differs from conventional resource management in that it defines management strategies for entire systems, not simply individual components of the ecosystem. Importantly, EBM considers humans as an integral part of the ecosystem, since humans derive a portfolio of services from the ecosystem and also act as a driver influencing ecosystem processes. Thus, a key aspect of EBM is illuminating trade-offs among ecosystem services and management goals (see Levin et al. 2009).

17.8.7 Serious Harm

The ISA draft regulations define "*serious harm to the marine environment*" as "*any effect from activities in the Area on the marine environment which represents a significant adverse change in the marine environment determined according to the rules, regulations and procedures adopted by the International Seabed Authority on the basis of internationally recognized standards and practices informed by the best available scientific evidence.*

The definition of what constitutes "*significant adverse change*" or when harm becomes "*serious harm*" remains unclear. This is relevant in the context of the ESIA's needs to establish thresholds and targets against which serious harm can be benchmarked.

There are a number of references to workable definitions, e.g., Levin et al. (2016) narrowed the definition down by applying the FAO definition for "significant adverse impacts" as "those that compromise ecosystem integrity".

The FAO Guidelines provide that significant adverse impacts are "those that compromise ecosystem integrity" (Food and Agriculture Organisation, 2009, para 17). It lists six factors to consider:

1. intensity and severity of the impact.
2. spatial extent of the impact relative to habitat availability.
3. sensitivity and vulnerability of the ecosystem to the impact.
4. ability for the ecosystem to recover.
5. the extent of ecosystem alteration.
6. the timing and duration of the impact relative to species and habitat needs.

Operationalization of the definition of serious harm will be necessary to provide a practical benchmark against which success criteria can be developed for mitigation and monitoring purposes. This will require the identification of ecological thresholds and management targets for the critical components of the ecosystem that contribute to its integrity.

In practice, the impacts must first be identified and quantified, with mitigation measures then applied as necessary to reduce those residual impacts to as low as reasonably practicable (ALARP). Thereafter, only the regulatory authority can judge whether the benefits of the project justify acceptance of the residual impacts.

17.8.8 Precautionary Approach

ISA exploration regulations require that "*…sponsoring States (as well as the Authority) shall apply a precautionary approach as effected in Principle 15 of the Rio Declaration in order to ensure effective protection for the marine environment from harmful effects which may arise from activities in the Area…*" (Reg 31, para 2; Reg 33, para 2).

The Rio Declaration on Environment and Development, Principle 15 states:

"*in order to protect the environment, the precautionary principle shall be widely applied by States according to their capabilities, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*"

The precautionary approach indicates that positive action to protect the environment may be required before scientific proof of harm has been provided. The precautionary approach is triggered when, for a given action, there is a) potential for harm and b) uncertainty about causality and magnitude of impacts.

NORI will apply the Precautionary Approach throughout the ESIA process with continued adoption throughout the operational phase of the project. The application of a Precautionary Approach described by in ISA (2012) will be adopted.

17.8.9 Mitigation

NORI currently proposes to implement management and mitigation measures to minimise adverse environmental impacts in NORI Area D, in accordance with international best practices such as adherence to the Mitigation Hierarchy (Ekstrom et al., 2015; Holness 2018). The Hierarchy involves a sequence of four key actions - avoid, minimize, rehabilitate and offset— and provides a best practice approach to aid in the sustainable management of living, natural resources by establishing a mechanism to balance conservation needs with development priorities. It is acknowledged that application of the mitigation hierarchy framework in the deep-sea context presents different challenges, particularly when considering practicalities of rehabilitation and offsets in the deep-sea environment, (e.g., UNEP-WCMC, 2016; Niner et al., 2018). These potential limitations will be fully explored when applying the framework to the NORI Area D project. However, while relevant study information is being collected, NORI proposes in-principle mitigation design and activity that will include measures such as:

- Selection of a seabed production plan e.g., collector configuration, speed and sequential collection path to maximise collection efficiency and confine disturbance to the adjacent seabed and biodiversity.
- Engineering design options (e.g., hoods, screens or diffusers) to reduce impacts of sedimentation and deposition in adjacent areas.
- Minimisation of impacts to the water column by the use of a fully enclosed RALS.
- Conducting trial methods (e.g., plume flocculation) to minimise suspension of sediments from the collector, and to retain sediment deposition within the track of the collector, and not in adjacent mine tracks.
- Development of a hydrodynamic plume model to inform selection of the depth of the discharge point dewatering, taking into account environmental considerations, such as the:
    - Design of discharge to dilute to background as soon as possible.

  - Minimisation of loss of particles in discharge from dewatering.
  - Selection of discharge depth to minimise exposure to fauna and depth range of oxygen minima.
- The use of biodegradable fluids and oils in subsea equipment.
- The adoption of stray light and noise reduction strategies, while meeting essential surface and subsea operational safety requirements.
- The adoption of a waste management strategy that will address the management of sewage, chemical and hazardous materials to minimise the potential for contamination of the water column, including compliance with MARPOL.
- The development of emergency response plans to mitigate the effects of natural disasters and unplanned events.
- In addition to the PRZs and APEIs, it is estimated that approximately 27% of nodules will be left in the production areas after the collector has passed or between collector lines. These nodules may provide habitat for fauna dependent on hard surfaces.

17.8.10 Environmental management and monitoring plans

The ISA draft recommendations (ISBA/25/LTC/6/Rev.1) are that monitoring is conducted to ensure that no serious harm is caused to the marine environment from activities associated with the project. Environmental management of the project throughout the operational phase will require the implementation of the mitigation commitments in the ESIA to ensure that environmental targets are met and thresholds are not exceeded.

NORI will conduct monitoring during and after the operational phase of the project to validate predicted impacts and the effectiveness of mitigation measures applied. Its purpose is to include adaptive management of the project, and auditing of i) the accuracy of predicted impacts, ii) identification of any unexpected deviations from the predicted outcomes, iii) investigating reasons for any deviations, and iv) assessment of whether the mitigation measures have achieved their objectives of reducing or eliminating impacts.

The monitoring metrics and methods will be detailed in the Environmental Management and Monitoring Plan (EMMP). This is an important output of the ESIA process as it documents how NORI will implement, fund, and monitor the suite of mitigation measures described in the ESIA. The EMMP will demonstrate to the ISA that NORI has the technical knowhow, finances and will to minimize the residual impacts of the project to acceptable levels. The EMMP document will be issued as an attachment to the EIS.

A number of specific management plans will be required to support the NORI Area D project. These plans will be prepared as drafts and provided in support of the exploitation permit application. These plans may include but are not limited to:

- Conceptual closure plans.
- Emergency response plans.
- Waste management plans.
- Air quality management.
- Noise and vibration management.
- Lighting management.
- Marine mammal management.
- Biosecurity management (introduced species).

17.8.11Environmental Management System

The Environmental Management System (EMS) is a set of internal rules which are defined by a collection of policies, processes, procedures and records. This system will define how NORI will identify, assess, monitor and maintain the interactions with the environment during the operational phase in order to prevent negative environmental impacts.

ISO 14001:2015 is the international standard for the development of an effective EMS framework. This will be applied to exploitation operations to help NORI run successfully without any harmful effects and impacts on the environment. The standard is designed to maintain profitability and reduce environmental impacts of an organization's products, services and processes.

The EMS will include provisions for adaptive management, utilising management and monitoring measures described in the EMMP in an iterative decision process to improve understanding and management of the system. Key components of the adaptive management system currently under development include:

- Ongoing monitoring programs to track the status of biological resources over time (through an appropriate indicator) to assess changes in response to management and mitigation actions.
- Decision points at which management responses are selected from a set of alternatives developed as a result of modelling and risk assessment.
- Assessment of information gathered through monitoring to inform decision making, environmental performance evaluation, and iterative learning.
- Feedback loops established so that information and understanding from monitoring and assessment can be used to inform the selection of management actions; as the level of understanding of the system evolves, so too does the quality of decisions.

This adaptive management approach will facilitate an iterative cycle of decision making, monitoring, and assessment leading gradually to improved management as a consequence of improved understanding.

17.8.12 Reporting

The output of the ESIA process is NORI's EIS, which will set out factual information relating to the project and all the information gathered relating to screening, scoping, baseline study, impact prediction and assessment, mitigation, and monitoring measures. With the formal submission of the EIS, the regulating authority (ISA) will be in possession of the information required about the potential benefits and residual impacts of the project on the environment to make an informed decision on the issuance of an exploitation license.

17.8.13 Permitting risks

This section outlines the potential risks of delay or refusal by ISA of environmental approval for the NORI Area D project. To date, there is no approved seabed mining operation in the Area, although other contractors are currently at various stages of the ESIA process.

There are some examples of permit applications for deep-sea mining projects in national jurisdictions, briefly summarized as follows. Proposals for three projects in the New Zealand EEZ have so far been refused: for Neptune Resources/NIWA (iron sands and phosphorite nodule extraction), Trans-Tasman Resources Ltd (TTRL) for seabed iron ore extraction, and Chatham Rock Phosphate Ltd (CRP) for phosphate nodules. Some of the critiques common to all have been inadequate assessment of impacts or scale of impacts, inadequate understanding of "whole ecosystems", insufficient safeguards and uncertainty of models.

Environmental approvals were granted in 2009 for Nautilus Minerals Solwara-1 EIS for proposed mining of polymetallic sea floor massive sulphide deposits in the Papua New Guinea EEZ. However, the project has not developed, mostly for technical and financial reasons. The project attracted NGO criticism post EIS for insufficient information on integrated benthic/pelagic ecosystems and lack of specific detail in the drafting of the Environmental Management and Monitoring Plan commitments.

Taking this information into consideration, NORI has followed a three-stage approach in developing the scope of work to ensure i) a rigorous and robust baseline is established to meet all ISA requirements, ii) a dynamic adaptive management system is implemented and iii) a staged approach to project implementation is followed.

At the time of writing, the ISA Regulations are in draft form, giving rise to a risk that the current terms of reference for the ESIA may not meet future (finalized) requirements with resultant information gaps. It is noted that the current (draft) content of the Regulations is comprehensive in coverage of the receiving ecosystem from microfauna to megafauna, and thereby quite onerous in comparison with typical requirements for terrestrial mining projects. In order to limit possible discrepancies developing over the period of the ESIA studies, NORI has developed the scope of work by systematically addressing each of the specific recommendations in the draft Regulations. NORI expects that recommendations for contractors for the assessment of the possible environmental impacts arising from exploration for polymetallic nodules in the Area will carry through from the draft to the final recommendations.

In addition, NORI will maintain frequent dialogue with ISA through the Legal and Technical Commission (LTC) as part of its Communication and Stakeholder Engagement Plan (CSEP) to ensure that any changes in requirements can be accommodated in a timely manner. It will also ensure that stakeholders (e.g., regulatory authorities, governments, NGOs, environmental groups and the media) are informed of project progress and lines of communication are maintained to address concerns arising.

17.9 Closure

The draft regulations on exploitation of mineral resources in the Area (ISBA/26/CRP.1) set out closure responsibilities that include preparation of Closure Plans within a prescribed time prior to planned closure, review of environmental performance guarantees, and post closure monitoring. There will therefore be some ongoing monitoring costs in fulfilment of the Closure Plans.

17.10 Onshore environmental and regulatory

Recovery of the target metals from the nodules will require on-shore processing. As yet, the processing plant has not been designed and its location and host country are not identified. The planned metallurgical process is not expected to produce solid wastes and the content of environmentally active trace metals such as cadmium and arsenic is low. However, NORI recognises that on-shore processing may have potential environmental impacts that should be formally assessed, in due course. NORI is committed to design the processing plant to achieve environmental performance consistent with best global practice and standards regardless of where the plant is built. A comprehensive environmental management plan to be compliant with EMS Standard ISO 14001:2004 will be developed during the Pre-feasibility Study Phase.

18 Capital and operating costs

The capital and operating costs have been split between on-shore and off-shore operations. The off-shore operations consist of all activity at sea, including the recovery of the nodules from the seabed, and transportation of the nodules to shore.

18.1 Project scale-up

NORI originally conceived development of NORI Area D with a production rate of 6.4 Mtpa (wet) of nodules, with processing of all the nodules in a new bespoke process plant. Early engineering studies and cost estimates were based on this scenario. For the current IA, NORI proposed a larger scale project, with processing of some of the nodule production under toll treatment arrangements. Toll treatment of nodules in the early years off the project would provide early cash flow without the need to bring forward capital expenditure on NORI's own plant.

In Project Zero, it is proposed that wet nodules will initially be processed in independent pyrometallurgical and hydrometallurgical plants a in toll treatment arrangement. NORI proposes that 4.1 Mtpa of nodules (wet) (3 Mtpa dry) will be processed in tolling arrangements each year (four pyrometallurgical plants by 0.75 Mtpa (dry)/plant). In Project One, once off-shore production increases above 3 Mtpa, the nodules will be processed in pyrometallurgical and hydrometallurgical plants operated and owned by NORI.

In Project One, the cost estimates off-shore property, plant and equipment are based on estimates prepared by DRT for NORI during the 2015 DRT scoping study and updated for this study. The scoping study cost estimates were generally derived from budget estimates supplied by original equipment manufacturers or engineering contractors that specialise in each of the items under consideration. DRT prepared new cost estimates for:

- Project Zero:
  - Upgrading the Hidden Gem drillship for commercial production at up to 1.3 Mtpa (wet) following the Collector Test.
- Project One:
  - Upgrading the Hidden Gem drillship to production at up to 3.6 Mtpa (wet).
  - Conversion of another drillship (Drill Ship 2) for production at up to 3.6 Mtpa (wet).
  - Construction of a bespoke PSV, Collector Ship 1, for production at up to 8.2 Mtpa (wet).

The costs are consistent with Class 4 estimates as defined by ASTM, AACE standards. Contingency is not included.

Estimates for Project Zero and Project One were prepared by DRT based on the assumption that the Hidden Gem sixth generation drillship being converted for the Collector Test would be upgraded to a commercial system following the Collector Test. Upgrading would take place in two stages:

1) Project Zero: would utilize the small collector vehicle (6 m width) from the Collector Test and its handling system (LARS).

2) Project One: would involve replacement of the small collector with two larger collectors and a new LARS to allow operation of the two larger collectors together.

To account for annual on-shore production that is higher than the 6.4 Mtpa (wet) of nodules baseline throughput values, the capital cost estimates were scaled up, pro-rata, based on capacity, with pyrometallurgical plant capacity 33% higher and hydrometallurgical plant capacity 80% higher. Limitations of the scaling approach include:

- Potential economies of scale are not considered.
- The 6.4 Mtpa (wet) baseline estimate is dated 2019, and the financial model 2020. No inflation adjustment was made.
- The 6.4 Mtpa (wet) baseline estimate was based on a single capital project execution approach, rather than a staged investment in multiple phases. Increased indirect costs for staged implementation of multiple projects were not considered.
- The forecast of construction duration for the 6.4 Mtpa (wet) baseline project is three years. The staged implementation for the larger project reflects shorter investment time periods which may be difficult to achieve for the initial stage.
- With respect to operating costs, no adjustments were made to the 6.4 Mtpa (wet) baseline estimate of unit production costs to reflect higher initial fixed costs (for partial production) and lower later fixed costs (for higher production) due to project staging.

The QPs consider that for the IA, which has an accuracy of the order of +/- 50%, the scaling factors are reasonable.

Based on the required production throughputs, NORI proposes to build and operate four RKEF lines and two hydrometallurgical refineries. The construction schedules of the RKEF lines are as follows:

- RKEF Lines 1 and 2: 2024 to 2026 with production commencing in 2027.
- RKEF Line 3: 2025 to 2027 with production commencing in 2028.
- RKEF Line 4: 2026 to 2028 with production commencing in 2029.

The construction schedules of the hydrometallurgical refineries are as follows:

- Hydrometallurgical refinery 1: 2024 to 2026 with production commencing in 2027.
- Hydrometallurgical refinery 2: 2027 to 2029 with production commencing in 2030.

Costs for NORI’s proposed process plant have been considered from the arrival of the nodules at the facility to the production of final product and load out for transport from the facility.

Capital costs are divided into a pre-project period, construction costs during the project period, an operating period when sustaining capital expenditure (off-shore and on-shore) will be required and closure costs at the end of the operating period. All capital and operating costs are in US dollars.

Capital expenditure estimated at US$10.6 billion is required between 2021 and the completion of the project in 2046. A breakdown of the total is given in Table 18.1.

Table 18.1 Summary of all capital costs

Section	Cost estimate (US$ million)
Pre-project costs	$237
Project costs	
Off-shore project costs (including 25% contingency)	
Project Zero	$204
Project One	$2,244
Total	$2,448
On-shore project costs (including 32% contingency)	
Project One	$4,786
Total	$4,786
Total project costs	$7,234
Sustaining capital costs (on-shore and off-shore)	$2,637
Closure costs	$500
Total	$10,607

18.2 Pre-project capital cost estimates

NORI has estimated the costs that it expects to incur during study and engineering phases prior to construction. The pre-project period is expected to extend from 2021 until early 2024. The pre-project capital includes the costs of converting the Hidden Gem for the Collector Test, and the Collector Test itself. The pre-project cost estimates are summarised in Table 18.2.

Table 18.2 Pre-project capital costs

Section	Cost Estimate ($US million)
Equity Account	$37.5
Off-shore Development	$70.6
On-shore Operations	$36.3
Off-shore Operations	$32.7
Environment	$12.5
Geoscience & Mine Development	$0.4
Regulatory Approval	$2.4
Personnel costs	$36.8
Corporate costs	$1.7
Communications	$3.2
Business Development	$2.3
Total	$236.5

18.3 Project-period capital cost estimates

18.3.1 Off-shore capital costs

18.3.1.1 Project Zero: Hidden Gem Upgrade

The Hidden Gem Drillship will be taken to a shipyard after it has been modified and used for the Collector Test and upgraded to be capable of producing up to 1.3 Mtpa, including one self-propelled collector and RALS. This system will have a design life of five years.

It has been assumed in the development of this cost estimate that the existing accommodation block, drilling and vessel systems on the Hidden Gem were either removed from the vessel, if not required, or refurbished and converted for use as a mining vessel for five years operation. The vessel will also be surveyed and classified by a recognized Class Society for operation as a Mining Vessel.

The capital expenditure (CAPEX) cost estimate for upgrading the Hidden Gem for up to 1.3 Mtpa operation includes engineering, procuring and integrating in a Singapore vessel conversion shipyard. The following changes/additions to the Hidden Gem used for the Collector Test are included:

- New air compressors to replace the leased units on the Collector Test with sufficient capacity to operate the air lift riser for the design production rate.
- Airlift discharge de-aeration and pressure let down system to provide an 8 bar pressurized discharge.
- Dewatering equipment and storage of the nodules in the vessel’s existing Crude Oil Tanks.
- Slurrification and nodule offloading pumps and offloading hose reels and hawser to offload the nodules to a tandem moored Dynamically Positioned Transport Vessel.

- Slurry water return system from the Transport Vessel for subsurface disposal.

Note that equipment redundancy has been minimized to reduce CAPEX due the limited production time (five years) for this operation.

The cost includes reusing the collector umbilical system and modifying the collector vehicle used in the Collector Test. A completely new riser system and flexible jumper hose string between the collector and the steel riser will be purchased. It is assumed that the LARS purchased for the Collector Test and existing drillship ROV LARS modifications, will be suitable for Project Zero.

No allowance has been included in the CAPEX estimate for a mark-up by a contractor to execute the Engineering, Procurement and Construction/Commissioning (EPC) of the Hidden Gem upgrade. Therefore, the following are excluded from the CAPEX estimate:

- Taxes
- Duties
- Contractor costs for Letter of Credit, Bank Guarantee, and Performance Bond
- Owners costs for Program Management
- Cost of finance and project financing arrangements, if not neutral cash flow
- CAR Insurance
- Liability insurance
- Warranty / Repairs allowance
- Contractor profit
- Contractor overhead recovery (head office, bid preparation costs, etc.)
- Pre-project Engineering and Development Costs

CAPEX costs are summarized in Table 18.3. Transportation costs, including vessel charter, are included in the operating expenditure estimate (OPEX).

Table 18.3 Project Zero: CAPEX for Hidden Gem upgrade

2020 Costs (US$ million)	Collectors	Lift (Riser Only)	Production Vessel	TOTAL
Vessel Acquisition & Management	$0.0	$0.0	$0.5	$0.5
Single Unit Procurement including Vessel Acceptance Testing (excl. O&M Crew)	$18.5	$28.7	$42.7	$89.8
Initial Spares Inventory	$6.1	$4.3	$3.9	$14.3
Engineering & Subsystem Test	$4.5	$5.7	$9.5	$19.8
Project Management	$1.9	$2.9	$4.5	$9.3
Mobilisation to Site, Integration, Site Commissioning	$2.1	$6.2	$21.0	$29.3
TOTAL	$33.1	$47.8	$82.1	$163.0

18.3.1.2 Project One: Hidden Gem Upgrade

Following five years of operation, the Hidden Gem will be upgraded for production of up to 3.6 Mtpa with a design life of 20 years.

The CAPEX estimate for upgrading the Hidden Gem includes engineering, procuring and integrating, in a Singapore vessel conversion shipyard, including the following changes/additions to the 1 Mtpa mining vessel:

- Increased air compressor capacity to operate the air lift riser for the design production rate.
- Refurbishment of the hull structure and coatings to achieve the design life of 20 years with minimal steel renewal at special survey dry dockings.
- Providing mining equipment redundancy to provide the reliability and availability to achieve the total annual nodule production tonnage required.
- Provide additional electrical switchgear and MCCs to operate the additional redundant mining equipment.
- Relocate the Collector LARS system forward of the moonpool where space exists to handle, store and maintain larger collectors on deck.
- Provide two additional 7 MW power generation units to provide additional power for larger air compressor capacity.

The cost includes purchasing two new larger collector vehicles for simultaneous operation subsea. The existing flexible jumper hose power reel and collector umbilical system will be used but a second new flexible jumper hose reel and collector umbilical system will be purchased to enable the installation and operation of a second subsea collector.

The flexible jumper and riser from Project Zero will be replaced, due to wear and tear from the 5 years operation, and second flexile jumper hose string purchased for the second collector.

The riser and collector vehicles are considered to have a five-year service life, and their replacement every five years is considered Sustaining Capital. The actual service life may be greater or less than this and can only be determined after further engineering, testing and actual service experience.

The purchase of two new ROVs, complete with control cabin, have been included in the CAPEX for the 20-year design life with two collectors instead of leasing one as was done for Project Zero.

No allowance has been included in the CAPEX for a mark-up by a contractor to execute the EPC of the Hidden Gem upgrade. Therefore, the following are excluded from the CAPEX estimate:

- Taxes
- Duties
- Contractor costs for Letter of Credit, Bank Guarantee, and Performance Bond
- Owners costs for Program Management
- Cost of finance and project financing arrangements, if not neutral cash flow
- CAR Insurance
- Liability insurance
- Warranty / Repairs allowance
- Contractor profit
- Contractor overhead recovery (head office, bid preparation costs, etc.)
- Pre-project Engineering and Development Costs
- Contingency – 25% contingency was added in the economic analysis presented in Section 22 of this report

Table 18.4 provides a summary of the CAPEX for upgrading the Hidden Gem from 1 Mtpa to a 2.6 Mtpa production vessel.

Table 18.4 Project One: CAPEX for upgrade of Hidden GEM

2020 Costs ($US million)	Collectors	Lift (Riser Only)	Production Vessel	Total
Vessel Acquisition & Management	$0.0	$0.0	$2.3	$2.3
Single Unit Procurement including Vessel Acceptance Testing (excl. O&M Crew)	$67.4	$29.1	$111.8	$208.3
Initial Spares Inventory	$13.2	$3.6	$8.1	$24.9
Engineering & Subsystem Test	$4.8	$1.2	$9.7	$15.7
Project Management	$6.8	$2.4	$5.4	$14.6
Mobilisation to Site, Integration, Site Commissioning	$4.6	$4.8	$21.3	$30.7
TOTAL CAPEX	$96.7	$41.2	$158.6	$296.5

18.3.1.3 Project One: Drill Ship 2 Conversion

A second used drillship (Drill Ship 2) will be purchased and converted for use as second production vessel capable of producing up to 3.6 Mtpa for a 20-year design life. Since the vessel has not been previously used for mining operations, the existing hull structure and coatings, accommodation unit, and drilling and vessel systems will need to be removed if not being used for mining operations or refurbished and converted for an additional 20-year operation as a mining vessel.

An acquisition price of US$50 million was assumed for a used sixth generation drillship, based on current market information (Tomic, 2020).

The CAPEX estimate for converting Drill Ship 2 includes engineering, procuring, and integrating in a Singapore vessel conversion shipyard. The following changes are included:

- Air compressor module with capacity to operate the air lift riser for the design production rate.
- Refurbishment of the hull structure and coatings to achieve the design life of 20 years with minimal steel renewal at special survey dry dockings.
- Removal of the drilling equipment not to be used during the vessel operation as a mining vessel.
- Mining equipment redundancy to provide the reliability and availability to achieve the total annual nodule production tonnage required.
- Additional electrical switchgear and MCCs to operate the additional redundant mining equipment.
- New Collector LARS system forward of the moonpool where space exists to handle, store, and maintain larger collectors on deck.
- Dewatering equipment and storage of the nodules in the vessel’s existing Crude Oil Tanks.
- Slurrification and nodule offloading pumps and offloading hose reels and hawser to offload the nodules to a tandem moored Dynamically Positioned Transport Vessel.
- Slurry water return system from the Transport Vessel for subsurface disposal.
- Two new ROVs and control cabin to support disconnection and retrieval operations of two operating subsea collectors, for maintenance and storm preparation operations.
- Refurbish existing drilling ROV LARS to support two mining ROVs.
- Provide two additional 7 MW power generation units to provide additional power for the larger air compressor capacity.

The cost includes purchasing two large new collector vehicles for simultaneous subsea operation, as well as two new flexible jumper hose powered reels with jumper hose strings and two collector umbilical systems.

A new RALS with steel nodule production riser, air lift injection line, seawater slurry disposal line, and buoyancy will be purchased.

No allowance has been included in the capital cost estimate for a mark-up by a contractor to execute the EPC of the Drill Ship 2 refurbishment and conversion. Therefore, the following are excluded from the CAPEX estimate:

- Taxes
- Duties
- Contractor costs for Letter of Credit, Bank Guarantee, and Performance Bond
- Owner's costs for Program Management
- Cost of finance and project financing arrangements, if not neutral cash flow
- CAR Insurance
- Liability insurance
- Warranty / Repairs allowance
- Contractor profit
- Contractor overhead recovery (head office, bid preparation costs, etc.)
- Pre-FID Engineering and Development Costs.
- Contingency – 25% contingency was added in the economic analysis presented in Section 22 of this report.

Table 18.5 presents a summary of the CAPEX for converting Drill Ship 2 to a production vessel.

Table 18.5 Project One: CAPEX for conversion of Drill Ship 2

2020 Costs (US$ million)	Collectors	Lift (Riser Only)	Production Vessel	Total
Vessel Acquisition & Management	$0.0	$0.0	$63.5	$63.5
Single Unit Procurement including Vessel Acceptance Testing (excl. O&M Crew)	$67.8	$29.3	$166.0	$263.1
Initial Spares Inventory	$13.3	$4.4	$15.7	$33.3
Engineering & Subsystem Test	$4.9	$5.8	$19.1	$29.8
Project Management	$6.8	$2.9	$7.7	$17.4
Mobilisation to Site, Integration, Site Commissioning, & Start-up	$4.6	$6.3	$31.1	$42.1
TOTAL	$97.4	$48.8	$303.0	$449.1

18.3.1.4 Project One: Collector Ship 1 construction

The Collector Ship 1 costs are based upon the previous Scoping Study performed in 2015 by DRT (DeepReach Technology Inc., 2015), revised in November 2020 as follows:

- Collector vehicle costs were adjusted to consider the commercial collector design developed by Cellula Robotics, Inc. (Cellula Robotics Ltd., 2015). This involved an addition of buoyancy material to maintain acceptable bearing load.
- Collector vehicle costs were adjusted to include capability to eliminate sediment entrained by the collector head from entering the riser. This includes additional ducting and clean water pumps. The design is based upon ongoing research into this improvement to the collector.

- CAPEX and OPEX costs were scaled to account for an increase in the nominal production rate to 8.2 Mtpa versus 6.4 Mtpa. This is to allow the project to take advantage of higher abundance (20 kg/m^2 versus 15.9 kg/m^2 assumed in the 2015 study).

Inflation of CAPEX was assumed to be zero in view of the current market situation for capital costs in the upstream energy markets (IHS Market, 2021). This data shows a 10% deflation in upstream capital costs since 2015. New build shipbuilding costs have been static since 2015.

Table 18.6 summarises the capital expenditure costs for the construction of Collector Ship 1 for 6.4 Mtpa production. Cargo ships to transfer nodules from the PSV to port are excluded from the estimate. These vessels will be chartered. In this table:

- “Single unit(s) procurement” refers to one production fleet consisting of five collectors, one RALS, one production vessel, and one collector support vessel.
- “Initial spares inventory” includes spare parts for the first year of operation. An allowance of 5% of single unit costs was used, except for 10% allowance for the collector.
- “Detailed engineering and subsystem testing” refer to the engineering and tests devoted to each sub-system. Design of the material handling and airlift system are included under the production vessel cost category. These include both non-recurring costs (for example, engineering) and recurring costs (for example, factory acceptance testing) associated with the design and test of each subsystem.
- “Project management” was estimated at approximately 2% of the single unit procurement cost.
- “Start-up, mobilisation, integration and commissioning” includes the activities of integrating all the equipment and performing trials in shallow and deep water prior to commencing ramp-up of extraction operations. An allowance of nine months of operations is included for this activity.

As was the case for the other vessels, no allowance has been included in the capital cost estimate for a mark-up by a contractor to execute the EPC of the refurbishment and conversion. Therefore, the following are excluded from the CAPEX estimate:

- Taxes
- Duties
- Contractor costs for Letter of Credit, Bank Guarantee, and Performance Bond
- Owners costs for Program Management
- Cost of finance and project financing arrangements, if not neutral cash flow
- CAR Insurance
- Liability insurance
- Warranty / Repairs allowance
- Contractor profit
- Contractor overhead recovery (head office, bid preparation costs, etc.)
- Pre-project Engineering and Development Costs
- Contingency – 25% contingency was added in the economic analysis presented in Section 22 of this report.

Table 18.6 Project One: CAPEX for Collector Ship 1

2020 Costs (US $million)	Collectors	Lift (Riser Only)	Production Support Vessel incl OFE	Collector Support Platform (PSS)	Total
Single Unit(s) Procurement	$164.4	$98.0	$384.1	$199.6	$846.0
Initial Spares Inventory	$16.4	$4.6	$19.2	$10.0	$50.2
Detailed Engineering & Subsystem Test	$14.2	$10.4	$17.3	$5.8	$47.6
Project management	$3.3	$2.0	$7.7	$4.0	$17.1
Startup, Mobilization, Integration & Commissioning	$0.0	$0.0	$65.9	$22.6	$88.5
Total	$198.3	$114.9	$494.1	$242.1	$1,049.4

18.3.1.5 Collector support vessel

A semi-submersible collector support vessel will maintain the collectors deployed by Collector Ship 1. The collector support vessel capital cost estimates were based on the actual costs for the Helix Deepwater Well Intervention platform Q4000, built in the Keppel AmFELS yard in Brownsville, Texas in 2002. The actual costs for this vessel were reportedly US$180 million. US shipbuilding price escalation is estimated at 150% (FRED, 2020) for an estimated cost of US$270 million in 2020. For this IA, a discount of 30% was estimated for Chinese versus US construction to estimate the cost for Chinese construction in 2020.

18.3.1.6 Project management

Project management costs represent an allowance for an integrated project team to manage and integrate the front-end engineering and design, which would be performed by one or more contractors. The cost estimates were based on engineer’s estimates made by DRT, escalated by the US consumer price index (CPI) since 2015.

18.3.2 On-shore capital cost for Project One

Capital costs have been estimated for the construction of the processing facility to handle 4.88 Mt (dry) of nodules per year. The estimate has been developed according to Association for the Advancement of Cost Engineering Class 5 level of accuracy (–35% +50%) and is expressed in first quarter 2019 US dollars. A contingency of 32% has been applied to the estimate. Owner’s costs and escalation beyond 2019 are excluded.

The on-shore capital cost estimates are summarised in Table 18.7. Further details of the estimate are provided in Table 18.8.

Table 18.7 Summary of project period on-shore capital costs

Section	Cost estimate (US$ million)
General	$179
Pyrometallurgical plant	$1,052
Hydrometallurgical refinery	$483
Total direct cost	$1,713
Indirect costs	$622
Total direct and indirect costs	$2,335
Contingency	$746
Total on-shore capital cost	$3,081

Table 18.8 Summary of project period on-shore capital costs by plant area

Section	Cost estimate (US$ million)
General	
Site development, roads and buildings	$46
Power supply and distribution	$46
Utilities	$76
Mobile equipment	$10
Total general	$179
Pyrometallurgical Plant	
General (building/substation)	$276
Feed handling	$106
Rotary kiln calcining	$216
Electric furnace smelting	$340
Converter aisle sulphidation	$113
Total pyrometallurgical plant	$1,052
Hydrometallurgical refinery	
Matte receiving and handling	$18
Leaching & Purification	$87
Copper EW	$107
Cobalt SX and Purification	$62
Nickel SX	$80
Crystallisation & Product Packaging	$82
Reagents and Utilities	$48
Total hydrometallurgical refinery	$483
Total direct on-shore costs	$1,713

Key assumptions that have been made in developing the estimate include:

- The processing plant will be situated on a flat site.
- Nodules will be delivered to the plant boundary, at the rate required by the process (any buffering to decouple ship unloading rates from conveying rates is assumed to be done at the port).
- Minimal storage of materials and reagents is provided at the plant.
- Utilities will be provided at the plant boundary, including power, water and natural gas.
- Oxygen will be supplied on a cost per tonne basis (sale of gas basis).
- The plant will be built near a major municipality, no camp infrastructure is assumed for construction or operating labour.

The following items are excluded from the capital cost:

- Sunk and legal costs.
- Special incentives and allowances.
- Owner’s costs, including permitting and construction insurance.
- Escalation, interest and financing costs.
- Start-up costs beyond those specifically included.
- Additional exploration expenses.
- Delivery of utilities (power, water, natural gas) to the plant boundary. High voltage power lines would be supplied by others up to the plant main substation.

- Port facilities including storage.
- Equipment (permanent or mobile) required to transport feed materials from the port to the plant boundary.
- Equipment (permanent or mobile) required to transport products from the plant to port facilities.

18.4 Sustaining capital cost estimates

The sustaining capital costs (dry dock) for the vessels are:

- Hidden Gem Dry Dock: US$327 million (US$109 million per dry dock)
- Drill Ship 2 Dry Dock: US$349 million (US$109 million per dry dock)
- Collector Ship 1 Dry Dock: US$742 million (US$232 million per dry dock)
- Total: US$1,418 million

The sustaining capital includes replacement of collectors and risers during each 5-year dry docking cycle, as well as statutory maintenance required to maintain the vessels in class. The sustaining capital allowance was reduced for the last dry dockings for Drill Ship 2 and Collector Ship 1 because their remaining production life at those points is only two and one years, respectively.

For the process plant, sustaining costs of 1.25% of the total on-shore capital costs were applied from the first year of production (2024) to end of the scheduled project life (2046). Total sustaining capital for the on-shore components of the Project is estimated
as US$1,219 million.

18.5 Closure cost estimates

A closure cost of US$500 million has been allowed in 2046 for remediation of the on-shore minerals processing facility.

Very little infrastructure is expected to be established in the seafloor production areas. Closure costs associated with off-shore activities, which will include post-closure monitoring, are not expected to be material to the IA cost estimates.

18.6 Operating cost estimates

The estimated operating costs, when production reaches steady state in 2030, are summarised in Table 18.9.

Table 18.9 Operating costs at steady state production

Section	Average Operating Cost over Life of Mine (US$ million/annum)	Average Unit Cost (US$/t - wet tonne nodules recovered)	Average Unit Cost (US$/t - dry tonne processed)
Off-shore	$240.7	$19.3	$25.40
Shipping	$254.4	$20.4	$26.84
On-shore	$1,286.2	$103.1	$135.71
Other	$25.0	$2.00	$2.64
Total	$1,806.3	$144.85	$190.59

18.6.1 Off-shore operating costs

The operating cost estimates used in this IA are based on estimates prepared by DRT for NORI during the 2015 DRT scoping study. The cost estimates were revised in February 2019. The US Department of Labor, Bureau of Labor Statistics Index CPI-U - Consumer Price Index for All Urban Consumers, increased by 5.848% from May 2015 to January 2019. For this IA, labor-related costs were escalated from 2015 estimates by this CPI value.

Operating expenses are dominated by the cost of fuel, originally based upon a cost of US$660 per tonne in the Los Angeles/Long Beach market. Since 2015, fuel prices have varied from a low of US$385 per tonne in early 2016, to a high of US$785 per tonne in Q4 2018. On 27 February 2020, the price was US$464 per tonne. This IA is based on a fuel price of US$500 per tonne, which is the same as the 2015 estimate, and is within the recent range of fuel prices in recent years. The qualified person considers this approach is reasonable.

The PSV crew is assumed to include 52 personnel of which 30 are devoted to mining operations, and the remainder marine crew. The collector support vessel crew includes 30 personnel of which eight would be devoted to collector and maintenance.

Maintenance costs have been factored from the initial capital expenditure at a rate of 5% per annum.

18.6.1.1 Project Zero operating costs

Off-shore operating costs estimated for Project Zero are shown in Table 18.10.

Owner’s costs include on-shore staff for support of the operations, maintenance, mine planning and logistics of the mining operation, and operation of a separate chartered survey vessel for environmental monitoring and survey.

Table 18.10 Project Zero - Annual Off-shore operating cost

2020 Costs (US$ million/annum)	Collectors	Lift (Riser Only)	PSV	Total (w/o transport)
Personnel	$0.0	$0.0	$16.5	$16.5
Fuel (after start of mining operations)	$0.0	$0.0	$23.4	$23.4
Maintenance, Repair and Support Services	$1.6	$1.2	$9.0	$11.9
Insurance	$0.2	$0.2	$0.6	$1.1
TOTAL	$1.9	$1.5	$49.5	$52.9

18.6.1.2 Project One operating costs

Operating costs for the Hidden Gem and Drill Ship 2 during Project One are shown in Table 18.11

Table 18.11 Project One - Summary of annual off-shore operating costs for Hidden Gem and Drill Ship 2

2020 Costs (US$ million/annum)	Collectors	Lift (Riser Only)	PSV	Total
Personnel	$0.0	$0.0	$19.3	$19.3
Fuel	$0.0	$0.0	$26.7	$26.7
Maintenance, Repair and Support Services	$3.1	$1.3	$9.6	$14.1
Insurance	$0.7	$0.2	$1.6	$2.5
Total	$3.8	$1.6	$57.1	$62.5

The annual operating costs for Collector Ship 1 during steady-state production of approximately 7 Mtpa (wet) are summarised in Table 18.12.

Table 18.12 Project One - Summary of annual off-shore operating costs for Collector Ship 1

2020 Costs (US$ million/annum)	Collectors	Lift (Riser Only)	PSV	Total
Personnel	$0.0	$0.0	$15.7	$15.7
Fuel	$0.0	$0.0	$47.1	$47.1
Inspection, Repair and Support Services	$8.2	$4.7	$9.9	$22.8
Insurance	$0.0	$0.0	$3.4	$3.4
TOTAL	$8.2	$4.7	$76.0	$88.9

The annual operating costs for the CSV during steady-state production is summarised in Table 18.12.

Table 18.13 Project One - Summary of annual off-shore operating costs for CSV

2020 Costs (US$ million/annum)	Total
Personnel	$8.3
Fuel	$5.0
Inspection, Repair and Support Services	$5.5
Insurance	$0.9
TOTAL	$19.7

18.6.2 Transportation costs

This IA assumes transportation of nodules will be by vessels equipped with dynamic positioning (DP) and dewatering capabilities, utilizing vertical cuttings driers which can remove all but 10% of the free moisture in the vessel holds. DP capability will enable vessels to be loaded at sea, astern of the PSVs.

Transhipment cost estimates are based on estimates by DRT. Trans-shipment model parameters and costs are summarized in Table 18.14. The table indicates buffer storage capacity is adequate to cover the interval between vessel arrivals for Project Zero, however Project One has less buffer storage than this (1.6 days production in buffer storage versus 2.5 days between vessel arrivals, on average). This could be resolved by increasing size and number of vessels in the fleet or by increasing the buffer storage on the PSV, e.g., by converting a larger bulk mineral carrier. These estimates are considered adequate for the purposes of this IA, however further study and optimization of dewatering systems, buffer storage and transport fleet parameters should be performed during the pre-feasibility phase. Tests to determine the amount of attrition during collection and lifting of the nodules will be necessary to inform materials handling and dewatering studies.

In Project Zero, the nodules will be transported to toll-treatment facilities in China. DGM has estimated a cost of $11/t of nodule (wet) to transport the nodules from the transhipment to Chinese ports.

In-country costs to unload and transport the nodules from the Chinese ports to the toll treatment plants are included in the toll treatment figure estimate of US$100/tonne of nodule (dry). Estimates were based on initial market intelligence provided by Shanghai Metals Market (SMM, 2020).

In Project One, the IA assumes that nodules will be shipped from NORI Area D to a port on the west coast of Mexico in the state of Michoacán where a process plant would be located. NORI has also used a figure of $US11/tonne of wet nodules for transportation from the ports to the process plants, based on estimates by Global Location Strategies (Global Location Strategies, 2019) undertaken for NORI. This figure includes off-loading at the port and transportation to the plant.

Table 18.14 Summary of parameters and costs for transport between vessels and transhipment

Vessel	Project Zero	Project One	
	Hidden Gem	Hidden Gem/Drill Ship 2	Collector Ship 1
Annual Production (Mtpa (wet))	1.3	3.6	8.5
Vessel Size (DWT)	35,000	100,000	100,000
No. Vessels in Fleet	2	2	3
Average Cargo Loading Rate (tph)	185	456	1665
Cargo Loading Time (days)	8.3	9.1	2.5
Total Cycle Time (days)	15.5	17.4	10.8
Buffer Storage (days production)	0.8	0.3	1.6
Time between vessel arrivals (days)	–1.2	-0.7	2.5
Annual Costs (US$ million/annum)			
Personnel	$4.5	$4.9	$8.3
Fuel	$4.3	$6.7	$22.4
Inspection, Repair and Support Services	$3.8	$6.8	$9.8
Insurance	$0.0	$0.1	$0.1
Vessel Charter	$6.1	$12.6	$18.9
TOTAL OPEX	**$18.7**	**$31.1**	**$59.4**

18.6.3 Programme management and logistical costs

Estimates of programme management and logistical costs are provided in Table 18.15.

Table 18.15 Programme management and logistical cost

Section	Costs (US$ million/annum)
Personnel	$3.2
Travel, G&A	$0.9
Vessel Charter (Survey & Support)	$10.0
TOTAL	**$14.1**

18.6.4 Other operating costs

Estimates of annual corporate and administration costs are presented in Table 18.16.

Table 18.16 Annual corporate and administration costs

Section	Cost (US$ million/annum)
Nauru administration fee	$0.1
Kiribati administration fee	$0.1
Environmental monitoring	$1.5
Corporate costs	$10.0
Total	**$11.7**

18.6.5 On-shore operating costs – Project Zero

An overall operating cost of US$100/tonne dry nodules has been assumed for the toll treatment option in Project Zero and Project One. The figure covers the costs for a third party to treat the nodules in its processing facilities to produce the various products. This figure was based on benchmarked operations.

For the production of the nickel alloy, an alloy treatment charge of US$300/tonne of alloy produced has been assumed. This is based on benchmarked figures and discussions with traders.

18.6.6 On-shore operating costs – Project One

Operating cost estimates were developed assuming a throughput of 4.88 Mtpa dry nodules. Operating cost and production were subsequently scaled by DeepGreen for the projected increase in production, as discussed in Sections 21 and 22.

Project One Operating costs have been estimated for a normal, full operating year, not a ramp-up year or a major outage year (e.g., with the appropriate design features, furnace rebuilds are typically needed after 15–20 years) and are summarised in Table 18.17.

Major consumables (energy, reagents) have been taken from the mass and energy balances calculated in the process models. Other costs have been estimated by reference to other projects at more advanced stages of definition. Unit prices have been assumed based on previous projects, in-house data, or allowances. Plant management and general supplies for the complete facility have been assigned to the pyrometallurgical plant.

Further details for the pyrometallurgical operating costs, including unit prices, are shown in Table 18.18.

Table 18.17 Summary of on-shore annual operating costs for Project One

Section	Cost estimate (US$ million)
Pyrometallurgical plant (for 4.88 Mtpa of dry nodules)	
Electricity	$223.0
Coal	$47.3
Natural gas and diesel	$26.6
Maintenance materials	$35.5
Smelting and sulphidation consumables and slag handling	$28.6
Plant labor, management	$24.2
Water and water treatment	$5.5
Total pyrometallurgical operating costs	$390.8
Hydrometallurgical refinery (for 62 ktpa of produced nickel)	
Electricity	$26.6
Anhydrous liquid ammonia	$25.6
Maintenance materials	$18.4
Oxygen	$13.0
Other consumables	$12.0
Sulphuric acid	$11.5
Natural gas and diesel	$5.0
Plant labor	$8.9
Water and minor reagents	$4.0
Sodium hydroxide	$1.9
Total hydrometallurgical operating costs	$127.2
Total annual on-shore operating costs	$518.0

Table 18.18 Summary of pyrometallurgical operating costs for Project One (4.88 Mtpa of dry nodules)

Component	Annual Requirement	Unit	Unit price (US$/unit)	Annual Cost (US$ million)
Electricity				$223.0
Furnace power	1,967,301	MWh	$100	$196.7
Non-furnace power	262,800	MWh	$100	$26.3
Natural Gas				$26.0
Calcining	246,062,250	Nm^3	$0.1	$24.6
Kiln idling and start-up	12,303,113	Nm^3	$0.1	$1.2
Converter aisle	2,000,000	Nm^3	$0.1	$0.2
Diesel	941,176	L	$0.66	$0.6
Coal	473,048	t	$100	$47.3
Smelting Consumables				$13.6
Electrode paste	5,901	t	$572.6	$3.4
Silica flux	281,184	T	$31	$8.7
Minor smelting consumables	-	-	-	$1.5
Sulphidation Consumables				$9.0
Silica flux	125,897	t	$31	$3.9
Sulphur	31,020	t	$160	$5.0
Pig casting molds	-	-	-	$0.1
Slag Handling				$6.0
Water & Water Treatment				$5.5
Makeup water acquisition	5,182,416	m^3	$1.00	$5.2
Water treatment chemicals	-	-	-	$0.3
Plant Labor				$21.2
Supervisors and managers	21	Personnel	$40,000	$0.8
Engineers and laboratory	65	Personnel	$30,000	$2.0
Site workers and operators	738	Personnel	$25,000	$18.5
Maintenance Materials				$35.5
Laboratory Supplies				$1.0
Plant Management				$2.0
Total Pyrometallurgy Operating Costs				$390.8

Further details for the hydrometallurgical operating costs, including unit prices, are shown in Table 18.19.

Table 18.19 Summary of hydrometallurgical operating costs for Project One (62 ktpa of produced nickel)

Component	Annual Requirement	Unit	Unit price (US$/unit)	Annual Cost (US$ million)
Reagents				$54.7
Sulphuric acid	176,199	T	$65	$11.5
Potassium hydroxide	1,611	T	$1,200	$1.9
Anhydrous liquid ammonia	48,364	T	$530	$25.6
Potassium metabisulfite	2	T	$350	$0.0
Oxygen	104,275	T	$125	$13.0
Cobalt extractant	30	T	$34,770	$1.0
Nickel extractant	29	T	$3,210	$0.1
SX diluent	119	T	$1,040	$0.1
Copper IX resin	8	m^3	$10,730	$0.1
D2EPHA Impregnated Resin	4	m^3	$16,040	$0.1
Granular activated carbon	442	m^3	$2,380	$1.1
Flocculant and coagulant	35	T	$5,100	$0.18
Energy				$38.0
Electricity	266,200	MWh	$100	$26.6
Natural gas	49,817,098	Nm^3	$0.1	$5.0
Diesel	321,067	L	$0.66	$0.2
Other Consumables				$12
Product packaging	-	-	-	$11
Filtration consumables and additives	-	-	-	$1
Water				$1.4
Makeup water acquisition	558,990	m^3	$1.00	$0.6
Pretreated water	1,934,072	m^3	$0.29	$0.3
Demineralised water	809,743	m^3	$0.59	$0.5
Plant Labor				$8.9
Supervisors and managers	9	Personnel	$40,000	$0.4
Engineers and laboratory	27	Personnel	$30,000	$0.8
Site workers and operators	310	Personnel	$25,000	$7.8
Maintenance Materials				$18.4
Total Hydrometallurgy Operating Costs				**$127.2**

An allowance for plant management costs (labour and others) has been made for both the pyrometallurgical and hydrometallurgical facilities. This has been assigned to the pyrometallurgical plant. Operating labour cost accounts for plant operations only in both the pyrometallurgical and hydrometallurgical facilities. Expenses associated with corporate and administrative activities such as human resources, finance, accounting, marketing, permitting, insurance among others are excluded from the estimate.

No contingency has been included in the on-shore operating cost estimate. Any cost item not explicitly listed above has been excluded.

18.6.7 Sulphidization costs

NORI has assumed that some third party RKEF plants will be modified to produce nickel copper cobalt alloy. Some of the alloy production will be shipped to the NORI hydrometallurgical plants to make use of spare capacity. This will require the alloy from the third party RKEF to be sulphidized. NORI has estimated a figure of US$3,000/t of nickel produced to account for the capital and operating costs of third party sulphidization treatment.

19 Economic analysis

A financial model based on estimates of future cash flows derived from extraction of nodules from the NORI Project has been developed in-house by DeepGreen. AMC reviewed the logic, input assumptions and integrity of the calculations and forecasts. The financial model is for NORI Area D only, which is at a preliminary level of planning and design.

The mining plan considered in this IA contemplates a 23-year production period. The expected production period is within the expected duration of a NORI Area D Exploitation Contract which would be thirty years (with possible extensions by periods of 10 years) as outlined in the current draft of the regulations for exploitation of Mineral Resources in the Area (ISBA /25/C/WP.1).

After the initial 23-year period, substantial resources will remain in the other NORI Areas that could support future mining (combined Inferred Mineral Resource in NORI Areas A, B and C of 510 Mt (wet) at 1.28% Ni, 0.21% Co, 1.04% Cu, 28.3% Mn, at an average abundance of 11 kg (wet)/m^2: Golder, 2013).

The project schedule is shown in the Gantt chart in Figure 19.1.

In Project Zero, NORI will toll treat the nodules in third party pyrometallurgical plants and sell the RKEF products into the alloy market. This will generate revenue whilst its pyrometallurgical and hydrometallurgical facilities are being built.

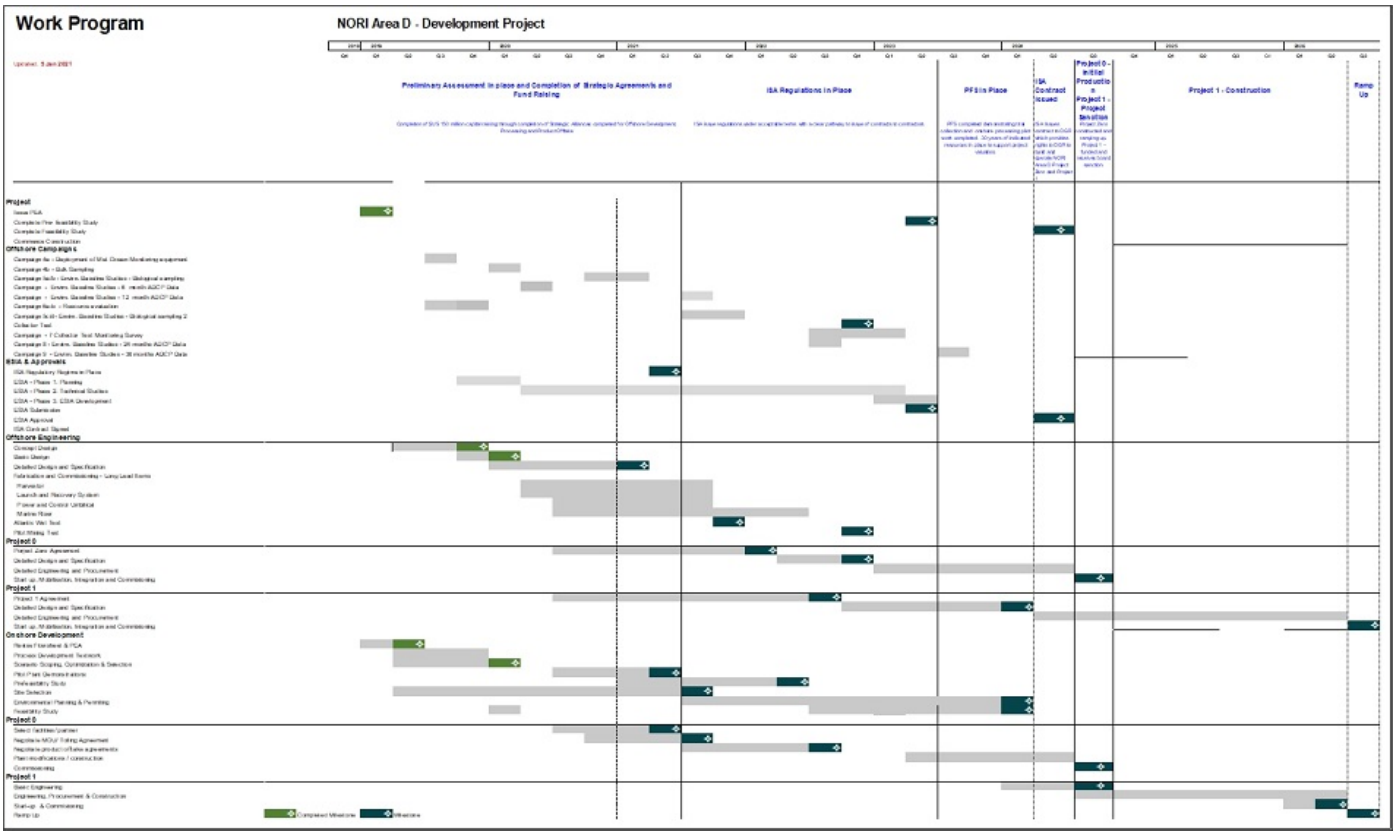
In Project One, NORI will stage the construction of its multiple pyrometallurgical and hydrometallurgical lines to flatten out capital expenditure requirements. Nodule production will be directed preferentially to the NORI pyrometallurgical plants as this is the lowest operating cost option. Whenever these facilities are at maximum capacity (particularly during the ramp-up phase), the surplus nodules will be sent for toll treatment.

NORI will ensure its own hydrometallurgical refineries are filled up to maximum capacity, as this produces the highest value products. Whenever its own hydrometallurgical refineries are at full capacity, NORI will sell the surplus product from its pyrometallurgical plant directly to the matte market. Whilst the matte is not as valuable as the refined products from the hydrometallurgical plant (nickel sulphate, cobalt sulphate, and copper cathode); it still provides a consistent revenue stream and assists for periods when the refineries are at full capacity.

Some of the alloy production from toll treatment of NORI nodules will be shipped to the NORI hydrometallurgical plants to make use of spare capacity. This will require the alloy from the third party RKEF to be sulphidized prior to hydrometallurgical treatment.

Based on discussions with buyers, NORI believes that there is sufficient demand for the alloy and matte over the life of the project.

Figure 19.1 Gantt chart showing proposed schedule of main project phases



19.1 Inputs

Post-tax, real (uninflated) cash flows are discussed in this report. The valuation date is 1 January 2021. The analysis was performed on a 100% ownership basis and excludes consideration of financing costs and forward metal sales. The IA assumes the economic parameters listed in Table 19.1.

Table 19.1 Economic inputs

Parameters	Units	Values
Hydrometallurgical plant Ni recovery	%	94.6%
Mn recovery	%	98.9%
Hydrometallurgical plant Cu recovery	%	86.2%
Hydrometallurgical plant Co recovery	%	77.2%
Pyrometallurgical plant Cu recovery	%	96.8%
Pyrometallurgical plant Cu recovery	%	93.3%
Pyrometallurgical plant Co recovery	%	92.7%
Mn silicate grade	%	40.0%
Cu cathode grade	%	99.9%
Payability of Cu content in cathode	%	100%
Nodule moisture content	%	24%
On-shore tax rate	% of taxable income	20%
Average off-shore royalty	% of taxable income	6.7%

19.1.1 Commodity prices

Project revenues will come from the following sources:

- A nickel sulphate product
- A copper cathode product
- A cobalt sulphate product
- A manganese silicate product
- An ammonium sulphate product
- A nickel alloy product containing copper and cobalt.
- A matte product from the NORI pyrometallurgical plants containing nickel, copper and cobalt which would be sold to the matte market.

NORI has used the following payable percentages for the alloy:

- Nickel: 80% of in-situ value in the alloy.
- Copper: 40% of in-situ value in the alloy.
- Cobalt: 80% of in-situ value in the alloy.

The following treatment charges and refining charges for the alloy product were used in the NORI financial model:

- A refining charge of US$1,697/tonne of contained nickel in the alloy.
- A refining charge of US$800/tonne of contained nickel in the alloy.
- A refining charge of US$6,700/tonne of contained nickel in the alloy.
- A treatment charge $300/tonne of alloy.

For the matte product, NORI has used a used a payables figure of 83% of the market metal price of nickel, copper and cobalt.

The metal recoveries for the matte and alloy are those from the pyrometallurgical plant, whilst the refined products (nickel sulphate, copper cathode and cobalt sulphate) are from the hydrometallurgical refinery metal recoveries.

The prices forecast by CRU (CRU, 2020) and adopted for use in this IA are listed in Table 19.2.

Less than 1% of total revenue will be derived from production and sale of ammonium sulphate A price of US$90/t of ammonium sulphate has been assumed in this IA.

The Qualified Person considers the metal price assumptions underpinning the IA are reasonable.

Table 19.2 Commodity prices

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Average from 2034-2046
Ni metal (US$/t)	$14,067	$14,467	$14,868	$15,269	$15,670	$16,071	$16,472	$16,472	$16,472	$16,472	$16,472
Ni contained in Ni Sulphate (US$/t Ni)	$15,610	$16,027	$16,443	$16,860	$17,269	$17,678	$18,087	$18,087	$18,087	$18,087	$18,087
Mn contained in SiMn (US$/dmtu Mn)	$4.78	$4.73	$4.69	$4.64	$4.59	$4.54	$4.49	$4.49	$4.49	$4.49	$4.49
Cu metal (US$/t)	$6,435	$6,497	$6,557	$6,615	$6,673	$6,730	$6,787	$6,805	$6,822	$6,839	$6,872
Co metal (US$/t)	$52,881	$39,914	$38,204	$41,526	$45,137	$49,062	$51,106	$50,600	$49,126	$47,695	$46,333
Co contained in Co Sulphate (US$/t Co)	$64,250	$49,035	$46,933	$51,014	$55,450	$60,272	$62,784	$62,162	$60,351	$58,594	$56,920

19.1.2 Tax

In undertaking this economic assessment AMC has relied on DeepGreen’s analysis of tax treatment of future revenue streams. AMC is not an expert in tax affairs.

The economic assessment is on a post-tax basis. Royalties payable to the ISA, and to the sponsoring state (Nauru) have been accounted for.

The ISA royalty has not been finalized, but discussions are focusing on a royalty that is calculated on an ad valorem basis that references LME pricing but excludes consideration of metallurgical recovery and pricing premia. It is at a rate of 2% for the first five years of production, and 6% thereafter. A further 1% environmental levy was added.

On-shore earnings consider a transfer pricing mark-up of 20% on off-shore operating costs. No off-shore corporate tax was applied.

NORI has not yet committed to locating its on-shore operations in any particular country. The Qualified Person considers it reasonable to expect that potential host nations (and provinces within potential host nations) will compete for the opportunity to host the on-shore operations and will offer favourable taxation arrangements. As a basis to selecting a corporate tax rate for use in this IA, AMC has referred to a publication titled International Comparison of Corporate Income Tax Rates, published by the Congress of the United States Congressional Budget Office (March 2017). The average tax rate (i.e., the total amount of corporate income taxes that companies pay relative to their income after excluding marginal enterprises) for companies operating in Mexico was reported to be 20.3%. Accordingly, AMC selected 20% as the corporate tax rate for this IA.

Straight-line depreciation of onshore and offshore assets was used to calculate the depreciation expense applicable. A depreciation period of 10 years was used for on-shore assets and a depreciation period of five years was used for off-shore assets.

The analysis indicates that the Project will generate approximately US$7.2 billion in undiscounted royalties payable to the ISA and Nauru, and US$9.1 billion in on-shore corporate tax payable to the host nation of the processing plant.

19.1.3 Production schedule

The production schedule on which the economic analysis is based was developed on an annual basis. The Qualified Person cautions that a prefeasibility study has not been undertaken and that the seafloor production schedule is preliminary in nature and should not be interpreted as a Mineral Reserve. Approximately 96% of the Mineral Resource within NORI Area D is classified as Indicated and a further 1% is classified as Measured Resource. The LOM production sequence includes 6 Mt (wet) of nodules that are classified as Inferred Mineral Resources. This is approximately 2% of the total LOM production.

The production schedule assumes staged operation initially of the Hidden Gem, then Drill Ship 2 and finally Collector Vessel 1, as out lined in Section 16.1.

The nodule metal grades and nodule abundance varying annually according to the life of mine schedule. The grades and nodule abundance for the mine plan were derived from a preliminary production schedule developed by AMC as outlined in Section 16.7. The higher abundance areas were targeted by the production schedule. The metal grades and abundance used in the schedule are compared to the averages (of all Mineral Resource categories) for NORI Area D in Table 19.3.

Table 19.3 Comparison of IA mine plan to Mineral Resource for NORI Area D

	Mineral Resource in NORI Area D (all categories)	**Seafloor production plan**	**Difference (%)**
Tonnage (Mt wet)	356	254	71%
Nodule abundance (kg/m^2)	17.0	16.9	99%
Ni grade (%)	1.40	1.4	100%
Mn grade (%)	31.2	31.0	99%
Cu grade (%)	1.14	1.1	100%
Co grade (%)	0.14	0.14	98%

The production ramp-up discussed in Section 17 was adopted for the production schedule. The Qualified Person considers the assumptions underpinning the IA are reasonable.

19.2 Results

All cash flows are denominated in millions of US dollars. The analysis excludes capital sunk prior to 1st January 2021 and excludes the value of the intellectual property that NORI will accrue during the operation. The total cash flows are summarised in Table 19.4.

The analysis indicates a positive economic outcome. Undiscounted post-tax net cash flow of US$30.6 billion is expected. An internal rate of return of 27% has been modelled. Discounted cash flow analysis of unleveraged real cash flows, discounting at 9% per annum, indicates a project net present value (NPV) of US$6.8 billion. Excluding the inferred mineral resources from the economic analysis, the post-tax project NPV is estimated at $6.7 billion, which is not a significant difference from the economic analysis that includes the inferred mineral resources.

The cumulative undiscounted cashflows are shown in Figure 19.2 and the discounted cash flows and progressive NPVs are shown in Figure 19.3. The project reaches its lowest cumulative undiscounted cash flow figure of US$4.0 billion in 2026. Undiscounted payback period is 6.6 years after commencement of production.

Table 19.4 Summary of cash flows

Cash flow item	Value (US$ million)
Nickel revenue	$44,106
Manganese revenue	$26,785
Copper revenue	$12,685
Cobalt revenue	$11,075
Ammonium sulphate revenue	$439
Total revenue	**$95,090**
Pre-project capital	$237
Off-shore construction	$2,448
On-shore construction	$4,786
Off-shore sustaining capital	$1,418
On-shore sustaining capital	$1,219
Closure costs	$500
Total capital	**$10,607**
Off-shore operating costs	$5,154
Shipping costs	$5,266
On-shore operating costs	$26,544
Corporate costs	$560
Total operating costs	**$37,524**
Royalties	$7,195
Onshore tax	$9,123
Taxes and royalties	**$16,318**
Net undiscounted cash flow	**$30,641**

Figure 19.2 Cumulative undiscounted cash flows

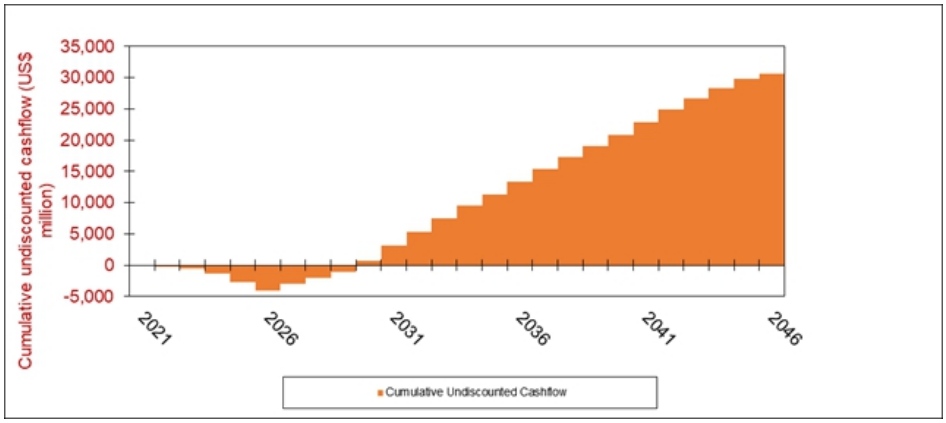
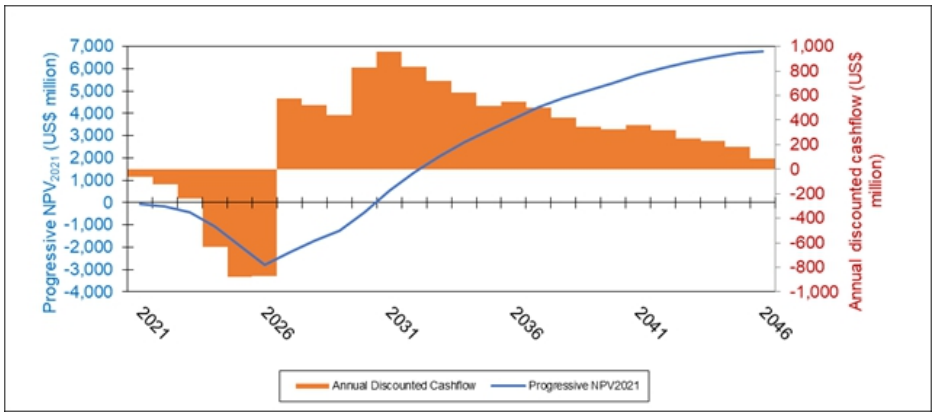


Figure 19.3 Project NPV2021 and discounted cash flow



The analysis indicates that the Project will generate approximately US$7.2 billion in undiscounted royalties payable to the ISA and Nauru, and US$9.1 billion in on-shore corporate tax payable to the host nation of the process plant.

As outlined in Section 21, total project development capital required is $US7.5 billion, but because of the staged development approach, it is anticipated that revenue will be received prior to the finalization of project capital investment. The maximum negative cumulative undiscounted cash flow is expected to reach -$US4.0 billion in 2026. This is the level of capital finance that would be required to develop the project under the proposed development scenario and capital payback is expected 6.6 years after the start of production. The maximum negative annual discounted cash flow is -US$876 million.

The date of the investment decision (decision to mine) is 30th June 2023. NORI expects to spend $237 million on pre-project activities between 2021 and the date of the investment decision. The future value of the project on 30th June 2023 (after the pre-project expenditure is sunk and time has elapsed) will be US$8.6 billion and the IRR from that point will be 29%.

A summary of the revenues for the life of the project is shown in Table 19.5.

Table 19.5 Project revenues by year, over life of project

	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Nickel in Alloy Revenue	694	94	-	242	113	112	-	-	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper in Alloy Revenue	205	34	-	83	38	37	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt in Alloy Revenue	62	14	-	21	11	12	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel in Matte to Market Revenue	3,625	-	487	675	443	734	577	9	201	150	119	4	0	54	51	-	0	0	121	19	-	-	0	-
Copper in Matte to Market Revenue	1,203	-	162	230	147	240	188	3	64	49	38	1	0	17	16	-	0	0	39	6	-	-	0	-
Cobalt in Matte to Market Revenue	876	-	115	163	106	186	141	2	52	35	29	1	0	12	12	-	0	0	29	4	-	-	0	-
Nickel Sulphate Revenue	39,877	-	-	-	1,059	1,084	1,110	2,272	2,272	2,272	2,272	2,272	2,201	2,272	2,272	2,260	2,084	2,240	2,272	2,272	2,092	2,007	1,779	1,516
Copper Cathode Revenue	11,277	-	-	-	306	310	317	641	637	645	642	648	622	645	638	640	586	634	644	637	587	566	503	428
Cobalt Sulphate Revenue	10,137	-	-	-	277	300	297	613	639	584	599	555	567	557	565	568	499	584	587	576	519	476	413	362
Manganese Silicate Revenue	26,785	108	428	849	1,166	1,377	1,126	1,326	1,508	1,433	1,403	1,320	1,270	1,353	1,350	1,302	1,201	1,286	1,394	1,318	1,202	1,159	1,030	876
Ammonium Sulphate Revenue	439	-	-	-	11	17	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22
Total Nickel Revenue	44,106	94	487	918	1,614	1,931	1,688	2,281	2,517	2,422	2,391	2,275	2,201	2,326	2,323	2,260	2,084	2,240	2,393	2,291	2,092	2,007	1,779	1,516
Total Copper Revenue	12,685	34	162	313	491	586	505	644	716	693	680	650	622	662	654	640	586	634	683	643	587	566	503	428
Total Cobalt Revenue	11,075	14	115	174	394	498	438	616	696	619	627	556	567	569	577	568	499	584	616	580	519	476	413	362
Total Manganese Revenue	26,785	108	428	849	1,166	1,377	1,126	1,326	1,508	1,433	1,403	1,320	1,270	1,353	1,350	1,302	1,201	1,286	1,394	1,318	1,202	1,159	1,030	876
Total Ammonium Revenue	439	-	-	-	11	17	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	22
Grand Total	95,090	251	1,172	2,253	3,677	4,409	3,780	4,889	5,459	5,190	5,124	4,823	4,682	4,933	4,927	4,792	4,393	4,767	5,109	4,855	4,423	4,230	3,749	3,203

A summary of capital costs by year, for the life of the project is shown in Table 19.6.

The summary of operating costs for the life of the project is shown in Table 19.7.

Table 19.6 Capital costs by year, over life of project

	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Royalties	7,196	10	46	88	140	168	306	396	443	420	415	390	379	399	399	388	355	386	414	393	358	342	303	259
Revenue	95,890	251	1,172	2,253	3,677	4,409	3,780	4,889	5,459	5,190	5,124	4,823	4,682	4,933	4,927	4,792	4,393	4,767	5,109	4,855	4,423	4,230	3,749	3,203
Offshore OPEX	10,420	96	212	422	456	479	382	496	515	507	505	496	491	500	500	495	484	495	506	498	486	481	468	451
Offshore Depreciation	3,739	133	337	418	407	400	365	221	140	137	124	104	90	90	90	90	90	90	90	90	90	73	35	35
Offshore Markup	2,832	46	110	168	173	176	149	143	131	129	126	120	116	118	118	117	115	117	119	118	115	111	101	97
Onshore Revenue Base	78,100	-	24	513	1,245	2,641	3,354	2,883	4,029	4,673	4,417	4,369	4,103	3,985	4,226	4,219	4,090	3,704	4,066	4,393	4,150	3,732	3,566	3,145	2,620
Onshore OPEX	26,544	100	514	963	1,213	1,402	1,025	1,300	1,526	1,437	1,409	1,297	1,242	1,346	1,344	1,287	1,156	1,277	1,419	1,317	1,168	1,108	947	749
Corporate Costs	560	10	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
EBITDA	50,995	-	134	-	26	257	1,404	1,928	1,833	2,704	3,121	2,955	2,935	2,781	2,718	2,855	2,850	2,779	2,523	2,764	2,949	2,807	2,540	2,433	2,173	1,846
Onshore Depreciation	5,737	50	114	288	349	435	499	505	511	517	523	479	421	253	198	118	59	59	59	59	59	59	59	59	59
EBIT	45,258	-	184	-	140	-	32	1,055	1,492	1,334	2,198	2,610	2,438	2,412	2,302	2,297	2,603	2,652	2,661	2,463	2,704	2,890	2,748	2,480	2,374	2,114	1,786
Tax	9,123	-	-	-	-	211	298	267	440	522	488	482	490	459	521	530	532	493	541	578	550	496	475	423	357

Table 19.7 Operating costs by year, over life of project

	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Offshore Vessel Operating Costs																								
Project Zero: Hidden Gem 1 Mtpa	264	53	53	53	53	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project One: Hidden Gem 2.6 Mtpa	1,063	-	-	-	-	-	-	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Drillship 2	1,221	-	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Collector Ship 1	1,867	-	-	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
CSV	414	-	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Program Management and Logistics	324	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Total	5,154	67	122	231	231	231	178	241	241	241	241	241	241	241	241	241	241	241	241	241	241	241	241	241
Shipping Operating Costs																								
Total	5,266	29	90	191	224	248	204	255	275	266	264	255	251	259	259	254	244	254	265	257	245	240	227	210
Onshore Operating Costs																								
Tolling	6,818	73	290	582	486	486	147	303	438	380	365	302	271	329	329	297	223	293	373	315	231	197	107	-
Sulphidisation	2,529	-	115	162	162	162	59	120	162	151	145	120	107	131	130	117	88	115	147	124	91	77	42	-
Refinery	5,229	20	79	159	221	264	217	259	295	280	275	258	250	266	265	256	236	254	276	261	237	228	202	172
RKEF Line	10,023	-	-	-	261	391	521	521	521	521	521	521	521	521	521	521	521	521	521	521	521	521	521	513
Product Logistics	1,945	7	30	59	82	98	81	97	110	105	102	96	93	99	99	95	88	94	102	96	88	85	75	64
Alloy Treatment Charge	113	19	-	46	21	20	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	26,544	100	514	963	1,213	1,402	1,025	1,300	1,526	1,437	1,409	1,297	1,242	1,346	1,344	1,287	1,156	1,277	1,419	1,317	1,168	1,108	947	749
Corporate Costs																								
Total	560	10	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Total Operating Costs																								
Total	37,524	206	751	1,410	1,693	1,906	1,432	1,821	2,067	1,969	1,939	1,818	1,758	1,870	1,869	1,807	1,665	1,797	1,950	1,840	1,678	1,613	1,439	1,225

The life of project taxes and royalties are shown in Table 19.8.

Table 19.8 Taxes and royalties by year, over life of project

	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Royalties	7,196	10	46	88	140	168	306	396	443	420	415	390	379	399	399	388	355	386	414	393	358	342	303	259
Revenue	95,890	251	1,172	2,253	3,677	4,409	3,780	4,889	5,459	5,190	5,124	4,823	4,682	4,933	4,927	4,792	4,393	4,767	5,109	4,855	4,423	4,230	3,749	3,203
Offshore OPEX	10,420	96	212	422	456	479	382	496	515	507	505	496	491	500	500	495	484	495	506	498	486	481	468	451
Offshore Depreciation	3,739	133	337	418	407	400	365	221	140	137	124	104	90	90	90	90	90	90	90	90	90	73	35	35
Offshore Markup	2,832	46	110	168	173	176	149	143	131	129	126	120	116	118	118	117	115	117	119	118	115	111	101	97
Onshore Revenue Base	78,100	- 24	513	1,245	2,641	3,354	2,883	4,029	4,673	4,417	4,369	4,103	3,985	4,226	4,219	4,090	3,704	4,066	4,393	4,150	3,732	3,566	3,145	2,620
Onshore OPEX	26,544	100	514	963	1,213	1,402	1,025	1,300	1,526	1,437	1,409	1,297	1,242	1,346	1,344	1,287	1,156	1,277	1,419	1,317	1,168	1,108	947	749
Corporate Costs	560	10	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
EBITDA	50,995	- 134	- 26	257	1,404	1,928	1,833	2,704	3,121	2,955	2,935	2,781	2,718	2,855	2,850	2,779	2,523	2,764	2,949	2,807	2,540	2,433	2,173	1,846
Onshore Depreciation	5,737	50	114	288	349	435	499	505	511	517	523	479	421	253	198	118	59	59	59	59	59	59	59	59
EBIT	45,258	- 184	- 140	- 32	1,055	1,492	1,334	2,198	2,610	2,438	2,412	2,302	2,297	2,603	2,652	2,661	2,463	2,704	2,890	2,748	2,480	2,374	2,114	1,786
Tax	9,123	-	-	-	211	298	267	440	522	488	482	460	459	521	530	532	493	541	578	550	496	475	423	357

The summary of undiscounted cash flows for the life of the project is shown in Table 19.9.

Table 19.9 Undiscounted cash flows by year, over life of project

	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Revenue	95,090	-	-	-	251	1,172	2,253	3,677	4,409	3,780	4,889	5,459	5,190	5,124	4,823	4,682	4,933	4,927	4,792	4,393	4,767	5,109	4,855	4,423	4,230	3,749	3,203
Opex	-37,524	-	-	-	206	751	1,410	1,693	1,906	1,432	1,821	2,067	1,909	1,939	1,818	1,758	1,870	1,869	1,807	1,665	1,797	1,950	1,840	1,678	1,613	1,439	1,225
Capex	-10,607	64	142	297	893	1,606	2,151	617	1,035	854	360	59	59	168	168	291	59	59	168	168	291	59	59	168	81	106	559
Taxes and Royalties	-16,318	-	-	-	10	46	88	351	467	573	835	965	908	897	850	838	920	929	920	848	927	992	943	854	817	726	616
Undiscounted Net Cashflow	30,641	64	142	297	859	1,291	1,395	1,015	1,002	921	1,872	2,368	2,254	2,120	1,986	1,795	2,084	2,070	1,897	1,712	1,752	2,107	2,013	1,722	1,719	1,478	803
Cumulative Undiscounted Cashflow		64	206	503	1,361	2,652	4,047	3,032	2,031	1,110	762	3,130	5,384	7,503	9,490	11,284	13,368	15,438	17,335	19,047	20,799	22,906	24,919	26,641	28,360	29,838	30,641

19.3 Inferred Mineral Resources

The IA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the IA will be realized.

The LOM production sequence includes 6 Mt (wet) of nodules that are classified as Inferred Mineral Resources. This is approximately 2% of the total LOM production. Excluding the Inferred Mineral Resources from the economic analysis the project NPV is estimated to be $6.7 billion.

19.4 Sensitivity analysis

The sensitivity of project economics to changes in the main variables was tested by selecting high and low values that represent a likely range of potential operating conditions.

In terms of identifying high and low ranges:

- Grade and abundance ranges were based on the distribution throughout the resource.
- Onshore capital cost ranges were based on accuracy levels of +50%, -35%.
- Offshore capital cost ranges were based on Deep Reach Technology's accuracy levels of +40%, -30%.
- Other capital cost ranges were +/- 25%.
- Note, the collector speed is already at the BOD maximum of 0.5 m/s, so there was no high case value tested.
- Metal recoveries were based on realistic high and low values.
- For other variables ranges were +/- 20%.

The sensitivity analysis inputs are listed in Table 19.10. The impact of each variable on NPV (tested individually) is shown in Figure 19.4. The results are asymmetric for some variables. The variables with the biggest negative impact on NPV are all metal prices, total OPEX, collector speed, nickel sulphate price and development CAPEX. In general, revenue drivers have the biggest impact, followed by OPEX variables and then CAPEX variables.

Figure 19.4 Tornado diagram of NPV sensitivity to variables

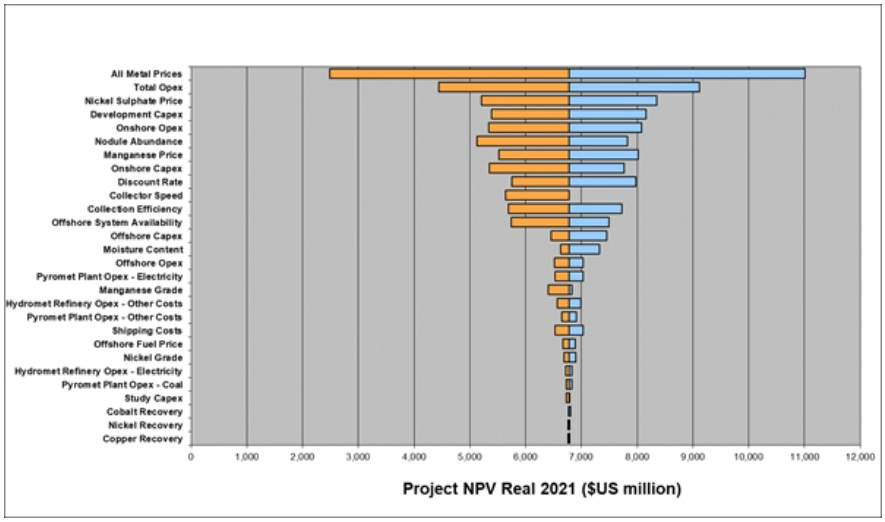


Table 19.10 Sensitivity analysis inputs

Parameters	Units	Values			Variation from Central Case Value	
		Low Case Value	Central Case Value	High Case Value	Low Case Value	High Case Value
Production and Revenue Parameters						
Nickel Grade	%	1.37	1.39	1.42	-1%	+2%
Manganese Grade	%	29.0	31.0	31.3	-6%	+1%
Nodule Abundance	kg/m^2	15.5	16.9	22.5	-15%	+16%
Collector Speed	m/sec	0.40	0.50	N/A	-20%	N/A
Collection Efficiency	%	81	90	99	-10%	+10%
Offshore System Availability	days/year	190	238	286	-20%	+20%
Moisture Content	%	25	24	20	+4%	-17%
Nickel Recovery	%	92.5	94.6	96.0	-2%	+1%
Copper Recovery	%	79.5	86.2	89.0	-8%	+3%
Cobalt Recovery	%	74.0	77.2	88.0	-4%	+14%
All Metal Prices					-20%	+20%
Nickel Sulphate Price	$US/t	$14,169	$17,711	$21,254	-20%	+20%
Manganese Price	$US/DMTU	$3.62	$4.53	$5.44	-20%	+20%
CAPEX Parameters						
Development CAPEX	$US Million	$9,338	$7,470	$5,603	+25%	-25%
Study CAPEX	$US Million	$296	$237	$177	+25%	-25%
Offshore CAPEX	$US Million	$3,427	$2,448	$1,713	+40%	-30%
Onshore CAPEX	$US Million	$7,179	$4,786	$3,111	+50%	-35%
Total CAPEX	$US Million	$13,259	$10,607	$7,955	+25%	-25%
OPEX Parameters						
Total OPEX	$US/tonne nodule (dry)	$232.9	$194.1	$155.3	+20%	-20%
Offshore OPEX	$US/tonne nodule (dry)	$32.0	$26.7	$21.4	+20%	-20%
Onshore OPEX	$US/tonne nodule (dry)	$164.8	$137.3	$109.8	+20%	-20%
Offshore Fuel Price	$US/tonne fuel	$600.0	$500.0	$400.0	+20%	-20%
Shipping OPEX	$US/tonne nodule (dry)	$32.7	$27.2	$21.8	+20%	-20%
Pyro Plant OPEX - Other Consumables	$US Million per RKEF line per annum	$96.3	$120.4	$144.5	+20%	-20%
Pyromet Plant OPEX – Electricity	$US Million per RKEF line per annum	$267.6	$223.0	$178.4	+20%	-20%
Pyromet Plant OPEX - Coal	$US Million per RKEF line per annum	$56.8	$47.3	$37.8	+20%	-20%
Hydromet Refinery OPEX - Electricity	$US Million per refinery per annum	$31.9	$26.6	$21.3	+20%	-20%
Hydromet Refinery OPEX - Other Costs	$US Million per refinery per annum	$120.7	$100.6	$80.5	+20%	-20%
Economic Parameters						
Discount Rate	%	10	9	8	+11%	-11%

20 Adjacent properties

The NORI Area lies within the Clarion Clipperton Zone. Seafloor polymetallic nodules are distributed across the majority of the CCZ. Sections 7 and 20 discuss the relationship of the NORI Area to the other properties in the CCZ.

In 2020, DeepGreen acquired the polymetallic nodule exploration contract awarded by the ISA to TOML. TOML Area F is immediately west of NORI Area D.

21 Other relevant data and information

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22 Interpretation and conclusions

Exploration by several government-funded organisations and commercial consortia (the Pioneer Investors) from the 1960s onwards demonstrated a very large resource of polymetallic nodules, containing nickel, manganese, cobalt, and copper, located on the deep seafloor the CCZ, in the northeast Pacific Ocean between Hawaii and Mexico.

The nodules are located at depths of between 4,000 and 6,000 m and have been explored with considerable success using a variety of deep-sea technologies. Successful trial extraction in the CCZ has also been carried out to demonstrate that the nodules can be collected and pumped to a surface platform and subsequently processed to recover metals.

Exploration of the seafloor in international waters is now administered by the ISA and regulated by the UNCLOS. These institutions operate on the principle that the ocean floor beyond the limits of national jurisdiction, known as the Area, is the common heritage of mankind.

In July 2011, Nauru Ocean Resources Inc. (NORI), a subsidiary of DeepGreen Metals Inc. (DeepGreen), was granted an exploration contract over 74,830 km^2 in the CCZ consisting of four exploration areas (A, B, C and D) (the NORI Area or the Property). NORI's contract for exploration of polymetallic nodules was approved by the Council of the ISA on 19 July 2011, for a term of 15 years and then signed with the ISA on 22 July 2011.

NORI completed off-shore exploration campaigns in 2012, 2013, 2018, and 2019. During these campaigns a variety of data was collected including:

- Bathymetric mapping of the whole of NORI Area D using a hull-mounted MBES.
- Detailed seafloor survey work with an AUV, utilising an MBES, Side Scan Sonar (SSS), Sub-Bottom Profiler (SBP) and camera payload.
- Box core samples.

During this period NORI commissioned a variety of preliminary scientific and engineering studies into the exploitation of polymetallic nodules, with the primary focus on NORI Area D.

22.1 Mineral Resources

All the data indicates that both grades and abundance have remarkable continuity. Abundance is more variable than grades and is recognised as the primary control on classification of the Mineral Resource. Sufficient data was collected in NORI Area D to estimate Measured and Indicated Resources and define an area that is expected to be suitable for a trial of a mining system.

Sampling of NORI Area D at a spacing of 10 km by 10 km during the 2019 campaign confirmed that the nodules have low variability and high continuity. The latest Mineral Resource estimate (2020) is 4 Mt Measured and 341 Mt Indicated and 11 Mt Inferred Mineral Resources. Taking into account the conversion of the majority of Inferred to Indicated Mineral Resources, the remaining Inferred Mineral Resource has decreased by 26 Mt as a result of excluding the Volcanic High domain in the south-eastern corner of NORI Area D, due to uncertainty about the occurrence of nodules in this area. The 2020 resource estimate is also slightly higher in abundance (5.4% higher), and nickel (6.1% higher), cobalt (5.4% higher) and manganese (2.2% higher) grades than the 2018 estimate.

Comparison of the area covered by Inferred, Indicated and Measured Mineral Resource for the 2020 estimate and the same area in the 2018 model shows that nickel grade has increased by 6% (1.32% to 1.40% Ni) while abundance has increased by 6% (16.0 to 17.0 kg/m^2). Mineral Resource tonnage has increased by 10% (from 10 to 11 Mt) in the Inferred area and 7% (from 320 to 341 Mt) in the Indicated area. The positive conversion rates arising from infilling the sampling grid with high-quality box core sample data (rather than extending the area sampled) are exceptionally high compared to the typical outcomes from infill sampling of terrestrial mineral deposits.

Whilst the IA focusses on the development of nodule production in NORI Area D, the other three areas (NORI Area A, B and C), are estimated to contain Inferred Mineral Resources of 510 Mt (wet) at 1.28% Ni, 0.21% Co, 1.04% Cu, 28.3% Mn, at an average abundance of 11 kg (wet)/m^2 at a 4 kg/m^2 abundance cut-off (Golder, 2013). The polymetallic nodule mineralisation in Areas A, B and C has similar characteristics to NORI Area D and it is likely that the technology proposed in the IA would be suitable for these additional areas.

22.2 Development plan

NORI proposes to implement the project in multiple phases that will allow the seafloor mining systems to be tested and then nodule production to be gradually ramped up. The phased approach will facilitate derisking of the project for relatively low initial capital investment. The proposed development phases are as follows:

- The Collector Test is designed to perform proof of concept for the methods of collecting and lifting the nodules while acquiring sufficient data to design a commercial system. Nodule collected during the test would be stored on the Hidden Gem and brought to shore for use in large scale process pilot testing. The Collector Test would use a converted sixth generation drillship, the Hidden Gem. The test would not demonstrate the transhipment of nodules to a shore-based facility.

- Project Zero would be an extension of the Collector Test using an upgrade of the converted drillship to produce a sufficient and continuous quantity of nodules to support a relatively small commercial operation of up to 1.3 Mtpa (wet) nodules delivered to a shore-based facility. This operation would demonstrate a more continuous mining operation at a larger scale than the Collector Test and would demonstrate the transhipment of nodules to a processing facility.

- Project One would increase production in a further three steps:

    — a further upgrade of the Hidden Gem for up to 3.6 Mtpa (wet) production, for a 20-year production life.

    — introduction of a second converted drillship (Drill Ship 2) with a capacity of up to 3.6 Mtpa (wet), designed for a 20 year production life.

    — construction of a new purpose-built production support vessel (Collector Ship 1) with capacity of up to 8.2 Mtpa (wet). Project One would benefit from lessons learned on the Collector Test and Project Zero.

NORI proposes that the processing of the polymetallic nodules would also be ramped up in phases. For Project Zero, NORI proposes to toll treat polymetallic nodules at existing RKEF smelters, utilizing excess industry capacity. In Project One, a purpose-built process plant would be constructed, including pyrometallurgical and hydrometallurgical circuits. Much of the nodule production would switch in phases from toll-treatment to treatment in this new plant. A portion of the nodule production would continue to be toll treated.

22.3Off-shore operations

Preliminary design of an off-shore nodule collection system has been completed. The main items of off-shore infrastructure are the nodule collector vehicles, the riser, the production support vessel (PSV), and a collector support vessel.

The seabed system is an extrapolation of existing technologies in deep ocean operations and previous seabed development activities. Much of the technology is a direct derivative of previous experience in nodule developments, such as consortium activities in the 1970s, including significant pilot testing, and also advances in deep water oil and gas development.

The nodules will be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection.

The collectors will be remotely controlled and supplied with electric power via umbilical cables from the PSV. They nodules will be pumped as a slurry via flexible hoses to a riser, through which they will be transferred to the surface by means of an air lift. Nodules will be discharged to the PSV, where they will be dewatered and temporarily stored or transferred directly to ore transportation vessels. A separate collector support vessel will remain at sea to support the mining operation.

This IA assumes transportation of nodules will be by chartered vessels with deadweight capacities of up to 100,000 tonnes. The vessels will require DP capability to enable them to be loaded at sea alongside the PSV. Hydraulic offloading of the nodules from the PSV to the transport ships is assumed in this IA, but future studies will confirm the offloading mechanism.

There still remain particular component and sub-systems of the off-shore operations that are not “off-the-shelf” and require further development. The technical readiness of some of the described components and assumptions need to be verified by further design and testing. NORI plans to complete a Collector Test in 2022 which will address these issues.

22.4 On-shore operations

The overall flowsheet for the on-shore operations, i.e. smelting and sulphuric acid leach, is one of the options that have been considered in the literature. The first part of the pyrometallurgical process is the Rotary Kiln Electric Furnace (RKEF) process that is widely used in the nickel laterite industry. The second pyrometallurgical step (sulphidisation of the alloy produced in the first step to form a matte and then partially conversion in a Peirce-Smith converter to remove iron), while not widely practiced, also has commercial precedent at the Doniambo plant of Societe Le Nickel in New Caledonia.

Sulphuric acid leaching of matte from the pyrometallurgical process has precedent in the platinum group minerals (PGM) industry. Although copper producers typically have a solvent extraction step before electrowinning of their copper, direct copper electrowinning is done in most PGM refineries, where nickel and cobalt are also significant pay-metals. This is to maximise nickel recovery and minimise operating expenses. The nickel and cobalt are purified using solvent extraction, ion exchange and precipitation, which are all commercially proven hydrometallurgical processes. Battery grade nickel and cobalt sulphate are then crystallised from the purified solutions.

The pyrometallurgical process forms two by-products as well as the matte for the hydrometallurgical refinery:

- Electric furnace silicate product containing silica and 53% MnO that is intended to be sold as feed to the Si-Mn industry.
- A converter aisle slag that could be used for aggregate in road construction or other applications.

The hydrometallurgical refinery generates iron residues that would, for a stand-alone plant, require disposal. However, these streams can be recycled back to the pyrometallurgical plant for re-treatment and recovery of entrained pay metals.

Selection of ammonia as a principal reagent in the hydrometallurgical refinery means that an additional by-product—ammonium sulphate—is generated. This could be sold into the fertiliser industry.

The copper cathode quality from direct electrowinning, without a solvent extraction step, is expected to be ≥99.9% Cu. Quality of the matte produced in the pyrometallurgical plant will have an impact on this, including the potential carryover of impurities beyond values assumed for the purpose of the IA.

The production of battery-grade nickel and cobalt sulphates is targeted instead of nickel or cobalt cathodes or other intermediate products.

In summary:

- All parts of the proposed process have commercial precedents in similar or analogous industries, however not as a whole continuous flowsheet.
- Pay-metals are recovered in the following forms:
  - Copper cathodes with an expected quality of ≥99.9% Cu.
  - Battery-grade nickel sulphate.
  - Battery-grade cobalt sulphate.
- Rather than generating large waste streams, the process produces by-products including high manganese content furnace slag and ammonium sulphate.

The process assumptions used in this study will need to be verified as the project proceeds.

22.5 Environmental status

Historically, a significant amount of technical work has been undertaken within the CCZ by the Contractors and a significant body of information has been acquired during the past 40 years on the likely environmental impacts of collecting nodules from the sea floor.

NORI's off-shore exploration campaigns have included sampling to support environmental studies, collection of high-resolution imagery and environmental baseline studies. A number of future campaigns are planned to collect data on ocean currents and water quality to assist plume modelling, environmental baseline studies, box core and multicorer sampling focussed on benthic ecology and sediment characteristics.

NORI has commenced the ESIA process in support of an application for an exploitation license for the commercial mining of deep-sea polymetallic nodules. A comprehensive program of metocean and biological data acquisition is in progress to characterize the baseline conditions at a designated Collector Test site and control sites in the mining lease area.

NORI intends to manage the Project under the governance of an EMS, which is to be developed in accordance with the international EMS standard, ISO 14001:2004. The EMS will provide the overall framework for the environmental management and monitoring plans that will be required.

An EMP will be required. The plan will specify the objectives and purpose of all monitoring requirements, the components to be monitored, frequency of monitoring, methods of monitoring, analysis required in each monitoring component, monitoring data management and reporting. The plan will be submitted to the ISA as part of the exploitation contract application.

The social impacts of the off-shore operation are expected to be positive. The CCZ is uninhabited by people, and there are no landowners associated with the NORI Area D nodule project. No significant commercial fishing is carried out in the area. The Project will provide a source of revenue to the sponsor country, Nauru, and to the ISA.

The on-shore environmental and social impacts have not yet been assessed because the process plant has not been designed in detail, and the location and host country (and hence regulatory regime) not confirmed. The Project is not expected to require tailings ponds or other large-scale waste storage on-site. The deleterious elements (for example, cadmium and arsenic) content of the nodules is very low, indicating that with careful management the environmental impacts of the processing operation could be very low.

22.6 Economic analysis

The cost estimates used in this IA for off-shore property, plant and equipment are based on estimates prepared by Deep Reach Technology Inc. (DRT) for NORI during the 2015 DRT scoping study. These were generally derived from budget estimates supplied by original equipment manufacturers that specialise in each of the items under consideration.

The estimates assume that the technologies proposed will be technically ready at the time the capital is spent. While much of the proposed technology is derived from previous experience in nodule development and from existing oil and gas technology, the concepts include substantial research and development, customisation, and bespoke engineering. Specific items that require development include field testing of collectors, airlift discharge systems, nodule attrition simulation; a mateable power connector in the megawatt range capable of operating at 5,000 m depth must be qualified. Accordingly, a budget allowance has been made for prefeasibility activities prior to commercial development of the project. A contingency of 25% has been applied to the off-shore capital cost estimates.

On-shore capital costs were estimated according to an Association for the Advancement of Cost Engineering Class 5 level of accuracy (–35% +50%). A contingency of 32% has been applied to the on-shore capital cost estimates. Owner's costs and escalation beyond 2019 are excluded.

Transportation cost estimates to an unspecified Mexican port are based on estimates by Global Location Strategies (Global Location Strategies, 2019) for NORI. The destination port has not yet been determined, nor has the location of the processing plant. Hence, the overland transport requirement cannot yet be estimated. Different vessel sizes will be considered in future studies.

The IA considers a mining plan for a 23-year production period. The draft regulations for exploitation of Mineral Resources in the Area (ISBA/23/LTC/CRP.3*), promulgated by the ISA, contemplate grant of an initial 30-year exploitation contract, with possible extension by periods of 10-years, subject to license re-applications and renewals. After the initial 23-year period substantial resources will remain in the other NORI Areas (A, B, and C) that could support future mining.

A financial model based on estimates of future cash flows derived from extraction of nodules from NORI Area D has been developed in-house by DeepGreen. AMC reviewed the logic, input assumptions and integrity of the calculations and forecasts and is satisfied that the outcomes of the model are reasonable for a IA.

The analysis indicates a positive economic outcome. Undiscounted post-tax net cash flow of US$30.6 billion is expected. An internal rate of return of 27% has been modelled. Discounted cash flow analysis of unleveraged real cash flows, discounting at 9% per annum, indicates a project net present value (NPV) of US$6.8 billion. Excluding the inferred mineral resources from the economic analysis, the post-tax project NPV is estimated at $6.7 billion, which is not a significant difference from the economic analysis that includes the inferred mineral resources.

The Qualified Persons caution that this IA is preliminary in nature. There is no certainty that the results presented in this IA will be realised. A prefeasibility study has not been undertaken. Mineral Resources are not mineral reserves and do not have demonstrated economic viability.

23 Recommendations

This IA indicates that the NORI Area D resource is potentially economic. The QPs recommend that further data gathering, analysis, design and cost estimation be undertaken to advance the Project.

The priorities should be undertaking the environmental baseline studies and compiling the ESIA required to facilitate timely permitting; obtaining a bulk sample of nodules for metallurgical testing and flowsheet optimisation; and the Collector Test to demonstrate proof of concept and to provide performance data to inform detailed engineering design.

Assuming these activities generate positive results, a prefeasibility study will be warranted.

DeepGreen has identified a program to advance the NORI Area D Project Figure 19.1. The program incorporates the activities recommended by the QPs. It also includes fabrication, commissioning and wet testing of long lead items required for the Collector Test, which is currently scheduled for Q2-3 2022.

Pre-project capital cost estimates, which cover these activities, are summarized in Table 18.2.

NORI estimates $70.6 million in pre-Project off-shore capital costs including $40 million for feasibility studies and engineering design. Approximately $60 million expenditure is expected for successful engineering, fabrication and completion of the Collector Test.

24 References

Agarwal JC, Barner HEM, Beecher N. 1979. The cuprion process for ocean nodules, Chem. Eng. Prog 75(1):59-63.

Agarwal, S., et al, 2009. Studies on recovery of Ni, Co, Cu from polymetallic polymetallic nodules by direct reduction smelting, COM 2009, Sudbury, p. 509-517.

Allain V, Nicol S, Essington T, Okey T, Olson B, Kirby D 2007. An Ecopath with Ecosim model of the Western and Central Pacific Ocean warm pool pelagic ecosystem. Western and Central Pacific Fisheries Commission, Scientific Committee, Third Regular Session, 13-24 August 2007 Honolulu, United States of America. WCPFC-SC3-EB SWG/IP-8.

AMC, 2016. TOML Clarion Clipperton Zone Project, Pacific Ocean. Technical Report compiled under NI-43-101 by AMC Consultants Pty Ltd for Nautilus Minerals, March 2016.

AMC, 2018. Initial Assessment of Solwara Project, Bismark Sea, PNG, Technical Report compiled under NI-43-101 by AMC Consultants Pty Ltd for Nautilus Minerals Niugini Ltd.

AMC, 2018. NORI Area D, Clarion Clipperton Zone Mineral Resource Estimate, April 2019 Technical Report compiled under NI-43-101 by AMC Consultants Pty Ltd for DeepGreen Metals Inc.

American Society of International Law. 1975. DeepSea Ventures Inc: notice of discovery and claim of exclusive mining rights, and request for diplomatic protection and protection of investment. International Legal Materials 14(1) (January 1975): 51-68.

Amon DJ, Ziegler AF, Dahlgren TG, Glover AG, Goineau A, Gooday AJ, Wiklund H, Smith CR, 2016. Insights into the abundance and diversity of abyssal megafauna in a polymetallic-nodule region in the eastern Clarion-Clipperton Zone. Sci. Rep. 6, 30492.

Amon DJ, Ziegler AF, Kremenetskaia A, Mah CL, Mooi R, O'Hara T, Pawson DL' Roux M and Smith CR. 2017. Megafauna of the UKSRL exploration contract area and eastern Clarion-Clipperton Zone in the Pacific Ocean: Annelida, Arthropoda, Bryozoa, Chordata, Ctenophora, Mollusca. Biodiversity Data Journal 5: e14598 doi: 10.3897/BDJ.5.e14598.

ANZECC/ARMCANZ 2000. Australia and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council/ Agricultural and Resource Management Council of Australia and New Zealand. Canberra.

Arbizu P, Haeckel M 2015. RV SONNE Fahrtbericht / Cruise Report SO239 EcoResponse Assessing the Ecology, Connectivity and Resilience of Polymetallic Nodule Field Systems. The GEOMAR Helmholtz Centre for Ocean Research Kiel, Geomar Report 25.

Barnes, A., et al., 2011. Cobalt from slag – Lessons in transition from laboratory to industry, COM 2011, Montreal.

Bath, A. R. (1989), "Deep Sea Mining Technology: Recent Developments and Future Projects", Off-shore Technology Conference, Paper OTC 5998, Houston, Texas USA

Bernard, J., Bath, A. and Greger, B. (1987), "Analysis and Comparison of Nodule Hydraulic Transport Systems", Proceedings, Off-shore Technology Conference, paper OTC 5476, Houston

BGR 2018. Environmental Impact Assessment for the testing of a pre-protoype manganese nodule collector vehicle in the Eastern German license area (Clarion-Clipperton Zone) in the framework of the European JPI-O Mining Impact 2 research project.

Bertrand A, Bard F-X and Josse E, 2002. Tuna food habits related to the micronekton distribution in French Polynesia. Marine Biology 140: 1023-1037.

Bluhm H 2001. Re-establishment of an abyssal megabenthic community after experimental physical disturbance of the seafloor. Deep sea research 11(48):3841-3868.

Boschen RE, Collins PC, Tunnicliffe V, et al. 2015. A primer for use of genetic tools in selecting and testing the suitability of set-aside sites protected from deep-sea seafloor massive sulphide mining activities. Ocean & Coastal Management 122: 37-48.

Bosland, R. (2020, November 27). Email Subject: RE: Client Query No. 3A - Request for Info. Delft.

Brockett, F.H., Kollwentz, Walter M. (1977), “An International Project - Nodule Collectors”, Off-shore Technology Conference, paper 2777 Houston, Texas.

Bustos, A., et al., 1988.Converting simulation at Falconbridge Limited”, Extractive metallurgy of nickel and copper, TMS, p. 335-53.

Castro P and Huber ME, (Eds) 2005. Marine Biology. 5th Edition, McGraw Hill Publishers New York ISBN0-07-250934-1.

Cellula Robotics Ltd. (2015). Production Harvestor Design Report DCD15 CTR01/03.

Choy CA, Haddock SHD, Robison BH 2017 Deep pelagic food web structure as revealed by in situ feeding observations. Proc. R. Soc. B 284: 20172116. http://dx.doi.org/10.1098/rspb.2017.2116.

Clark M, Smith S 2013. Environmental management considerations. In: SPC 2013, Baker E, Beaudoin Y, editors. Deep sea minerals: manganese nodules, a physical, biological, environmental, and technical review. Vol. 1B, Secretariat of the Pacific Community. p. 27–38.

Clark MR, Rouse H, Lamarche G, Ellis J, Hickey C. 2017. Preparation of Environmental Impact Assessments: General guidelines for off-shore mining and drilling with particular reference to New Zealand. NIWA Science & technology Series. January 2007.

Clark MR, Durden JM and Christiansen S. 2019. Environmental Impact Assessments for deep-sea mining: Can we improve their future effectiveness? Marine Policy.

Clarke KR and Warwick RM, 1994. Change in marine communities: An approach to statistical analysis and interpretation. Plymouth Marine Laboratory, UK.

CRU, 2020. Updated PEA market input. Report for DeepGreen Metals. Dated 23/10/2020.

Crundwell, F., et al., 2011. “Extractive metallurgy of nickel, cobalt and platinum group metals”, Elsevier, p. 103.

Cutter A 2018. US GEOTRACES Pacific Meridional Transect – GP15 Cruise Report 18 September – 24 November 2018. Seattle, Washington – Papeete, Tahiti (port stop in Hilo, Hawaii, 21-25 October 2018) R/V Roger Revelle. Available at geotraces.org.

Deep Reach Technology, Inc. (DRT) (2015) “Seafloor Polymetallic Nodule Off-shore Scoping Study – Technical Report”, Report DRT-1412-RP-02-R02, 29 October 2015.

Deep Reach Technology, Inc. (2019). Theory and Validation of the DRT Airlift Model DRT-1907-RP-02-C01. Houston: Deep Reach Technology, Inc.

Deep Reach Technology, Inc. (2020). Drillship Conversion for Project Zero DRT-2009-RP-02-R01. https://www.deepreachtech.com/arpa-e-sbir-news-release

Deep Reach Technology, Inc. (2021). Improved Manganese Nodule Collector Design to Mitigate Sediment Plumes - Final Report Phase 1. Houston: Advanced Research Project Administration - Energy, U. S. Department of Energy.

Demidova T 1999. The Physical Environment in Nodule Provinces of the Deep Sea. In: Deep-seabed polymetallic nodule exploration: development of environmental guidelines. Proceedings of the International Seabed Authority's Workshop held in Sanya, Hainan Island, People's Republic of China. June 1-5, 1998 (ISA/99/02). p. 79-116.

Demidova TA, Kontar EA 1989. On bottom boundary currents in the areas of development of manganese nodule deposits. Doklady Akademii Nauk SSSR 2(308):468-472.

De Smet B, Pape E, Riehl T, Bonifacio P, Colson L, Vanreusel A 2017. The Community Structure of Deep-Sea Macrofauna Associated with Polymetallic Nodules in the Eastern Part of the Clarion-Clipperton Fracture Zone. Front. Mar. Sci., 11 April 2017, https://doi.org/10.3389/fmars.2017.00103.

Diaz, C., et al., "A review of nickel pyrometallurgical operations" Extractive metallurgy of nickel and copper, TMS, 1988, p. 211-39.

Doyle, RL. and Halkyard, JE. (2007), "Large Scale Airlift Experiments for Application to Deep Ocean Mining", ASME, Proceedings of the 26th International Conference on Off-shore Mechanics and Arctic Engineering, OMAE 2007, June, San Diego, CA.

Drazen JC, Sutton TT, 2017. The feeding ecology of deep-sea fish. Annual Reviews Marine Science 9: 337-366.

Drazen JC, Leitner A, Morningstar S, Marcon Y, Greinert J, Purser A 2019a. Observations of deep-sea fishes and mobile scavengers from the abyssal DISCOL experimental mining area. Biogeosciences Discussions. https.//dio.org/10.5194/bg-2019-51.

Drazen J, Smith C, Gjerde K, Au W, Black J, Carter G, Clark M, Durden J, Dutrieux P, Goetze E, Haddock S, Hatta M, Hauton C, Hill P, Koslow J, Leitner A, Measures C, Pacini A, Parrish F, Peacock T, Perelman J, Sutton T, Taymans C, Tunnicliffe V, Watling L, Yamamoto H, Young E, Ziegler A 2019b. Report of the workshop Evaluating the nature of midwater mining plumes and their potential effects on midwater ecosystems. Research Ideas and Outcomes 5: e33527. https://doi.org/10.3897/rio.5.e33527.

Durden JM, Bett BJ, Jones DOB, Huvenne VAI, Ruhl HA, 2015. Abyssal hills – hidden source of increased habitat heterogeneity, benthic megafaunal biomass and diversity in the deep sea. Progress in Oceanography 137: 209-218.

Dymond J, Collier R 1988 Biogenic particle fluxes in the equatorial Pacific: evidence for both high and low productivity during the 1982-83 El Nino. Global Biogeochem. Cycles 2:129-137.

Earney FCF. 1990. Marine Mineral Resources. Routledge, p 387. Cited in: ISA. 2010. A geological model of polymetallic nodule deposits in the Clarion-Clipperton Fracture Zone and prospector's guide for polymetallic nodule deposits in the Clarion-Clipperton Fracture Zone. International Seabed Authority Technical Study: No. 6.

Ekstrom J, Bennun L and Mitchell R. 2015. A cross-sector guide for implementing the Mitigation Hierarchy. Cross Sector Biodiversity Initiative, Cambridge.

ERIAS 2018. NORI Area D, Campaign 3, Sediment Geochemistry Characterisation Report. Report prepared by ERIAS Group Pty Ltd for Maersk Supply Service/Nauru Ocean Resources Inc. Draft, December 2018.

Food and Agriculture Organization 2009. Management of Deep-sea Fisheries in the High Seas, FAO, Rome, Italy, 2009.[17]

Food and Agriculture Organization 2018. FAO Yearbook of Fishery and Aquaculture Statistics. http://www.fao.org/fishery/static/Yearbook/YB2018_USBcard/index.htm.

Feenan, J. P. (2009) “Seafloor Massive Sulphide Mining Concept”, Off-shore Technology Conference, Paper 19823, Houston, Texas USA.

Fernandez-Alamo MA and Farber-Lorda J, 2006. Zooplankton and the oceanography of the eastern tropical Pacific: A review. Progress in Oceanography, 69: 318-359.

Felix, D. 1980. Some problems in making nodule abundance estimates from seafloor photographs. Marine Mining, Volume 2 Number 3, 293-302.

Flanagan and Gottfried, 1980. USGS nodule standard.

FRED, 2020. Producer Price Index by Industry: Ship Building and Repairing: Ship Repair, Nonmilitary (PCU336611336611A) | FRED | St. Louis Fed.

Fugro. (2019). Geotechnical Seafloor Sampling Survey: NORI Area D Area, Campaign 3; Report No. 1803-1344, Volume II Revision 0. Houston Texas: Fugro USA, Marine, Inc.

Giere O, 1993. Meiobenthology. Springer, Berlin. p. 328.

Gill AE. 1982. Atmosphere-ocean dynamics. New York: Academic Press. In Demidova T. 1999. The Physical Environment in Nodule Provinces of the Deep Sea. In: Deep-seabed polymetallic nodule exploration: development of environmental guidelines. Proceedings of the International Seabed Authority’s Workshop held in Sanya, Hainan Island, People’s Republic of China. June 1-5, 1998 (ISA/99/02).

Global Location Strategies, 2019. Deep Green Global Location Benchmarking Final Report. Report for DeepGreen, dated August 20, 2019.

Golder 2013. NI 43-101 technical report; Clarion-Clipperton Zone Project, Pacific Ocean. Report by Golder Associates Pty Ltd for Deep Green Resources Inc.

Golder 2015. Preliminary economic assessment, NORI Clarion-Clipperton Zone Area D Project, Pacific Ocean. Report prepared by Golder Associates for Deep Green Resources Inc.

GSR 2018. Global Sea Mineral Resources NV 2018. Environmental Impact Statement. Small-scale testing of nodule collector components on the seafloor of the Clarion-Clipperton Fracture Zone and its environmental impact (ISA_EIA_2018_GSRNOD2019)

Guenette S, Christensen V, Pauly D 2008. Trophic modelling of the Peruvian upwelling system: Towards reconciliation of multiple datasets. Progress in Oceanography 79: 326-335.

Halbach PE, Abram A 2013. Study Report about the surface sediments in the NE Pacific Clarion-Clipperton Zone (CCZ): Type of sediments, mineral and chemical composition and soil mechanical results of the surface layers. Prepared for DeepGreen Resources Inc. by FU Berlin. September 2018.

Hauquier F, Macheriotou L, Bezerra TN, Egho G, Martínez P, Arbizu PM, Vanreusel A 2018. Geographic distribution of free-living marine nematodes in the Clarion-Clipperton Zone: implications for future deep-sea mining Scenarios. Biogeosciences Discuss., https://doi.org/10.5194/bg-2018-492.

Hayes SP 1979. Benthic current observations at DOMES Sites A, B, and C in the tropical North Pacific Ocean. In: Bischoff YL, Piper DZ, editors. Marine geology and oceanography of the central Pacific manganese nodule province. New York: Plenum Press. 83-112.

Haynes BW, 1985. Laboratory processing and characterization of waste materials from manganese nodules, USBM RI 8938.

Hayton, B (2015) “Production Collector Design Report”, Cellula Robotics, Ltd. Report CRL-DCD15-RP-09, 24 Dec.

Hein J, Mizell K, Koschinsky A, Conrad T. 2013. Deep-ocean mineral deposits as a source of critical metals for high- and green-technology applications: comparison with land-based resources. Manuscript Number: ORGEO-D-12-00079.

Heine, O. R. (1976), “Existing Large-Scale Air Lift Mining Operation and Air Lift Engineering Effort in the Soviet Union”, Kennecott Exploration, Inc. Report TM-76-570

Hennigar, HF, Dick, RE, and Foell EJ, 1986, Derivation of Abundance Estimates for Manganese Nodule Deposits: Grab Sampler Recoveries to Ore Reserves, Off-shore Technology Conference, OTC 5237, May 1986, Houston.

Herring PJ, 2001. The Biology of the Deep Ocean. Oxford University Press, Oxford, England. ISBN-13: 978-0198549550

Higgins RP and Thiel H, (Eds) 1988. Introduction to the study of meiofauna. Smithsonian Institution Press. Washington DC.

Hofirek, Z. et al., 1995. Pressure leach capacity expansion using oxygen-enriched air at RBMR Rustenburg Base Metal Refiners, Hydrometallurgy, 39, pp 91-116.

Holness S, Stephens A, Ginsburg A, Botts EA, Driver A, Manuel J, & Mohasoa, P. 2018. Bridging the research-implementation gap: Mainstreaming biodiversity into the South African mining sector. Bothalia-African Biodiversity & Conservation, 48(1), 1-7.

IATTC 2019, https://www.iattc.org/PDFFiles/FisheryStatusReports/_English/No-17-2019

IFC 2013. Good Practice Handbook Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets. International Finance Corporation.

IHS Markit, 2021. Costs and Technology Indexes, accessed February 2021. https://ihsmarkit.com/Info/cera/ihsindexes/index.html

ISA, 1999a. Deep-seabed polymetallic nodule exploration: development of environmental guidelines. Proceedings of the International Seabed Authority’s Workshop held in Sanya, Peoples Republic of China, June 1-5, 1998.

ISA. 1999b. Proposed technologies for mining deep-seabed polymetallic nodules. Proceedings of the International Seabed Authority’s Workshop held in Kingston, Jamaica, 3-6 August 1999.

ISA. 2002. Standardisation of Environmental Data and Information: Development of Guidelines; Proceedings of the International Seabed Authority’s Workshop, Kingston, Jamaica, June 25-29, 2001. Kingston Jamaica: Office of Resources and Environmental Monitoring, International Seabed Authority (ISA/02/02).

ISA. 2003. Establishment of a geological model of the polymetallic nodule resources in the Clarion- Clipperton Fracture Zone of the Equatorial North Pacific Ocean. Proceedings of the May 13-20, 2003, International Seabed Authority workshop held in Nadi, Fiji.

ISA. 2004. Marine Mineral Resources - scientific advances and economic perspectives. United Nations Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs.

ISA, 2008., Report on the International Seabed Authority's workshop on polymetallic nodule mining technology: current status and challenges ahead. Summary of Feb. workshop prepared by ISA Secretariat, Chennai, India.

ISA, 2010. A Geological Model of Polymetallic Nodule Deposits in the Clarion-Clipperton Fracture Zone and Prospector's Guide for Polymetallic Nodule Deposits in the Clarion- Clipperton Fracture Zone. International Seabed Authority Technical Study: No. 6 ISBN: 978-976-95268-2-2.

ISA, 2010. Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for polymetallic nodules in the Area. ISBA/16/LTC/7. Issued by the Legal and Technical Commission.

ISA, 2012a. Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals. Kingston Jamaica: International Seabed Authority (ISA Technical Study No. 10).

ISA, 2012b. Decision of the Council relating to an environmental management plan for the Clarion- Clipperton Zone. Kingston Jamaica: International Seabed Authority. (ISBA/18/C/22; 26 July 2012).

ISA, 2013. Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area. ISBA/19/LTC/8. Issued by the Legal and Technical Commission.

ISA, 2014a. Deep sea macrofauna of the Clarion-Clipperton Zone. Kingston Jamaica: International Seabed Authority (ISA Technical Study No. 13).

ISA, 2014c. Developing a Regulatory Framework for Mineral Exploitation in the Area - Stakeholder Engagement.

ISA, 2015. Deep Sea Macrofauna of the Clarion-Clipperton Zone Taxonomic Standardisation Workshop. Uljin, the Republic of Korea, 23-30 November 2014. ISA Technical Study: No. 13, International Seabed Authority Kingston.

ISA, 2016. Review of the implementation of the environmental management plan for the Clarion-Clipperton Fracture Zone. Twenty-second session, Kingston, Jamaica, 11-22 July 2016. Legal and technical Commission, ISBA/22/LTC/12.

ISA, 2017a. Environmental assessment and management for exploitation of minerals in the Area. Report of an international workshop convened by the Griffith University Law School in collaboration with the ISA, Queensland Australia 23-26 May 2016. ISA Technical Study: No 16.

ISA, 2017b. Towards an ISA environmental management strategy for the area. Report of an international workshop convened by the German Environment Agency (UBA), the German federal Institute for GeoSciences and Natural Resources (BGR) and the Secretariat of the International Seabed Authority (ISA) in Berlin, Germany, 20-24 March, 2017. ISA Technical Study: No 17.

ISBA/23/C/7, 5 June 2017 (ISA, 2017). Status of contracts for exploration and other matters. Twenty-third session Kingston, 7-18 August 2017. Report of the Secretary-General.

ISA, 2019. Draft Regulations on Exploitation of Mineral Resources in the Area (ISBA/25/C/WP.1).

ISA, 2020. Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area. ISBA/25/LTC/6/Rev.1 (Issued by the Legal and Technical Commission. Kingston, 4–15 March 2019. (Replaces ISBA/19/LTC/8).

Janssen A, Kaiser S, Meirner K, Brenke N, Menot L, Martinez Arbizu P (2015) A Reverse Taxonomic Approach to Assess Macrofaunal Distribution Patterns in Abyssal Pacific Polymetallic Nodule Fields. PLoS ONE 10(2): e0117790. doi:10.1371/journal.pone .0117790.

Jaun C, Van Rooij D, de Bruycker W 2018. An assessment of bottom current controlled sedimentation in Pacific Ocean abyssal environments. Marine Geology 403: 20-33.

Johnson K, Johnson B and Johnson H, 2020. Monterey Bay Aquarium Research Institute. Periodic Table of Elements in the Ocean. https://www.mbari.org/science/upper-ocean-systems/chemical-sensor-group/periodic-table-of-elements-in-the-ocean/ (accessed 15 Nov 2020).

Jones DOB, Kaiser S, Sweetman AK, Smith CR, Menot L, Vink A, et al. 2017. Biological responses to disturbance from simulated deep-sea polymetallic nodule mining. PLoS ONE 12(2): e0171750. https://doi.org/10.1371/journal.pone.0171750.

Jones, RT., “CONROAST – DC arc smelting of dead-roasted sulphide concentrates”, Sulphide Smelting 2002, TMS, p. 435-56.

Jung H-S, Lee C-B, Jeong K-S, Kang J-K, 1998. Geochemical and mineralogical characteristics in two- color core sediments from the Korea Deep Ocean Study (KODOS) area, northeast equatorial Pacific. Marine Geology 144: 295-309.

Kaiser S, Smith CR, Arbizu PM, 2017. Editorial: Biodiversity of the Clarion Clipperton Fracture Zone. Marine Biodiversity, 47: 259-264.

Kamenskaya, O. E., Melnik, V. F. & Gooday, A. J., 2013. Giant protists (xenophyophores and komokiaceans) from the Clarion-Clipperton ferromanganese nodule field (eastern Pacific). Biology Bulletin Reviews 3, 388–398.

Karl DM, Letelier RM, Tupas LM, Dore JE, Christian JR, Winn CD, 1995. Ecosystem changes in the North Pacific subtropical gyre attributed to the 1991-92 El Nino. Nature 373:230-234.

Kaufman, R and Latimer, J. P., 1971. “The design and operation of a prototype deep ocean mining ship”, Proceedings Society of Naval Architects and Marine Engineers, Spring Meetings, Honolulu, HI Vol. 3: 1-24.

Kaufman, R., Latimer, J. P., & Tolefson, D. C. (1985). The Design and Operation of a Pacific Ocean Deep-Ocean Mining Test Ship: R/V Deepsea Miner II OTC 4910. Offshore Technology Conference. Houston: SPE.

Kazmin Y 2009. Chapter 7 Geology of the Clarion Clipperton Zone: Existing geological information in respect of polymetallic nodules. In ISA 2009 (Establishment of a geological model of polymetallic nodule deposits in the Clarion-Clipperton Fracture Zone of the Equatorial North Pacific Ocean. Proceedings of the International Seabed Authority’s Workshop held 13-20 May, 2003 in Nadi, Fiji).

Kennecott Exploration Inc., 1976. “Results of Air Lift Nodule Impact Simulation”, Proprietary Report, TM-76-331.

Kennecott Exploration Inc., 1977. “The Air Lift Experiment”, Proprietary Report, TAC-S-143.

Kennecott Exploration Inc., 1978. “Development of a Deep Ocean Manganese Nodule Collector System”, Proprietary Report TAC-S-168.

Kennecott Exploration, Inc.,1978c. “Lift Pump Assessment and Comparison”, Proprietary Report TAC-S-157.

Kennecott Copper Corporation - Ledgemont Laboratory. (1977). Shipboard Nodule Material Handling (proprietary report). Lexington, Massachusetts: Kennecott Exploration Inc.

Kim HJ, Hyeong K, Yoo CM, Chi SB, Khim BK, Kim D 2010. Seasonal variations of particle fluxes in the north eastern equatorial Pacific during weak El Nino and normal periods. Geosci J 14:415-422.

Kingston Process Metallurgy, 2020. Techno-economic evaluation of converting existing RKEF NPI facilities in China/Indonesia from processing Ni laterite ore to processing sea nodules. As part of KPM Project P1609 for DeepGreen Resources. February 21, 2020.

Kotlinski, R. and Stoyanova, V., 2006 Buried and surface polymetallic nodule distribution in the eastern Clarion–Clipperton Zone: main distinctions and similarities. Advances in Geosciences Vol. 9: Solid Earth, Ocean Science & Atmospheric Science (2006) Eds. Yun-Tai Chen et al. World Scientific Publishing Company, pp 67-74.

Kuhn 2015. RV SONNE S0240 Cruise Report I Fahrtbericht. Bundesanstalt tor Geowissenschaften und Rohstoffe (BGR).

Kukert H, Smith CR. 1992. Disturbance, colonisation and succession in deep-sea ecosystems. Trends in ecology and evolution 2:359-363.

LeCourt, E. J and Williams, D. W. (1971) “Deep Ocean Mining – New Application for Oil Field and Marine Equipment”, Proceedings, Off-shore Technology Conference, Paper OTC 1412.

Lee, G.C, Kim, J., Chi, S.B., Ko, Y.T and Ham, D.J., 2008. Examination for correction factor for manganese nodule abundance using the free fall grab and box corer. The Sea: Journal of the Korean Society of Oceanography, Vol 13, No. 3 pp 280-285.

Leitner AB, Neuheimer AB, Donlon E, Smith CR, Drazen JC 2017. Environmental and bathymetric influences on abyssal bait-attending communities of the Clarion Clipperton Zone. Deep Sea Research Part I 125: 65-80.

Levin LA, Mengerink K, Gjerde KM, Rowden AA, Van Dover CL, Clark MR, Ramirez-Llodra E, Currie B, Smith CR, Sato KN, Gallo N, Sweetman AK, Lily H, Armstrong CW and Brider, J, 2016. Defining “serious harm” to the marine environment in the context of deep-seabed mining. Marine Policy, 74, 245-259.

Levin PS, Fogarty MJ, Murawski SA, Fluharty D 2009. Integrated Ecosystem Assessments: Developing the Scientific Basis for Ecosystem-Based Management of the Ocean. PLoS Biol 7(1): e1000014. https://doi.org/10.1371/journal.pbio.1000014.

Lewis, E. J. (1978), “Tapping the World’s Deepest, Wettest Mine”, Popular Mechanics, Nov. 1978.

Libralato S, Pranovi F, Stergiou K, Link J. 2014. Trophodynamics in marine ecology: 70 years after Lindeman. Mar. Ecol. Prog. Ser. 512, 1–7. (doi:10.3354/meps11033).

Lindh MV, Maillot BM, Shulse CN, Gooday AJ, Amon DJ, Smith CR, Church MJ 2017. From the Surface to the Deep-Sea: Bacterial Distributions across Polymetallic Nodule Fields in the Clarion-Clipperton Zone of the Pacific Ocean. Frontiers in microbiology https://doi.org/10.3389/fmicb.2017.01696.

Mackinen, T., et al, 1998. Physical chemistry of direct nickel matte smelting. Sulphide Smelting ’98, TMS, p. 59-68.

Manheim FT, 1978. Book review of G. P. Glasby, Marine manganese deposits. Geochemica et Cosmochimica Acta 42(5):541. Cited in: ISA. 2010. A geological model of polymetallic nodule deposits in the Clarion-Clipperton Fracture Zone and prospector’s guide for polymetallic nodule deposits in the Clarion-Clipperton Fracture Zone. International Seabed Authority Technical Study.

Marshall NB, 1979. Developments in Deep-Sea Biology. Blandford, Developments in Deep-Sea Biology. Poole. Dorset: Blandford Press 1979. ISBN 0-7137-0797-6. https://doi.org/10.1002/iroh.19810660416.

Masanza, M.K., et al., 2014. Commissioning of a second cobalt recovery furnace at Nchanga smelter, 5th International Symposium on high-temperature metallurgical processes, TMS 2014, p. 217-27.

Mero J, 1965. The Mineral Resources of the sea. Volume 1 (Elsevier Oceanography Series).

Mewes K, Mogollón J, Picard A, Rühlemann C, Kuhn T, Nöthen K, Kasten S 2014. Impact of depositional and biogeochemical processes on small scale variations in nodule abundance in the Clarion-Clipperton Fracture Zone, Deep Sea Res., Part I, 91(0): 125–141, doi:10.1016/j.dsr.2014.06.00.

MHWirth, 2020. 30 years subsea diamond mining with MHWirth drilling equipment. 30 Years Subsea Diamond Mining with MHWirth Drilling Equipment. Downloaded 18 February 2021.

Milligan RJ, Morris KJ, Bett BJ, Durden JM, Jones DOB, Robert K, Ruhl HA, Bailey DM 2016. High-resolution study of the spatial distributions of abyssal fishes by autonomous underwater vehicle. Sci. Rep. 6, 1–12.

Millward, B, 2008. Practical challenges of manufacturing a 2.5-MW subsea motor. https://www.offshore-mag.com/articles/print/volume-68/issue-10/subsea/practical-challenges-of-manufacturing-a-25-mw-subsea-motor.html.

Molodtsova TN, Opresko DM 2017. Black corals (Anthozoa: Antipatharia) of the Clarion-Clipperton Fracture Zone. Marine Biodiversity, 47: 349. https://doi.org/10.1007/s12526-017-0659-6.

Morgan CL, Odunton NI, Jones AT 1999. Synthesis of environmental impacts of deep seabed mining. Marine georesources and geotechnology 17:307-356.

Morgan C. 2009. Geological model project implementation. Presentation from the ISA geological model workshop December 2009, Kingston, Jamaica.

Mullineaux LS 1987. Organisms living on manganese nodules and crusts: distribution and abundance at three North Pacific sites. Deep-Sea Research 34(2): 165-184.

Niner HJ, Ardron JA, Escobar EG, Gianni M, Jaeckel A, Jones DO, ... and Van Dover CL, 2018. Deep-sea mining with no net loss of biodiversity—an impossible aim. Frontiers in Marine Science, 5, 53. https://doi.org/10.3389/fmars.2018.00053

NORI 2020a. NORI AREA D Environmental & Social Impact Assessment, Scoping, Terms of Reference and Plan of Work

NORI 2020b. Nauru Ocean Resources Inc. Annual Report for year ended 31 December 2019

Novikov G.V. and Bogdanova O. Y., 2007, Transformations of Ore Minerals in Genetically Different Oceanic Ferromanganese Rocks, ISSN 0024-4902, Lithology and Mineral Resources, 2007, Vol. 42, No. 4, pp. 303–317.

Paulikas D, Katona S, Ilves E, and Ali SH, 2020. Life cycle climate change impacts of producing battery metals from land ores versus deep-sea polymetallic nodules. Journal of Cleaner Production, https://doi.org/10.1016/j.jclepro.2020.123822.

Pape E, Bezerra TN, Hauquier F, Vanreusel A 2017. Limited Spatial and Temporal Variability in Meiofauna and Nematode Communities at Distant but Environmentally Similar Sites in an Area of Interest for Deep-Sea Mining. https://doi.org/10.3389/fmars.2017.00205.

Pinkerton MH, Bradford-Grieve JM, Hanchet SM 2010. A balanced model of the food web of the Ross Sea Antarctica. CCAMLR Science, 17: 1-31.

Pinkerton MH, Bradford-Grieve JM 2014. Characterising food web structure to identify potential ecosystem effects of fishing in the Ross Sea, Antarctica. CES Journal of Marine Science, Volume 71, Issue 7, September/October 2014, Pages 1542–1553, https://doi.org/10.1093/icesjms/fst230

Pinkerton MH 2013. Ecosystem Modelling of the Chatham Rise. Research report prepared for Chatham Rock Phosphate, April 2013. NIWA Client Report No: WLG2013-17. Pp 183.

Polunin NVC, Morales-Nin B, Pawsey WE, Cartes JE, Pinnegar JK and Moranta J, 2001. Feeding relationships in Mediterranean bathyal assemblages elucidated by carbon and nitrogen stable isotope data. Marine Ecology Progress Series, 220: 13-23.

Priede IG, Godbold JA, King NJ, Collins MA 2010. Deep-sea demersal fish species richness in the Porcupine Seabight, NE Atlantic Ocean: Global and regional patterns. Marine Ecology 31: 247-260.

Purser A, Marcon Y, Hoving H-jT, Vecchione M, Piatkowski U, Eason D, Bluhm H, Boetius A 2016. Association of deep-sea incirrate octopods with manganese crusts and nodule fields in the Pacific Ocean. Current Biology 26: R1247-R1271, December 19, 2016.

Rajcevic, H., et al., 1982. Development of electric furnace slag cleaning at a secondary copper smelter, J. Metals, March 1982, p. 54-56.

Rizea, S. (2018b), “Air Lift Simulation Model Developments – Validation Against Published Results”, Technical Note DRT-IRAD-SR-TN-01, 20 December.

Saito, T., Usami, T., Yamazaki, Y. (1989), “Lifting Characteristics of Manganese Nodules by Air-Lift-Pump on 200 m Vertical Test Plant”, Marine Technology Society, Proceedings, Oceans ’89 Conference.

Schultheiss, P. J. (1985). Physical and Geotechnical Properties of Sediments from Northwest Pacific: DSDP Leg 86, in Initial Reports of DSDP. Washington DC: U.S. Government Printing Office.

Sharma, R, Khadge, NH, and Jai Sankar S, 2013. Assessing the distribution and abundance of seabed minerals from seafloor. Int. J. Remote Sens., vol.34; 2013; 1691-1706.

SMM, 2020. Market intelligence study for Deep Green. October 2020.

Shaw, JL. (1993) “Nodule Mining –Three Miles Deep!”, Marine Georesources and Geotechnology, Vol. 11, pp. 181-197.

Shulse CN, Maillot B, Smith CR, Church MJ (2016) Polymetallic nodules, sediments, and deep waters in the equatorial North Pacific exhibit highly diverse and distinct bacterial, archaeal, and microeukaryotic communities. MicrobiologyOpen 1-16. https://doi.org/10.1002/mbo3.428.

Simon-Lledo E, Bett BJ, Huvenne VAI, Schoening T, Benoist NMA, Jeffreys RM, Durden JM, Jones DOB 2019. Megafaunal variation in the abyssal landscape of the Clarion Clipperton zone. Progress in Oceanography 170: 119-133.

Simpson S and Batley G, 2016. Sediment quality assessment: a practical guide. 2nd edition. Edited by S. Simpson and G Batley. CSIRO Publishing, Clayton South, Australia.

Smith CR. 1999. The biological environment in the nodule provinces of the seep sea. In: Deep-seabed polymetallic nodule exploration: development of environmental guidelines. Proceedings of the International Seabed Authority’s Workshop held in Sanya, Hainan Island, People’s Republic of China. 1–5 June 1998 (ISA/99/02). p. 41–68.

Smith CR, Galeron J, Glover A, Gooday A, Kitazato H, Lambshead J, Menot L, Paterson G, Rogers A, Sibuet M. 2008. Biodiversity, species ranges, and gene flow in the abyssal Pacific nodule province: predicting and managing the impacts of deep seabed mining. ISA Technical Study No. 3, International Seabed Authority, Kingston, Jamaica.

Smith CR, Tunnicliffe B, Colaço A, Sweetman AK, Washburn T and Amon D’ 2020. Deep-sea misconceptions cause underestimation of seabed-mining impacts. Science July 31, 2020. https://doi.org/10.1016/j.tree.2020.07.002.

Smith CR, Gaines S, Watling L, Friedlander A, Morgan C, Thurnhurr A, Mincks S, Rogers A, Clark M, et al, 2010. Areas of Particular Environmental Interest (or “Protected Areas”) for Ecosystem Based Management of the Clarion-Clipperton Zone: Rationale and Recommendations to the International Seabed Authority. 20 Expert participants in the workshop to Design Marine Protected Areas for Seamounts and the Abyssal Nodule Province in Pacific High Seas, Oct 23-26, 2007, University of Hawaii. https://www.isa.org.jm/files/documents/EN/Workshops/2010/Pres/SMITH.pdf.

Solar M, 2009. Mechanical slag losses in laterite smelting – nickel, COM 2009, Sudbury, p. 277-291.

Son J, Kim KH, Kim HJ, Ju S-J, Yoo CM 2014. Evaluation of Similarity of Water Column Properties and Sinking Particles between Impact and Preserved Sites for Environmental Impact Assessment in the Korea Contracted Area for Manganese Nodule Development, NE Pacific. Ocean and Polar Research 36(4): 423-435.

Sorokin YI. 1971. Quantitative evaluation of the role of bacteria-plankton in the biological productivity of tropical Pacific waters. In: Vinogradov ME, editor. Life activity of pelagic communities in the ocean tropics. pp 98-134.

Sorokin, Yu. I., T. S. Petipa, and Yeo V. Pavlova. 1970. Quantitative estimate of marine bacterioplankton as a source of food. Oceanology 10:253-260. (Cited in Turner 1984)

SPC 2013. Deep Sea Minerals: Manganese Nodules, a physical, biological, environmental, and technical review. Baker E, and Beaudoin Y. (Eds.) Vol. 1B, Secretariat of the Pacific Community.

Spickermann R, 2012. Rare earth content of manganese nodules in the Lockheed Martin Clarion-Clipperton Zone exploration areas. Proceedings Off-shore Technology Conference, Houston Texas.

Sridhar R, Jones WE, and Warner JS, 1976. Extraction of copper, nickel and cobalt from polymetallic nodules, JOM, April 1976, p 32.

Stoyanova V. 2012. Megafaunal diversity associated with Deep-Sea nodule bearing habitats in the eastern part of the Clarion Clipperton Zone, NE Pacific. 12th International Multidisciplinary Scientific GeoConference, www.sgem.org, SGEM2012 Conference Proceedings/ ISSN 1314-2704, June 17-23, 2012, Vol. 1, 645 - 652 pp.

Swaddling A 2016. Pacific ACP States, Regional environmental management framework for deep sea minerals exploration and exploitation. Suva, Fiji 2016 Prepared under the SPC-EU EDF 10 Deep Sea Minerals Project. SPC Noumea. http://dsm.gsd.spc.int/index.php/publications-and-reports.

Swaddling et al. 2016. Pacific-ACP states regional scientific research guidelines for deep sea minerals. Suva, Fiji 2016 Prepared under the SPC-EU EDF10 Deep Sea Minerals Project, by the Pacific Community (SPC) and the National Institute of Water and Atmospheric Research (NIWA) of New Zealand.

Tae-Kyeong Yeu; Suk-Min Yoon; Sup Hong; Hyung-Woo Kim; Chang-Ho Lee; Jin-Ho Kim; Cheon-Hong Min and Jong-Su Choi (2014) “Steering performance test of underwater mining robot” Proceedings Oceans 2014, IEEE, St. John’s, 14-19 Sept.

Tannuri, E. A., Morishita, H. M., Simos, A. N., Saad, A. C., Correa da Silva, S. H., Matos, V. L., & Sphaier, S. H. (2009). DP Assisted Offloading Operations in Brazilian Water. Dynamic Positioning Conference. Marine Technology Society.

Tetsuyoshi Kohga et al, 1995. Recovering Iron, Manganese, Copper, Cobalt, and High Purity Nickel from Polymetallic nodules, JOM, December 1995, p 40.

Thiel H, Schriever G, Bussau C, Borowski C 1993. Manganese nodule crevice fauna. Deep-Sea Research I 40(2):419-423.

Thiel H, Schriever G, Ahnert A, Bluhm H, Borowski C, Vopel K. 2001. The large-scale environmental impact experiment DISCOL - reflection and foresight. DeepSea Research 11(48):3869-3882.

Tilot V, 2006. Biodiversity and distribution of megafauna. Vol. 1: The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean; Vol. 2: Annotated photographic atlas of the echinoderms of the Clarion-Clipperton fracture zone. Paris, UNESCO/IOC, 2006 (IOC Technical Series, 69).

Tilot V, 2006a. Biodiversity and distribution of faunal assemblages. Vol. 3. Options for the management and conservation of the nodule ecosystem in the Clarion-Clipperton Fracture Zone: scientific, legal and institutional aspects. Paris, UNESCO/IOC, 2010 (IOC Technical Series, 69).

Tilot V, Ormond R, Moreno Navas J, Catalá TS 2018. The Benthic Megafaunal Assemblages of the CCZ (Eastern Pacific) and an Approach to their Management in the Face of Threatened Anthropogenic Impacts. Frontiers in Marine Science. 5:7. doi: 10.3389/fmars.2018.00007.

Tomic B, 2020. Turkey expands drill fleet. Offshore Engineer, 21 February 2020. https://www.oedigital.com/news/475897-turkey-expands-drillship-fleet.

Turner JT, 2002. Zooplankton fecal pellets, marine snow and sinking phytoplankton blooms. Aquatic microbial Ecology 27: 57-102.

Turner JT, 1984. The Feeding Ecology of Some Zooplankters That are Important Prey Items of Larval Fish. NOAA Technical Report NMFS 7. U.S. DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration National Marine Fisheries Service.

UNEP-WCMC (2016). Marine No Net Loss: A Feasibility Assessment of Implementing no Net Loss of Biodiversity in the Sea. Cambridge.

United Nations, 1970. Declaration 2749 (XXV). Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction.

UTEC 2015. Deepsea nodule collector vehicle mobility study and track sizing. UTEC Geomarine Report No. SG-DRT0002-1-0, prepared for Deep Reach Technology.

Vanreusel A, Hilario A, Ribeiro P, Menot L, and Martínez Arbizu P, 2016. Threatened by mining, polymetallic nodules are required to preserve abyssal epifauna. Sci Rep 6, 26808. https://doi.org/10.1038/srep26808.

Veillette J, Sarrazin J, Gooday AJ, Galeron J, Caprais JC, Vangriesheim A, Juniper SK, 2007a. Ferromanganese nodule fauna in the Tropical North Pacific Ocean: species richness, faunal cover and spatial distribution. Deep-Sea Research. Part I, Oceanographic Research Papers, 54: 1912–1935.

Veillette, J, Juniper SK, Gooday AJ, Sarrazin J 2007b. Influence of surface texture and microhabitat heterogeneity in structuring nodule faunal communities. Deep-Sea Research. Part I, Oceanographic Research Papers, 54: 1936–1943.

Volz JB, Mogollon JM, Geibert W, Arbizu PD, Koschinsky A, Kaasten S 2018: Natural spatial variability of depositional conditions, biogeochemical processes and element fluxes in sediments of the eastern Clarion-Clipperton Zone, Pacific Ocean. Deep Sea Research Part 1 140: 159-172.

Wasmund B, Voermann N, Haneman B, Sarvinis J, Sheehan G, 2011. Implementing New Technologies in Metallurgical Processes: Building Plants that Work. Canadian Institute of Mining Conference (CIM / COM), 2011.

Washburn TW, Turner PJ, Durden JM, Jones DO, Weaver, P and Van Dover CL. 2019. Ecological risk assessment for deep-sea mining. Ocean & Coastal Management, 176, 24-39.

World Ocean Atlas 2018. (WOA18). https://www.nodc.noaa.gov/OC5/woa18/

Yu OH, Lee H-G, Kim D, Wi JH, Kim KH, Yoo CM 2018. Characterisation of deep-sea macrofauna in the Korean exploration claim area in the Clarion Clipperton Fracture Zone, Northeastern Pacific Ocean. Ocean Science Journal 53(2):301-314.

25 Reliance on information provided by the registrant

AMC has relied upon information provided by the registrant in preparing its findings and conclusions regarding the following aspects of modifying factors:

I. Macroeconomic trends, data, and assumptions, and market studies as, for example, presented in Section 16;

II. Marketing information and plans within the control of the registrant as, for example, presented in Section 16, 18.1, 18.2, 18.5;

III. Legal matters outside the expertise of the qualified person, such as statutory and regulatory interpretations affecting the Project as, for example, described in Section 3, 13, and 20;

IV. Environmental matters outside the expertise of the qualified person as, for example, described in Section 17;

V. Accommodations the registrant commits or plans to provide to local individuals or groups in connection with its mine plans as, for example, described in Section 20; and

VI. Governmental factors outside the expertise of the qualified person as, for example, described in Section 3, 19.1.2.

Date

The effective date of this Technical Report Summary is 31 December 2020.

Signature

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Technical Report Summary

TOML Mineral Resource, Clarion Clipperton Zone, Pacific Ocean

DeepGreen Metals Inc.

In accordance with the requirements of SEC Regulation S-K (subpart 1300)

AMC Project 321012
26 March 2021

Unearth a smarter way

1 Executive summary

A large deposit of polymetallic nodules is located in the Clarion Clipperton Zone (CCZ) of the northern central Pacific Ocean. Despite the nodules being located at great depths (4000 to 6000 m), they were explored with considerable success between the mid-1960s to the present day using a variety of increasingly sophisticated deep-sea technologies. In early 2012, Tonga Offshore Mining Limited (TOML), then a 100% owned subsidiary of Nautilus Minerals Inc., acquired an Exploration Area of 74 713 km^2 of the CCZ. In line with the requirements of the relevant oversight body (International Seabed Authority or ISA) TOML is sponsored by the government of the Kingdom of Tonga. The contract for exploration of polymetallic nodules was approved in July 2011, and then formalised on 11 January 2012. The Exploration area consists of six separate areas (termed Areas A to F) scattered across the CCZ (Figure 1.1).

TOML commissioned AMC Consultants Pty Ltd (AMC) to prepare a Technical Report in accordance with the Canadian National Instrument 43-101 reporting standards (NI43-101) and Form 43-101F1. The Report presented the results of exploration and related studies carried out between 2013 and 2016 and an updated Mineral Resource estimate (AMC, 2016). The Mineral Resource statement was prepared in accordance with the SEC Regulation S-K (subpart 1300).

In 2020, DeepGreen Minerals Inc (DeepGreen) acquired the polymetallic nodule exploration contract awarded by the ISA to TOML. DeepGreen commissioned AMC Consultants Pty Ltd (AMC) to recompile the NI43-101 Technical Report (AMC, 2016) as a Technical Report Summary in accordance with SEC Regulation S-K (subpart 1300). AMC understands that DeepGreen may file this Technical Report Summary with the Securities Exchange Commission as part of an S-4 filing to support the merger between Sustainable Opportunities Acquisition Corporation and DeepGreen Metals Inc.

Exploration and development efforts in the CCZ started in the 1960s by state sponsored groups from Russia, France, Japan, Eastern Europe, China, Korea and Germany. Several commercial consortia also explored between the 1960s and the 1980s and in some instances their descendants are still involved to the present day. No commercial mining operations have yet been established in the CCZ. However, a variety of collectors, pick-up systems, and metallurgical processing flow sheets were tested, and several integrated “demonstration scale” systems operated in the CCZ for several months in the late 1970s. Processing test-work has encompassed a variety of hydrometallurgical and pyrometallurgical flow sheets, usually with good results.

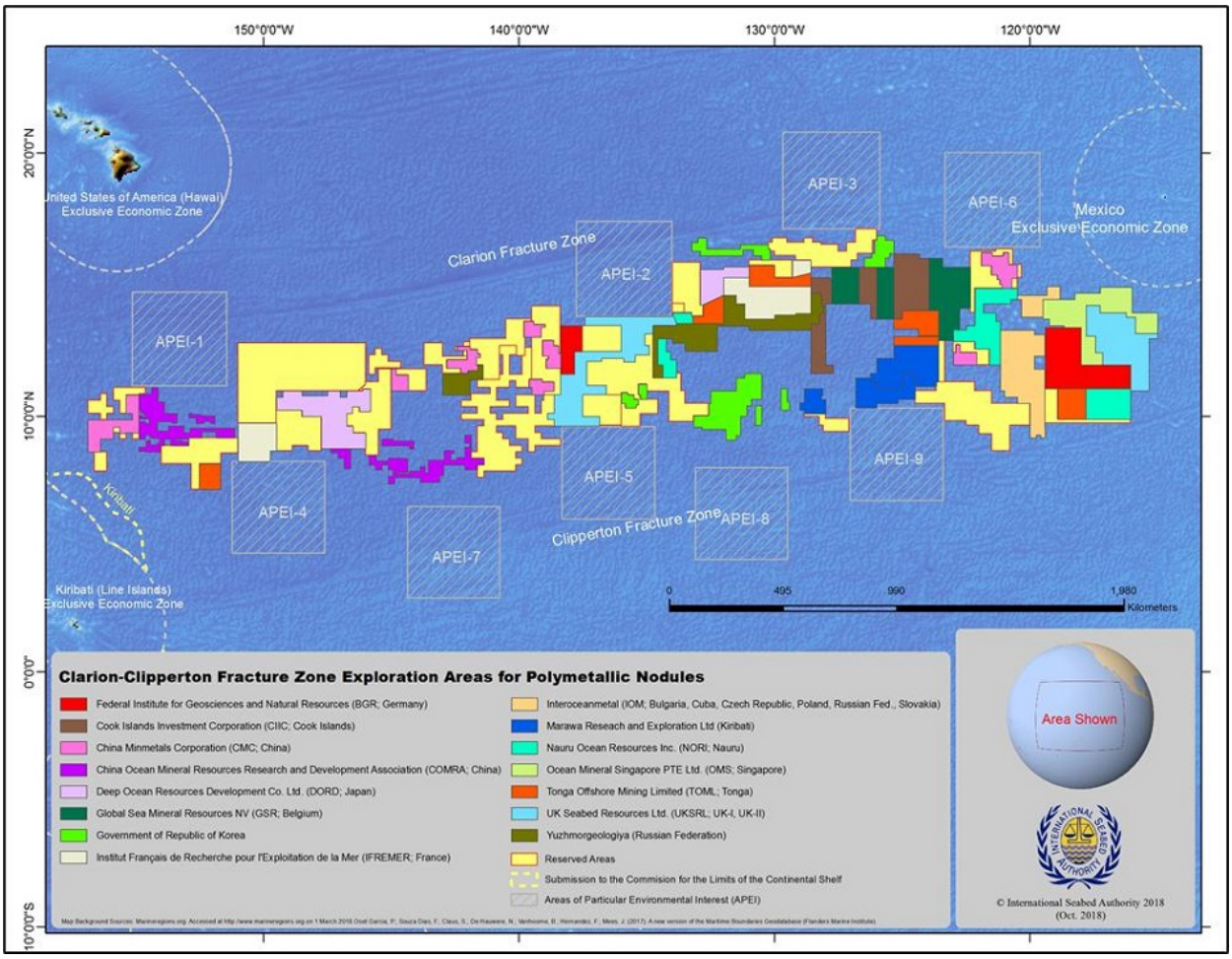
The climate is largely warm, and equatorial surface currents vary by season but are not generally very strong. Wave heights and frequencies are relatively moderate (for the open ocean). Storms are significant for part of the year as a major tropical cyclone belt covers the southern side of the CCZ, approximately one cyclone traverses any given area each year. The deposit is distal from major sea routes used by commercial transport vessels and is marginal to tuna fisheries. No communication cables cross the region.

The worldwide occurrence of polymetallic nodules has been known since the late 1800s. They form by the precipitation of metals either directly from ocean waters or via decomposing microorganisms and/or their waste matter in the benthic sediments. The specific conditions of the CCZ (water depth, latitude and seafloor sediment type) are believed to be the key controls on the formation of the CCZ nodule deposit, which is believed to be the largest and highest Ni-Cu-Co grade deposit of this type in the world. Nodules are typically 4 to 6 cm and up to 10 cm in diameter.

Unlike most land deposits, seafloor nodule deposits are characterized in terms of abundance, measured in units of wet kg/m^2. This is because both the primary exploration method (surface sampling) and likely recovery method (surface collectors or rakes) are unlikely to work at any significant depth below the seafloor (i.e., 0 to 30 cm). Abundances are typically reported as wet weights due to the practicalities of handling the nodule samples, the wet density of studied nodules is around 2 t/m^3 irrespective of the nodule size. Studies show nodules to contain around 29% free water and 16% water of crystallisation (incorporated into the complex manganese and iron oxy-hydroxide minerals of formation).

In 2012, Golder Associates Pty Ltd estimated an Inferred Mineral Resource for the entire TOML tenement Area. Part of this data was collected by previous explorers including pioneer contractors representing Japan, Russia and France. This data was obtained directly from the ISA and was not supplied with quality assurance or quality control data. However, verification was possible by cross comparison between all of the six pioneer contractors (also Korea, Germany and an eastern European consortium) who have so far supplied the ISA with data across what is effectively a single large deposit.

Figure 1.1 Location of the Clarion Clipperton Zone



Source: https://www.isa.org.jm/map/clarion-clipperton-fracture-zone, downloaded 18 February 2021

Data collected by TOML in 2013 and 2015 supports the historical data but also is of sufficient quantity and quality to allow estimation of an Indicated Mineral Resource for five sub areas within TOML Areas B, C, D and F called B1, C1, D1, D2 and F1. More detailed data collected by TOML has also allowed estimation of a Measured Mineral Resource for a single sub area within TOML Area B. Chain of custody, sample security, Quality Assurance and Quality Control were documented in detail for the TOML data.

The key data sets behind the Inferred Mineral Resource estimate for TOML Areas A through E are surface samples obtained by free fall grab samplers, although a few results from box-corers were also included. Free fall grab samplers are the standard sampling method as they are the most productive tool available. They are believed to underestimate the actual abundance, as smaller nodules may escape some grabs during ascent and larger nodules around the edge of the sampler may be knocked or fall out during the sampling process. This may introduce some conservatism to the Inferred Mineral Resource estimates.

The key data behind the Inferred Mineral Resource estimate for TOML Area F and the Indicated and Measured Mineral Resources are box-corers and measured photographs. Box-corers take longer to collect than free fall grab samplers, but they are believed to have less bias. Photos cover a much greater area than either free fall grabs or box-cores. The weight of individual nodules can be accurately estimated from the length of their long or major axis; a relationship first discovered in the 1970s. Using the box-core samples as calibration devices, TOML was able to measure the size of nodules on several hundred photographs in Areas B and C. Abundance is shown to be related both to nodule coverage in photos and to acoustic response (backscatter) from regional survey. These data thus provide very detailed indications of nodule abundance and continuity.

Many of the records of the sampling procedures used by the pioneer contractors were not available to the Qualified Persons, but it is likely that all of the pioneer contractors followed similar procedures to that used by TOML. Nodule abundance (wet kg/m^2) was derived by dividing the weight of recovered nodules by the surface area covered by the open jaws of the sampler or corer (typically 0.25 to 0.75 m^2). A split of the nodules was dried, crushed and ground to enable grade determination via standard analytical methods (typically atomic absorption spectrometry, X-ray fluorescence or inductively coupled plasma methods), either on the vessel or back on shore. Specific nodule chemical standards were used for instrument calibration. TOML also present the results of field, submitted and laboratory duplicates of nodule samples.

Analysis of the data reveals that, as a consequence of their origin, nodule grades vary only slightly across the CCZ, with spatial continuity of the abundance, Mn, Ni, Co, and Cu grades often ranging from the order of several kilometres up to several tens of kilometres. Nodule abundance is sometimes less continuous than grade, as it is also subject to local changes in net sedimentation (a consequence of seafloor slope, slumping, erosion and local currents).

The TOML Exploration Area has been split into two domains: areas with polymetallic nodules; and areas predominately without polymetallic nodules. The multibeam bathymetry and the backscatter data was used to interpret the parts of TOML Area B to F with no polymetallic nodules.

Estimation of tonnage and grade for the TOML Exploration Area within the CCZ was undertaken using only sample data within the TOML Exploration Area. Six block models were constructed using the programs Gstat 1.1-3 and R 3.2.5, one for each TOML Exploration Area (A to F), in three passes. The first pass used a parent block dimension of 1.75 km by 1.75 km and filled the areas defined as Measured Mineral Resource. The second pass for Indicated Mineral Resource used a parent block size of 3.5 km by 3.5 km while the third pass for Inferred used a parent block size of 7.0 km by 7.0 km.

The modelling methodology used for estimating the Mineral Resource was determined through careful consideration of the scale of deposit, mechanism of nodule formation, geological controls and nature of the sampling method. The approach involved estimating nodule abundance and grades into a two-dimensional block model with abundance used for calculating tonnage. Abundance and grades were estimated using Ordinary Kriging (OK) with comparison (not reported) estimates using Inverse Distance Weighting (IDW) and nearest neighbour (NN). The modelling methodology is similar to the method applied by the ISA (2010) for its global estimate which was produced by a multi-disciplinary effort that involved recognised subject matter experts.

The Mineral Resource estimate, with an effective date of 31 December 2020, is presented in Table 1.1. The Mineral Resource estimate at an abundance cut-off of 4 wet kg/m^2 is the selected base case scenario considering a non-selective bulk mining operation.

Table 1.1 Mineral Resource estimate, in situ, for the TOML exploration area within the CCZ at a 4 kg/m^2 nodule abundance cut-off

TOML Area	Classification	Tonnes (x10^6 wet t)	Abundance (wet kg/m^2)	Ni (%)	Cu (%)	Co (%)	Mn (%)
A	Inferred	114	11.0	1.1	1.0	0.2	25.0
B	Measured	3	11.8	1.3	1.0	0.2	27.6
B	Indicated	14	11.1	1.3	1.1	0.2	28.6
B	Inferred	63	9.1	1.2	1.0	0.3	25.9
C	Indicated	15	8.6	1.3	1.2	0.2	30.5
C	Inferred	115	9.0	1.3	1.1	0.2	28.2
D	Indicated	29	12.2	1.3	1.2	0.2	30.1
D	Inferred	102	9.0	1.3	1.2	0.2	28.8
E	Inferred	58	10.6	1.3	1.1	0.2	28.7
F	Indicated	12	21.6	1.5	1.2	0.1	32.5
F	Inferred	244	16.6	1.4	1.2	0.1	32.2
Total	**Measured**	**2.6**	**11.8**	**1.3**	**1.0**	**0.2**	**27.6**
Total	**Indicated**	**69.6**	**11.8**	**1.3**	**1.2**	**0.2**	**30.3**
Total	**Inferred**	**696**	**11.3**	**1.3**	**1.1**	**0.2**	**29.0**

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 28% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

The TOML Mineral Resource estimates are supported by an Initial Assessment carried out on behalf of DeepGreen for the neighbouring NORI Property (AMC, 2021). The polymetallic nodule deposits in NORI Area D are very similar to those in TOML Areas A to F and the QPs consider that the proposed development of NORI Area D is a reasonable analogue for future development in the TOML Areas. The NORI Property IA is directly relevant and applicable to the TOML Property for the reasons set out below:

- This polymetallic nodule mineral field within the CCZ is essentially a single mineral deposit almost 5,000 km in length and up to 600 km wide. The size and level of uniformity of mineralization is unmatched by any mineral deposit of similar value on land.
- The mechanism of formation of the nodules is interpreted to be essentially identical across the entire CCZ, with only minor local variations. Consequently, there is relatively little difference between the size, shape or metal content of the nodules from one area to another.
- The morphological features of the seafloor are similar in the TOML and the NORI Areas
- All Areas are administered under a common legal framework.
- There are no physical or logistical barriers between the Areas. Their location may simply influence shipping costs.

The commonality between the polymetallic nodule deposits in NORI Area D and the TOML Areas indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. The Technical Report Summary for NORI Area D assessed the following mining development scenario:

The IA proposes that nodules will be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection. The collectors will be remotely controlled and supplied with electric power via umbilical cables from production support vessel (PSV). Suction dredge heads on each collector will recover a dilute slurry of nodules, sediment, and water from the seafloor. A hopper on each vehicle will separate sediment and excess water, which will pass out of the hopper overflow, from the nodules, which will be pumped as a higher concentration slurry via flexible hoses to a riser. The riser is a steel pipe through which nodules will be transferred to the surface by means of an airlift.

The PSV will support a riser and lift system (RALS) and its handling equipment, and will house the airlift compressors, collector vehicle control stations, and material handling equipment. All power for off-shore equipment, including the nodule collecting vehicles, will be generated on the PSV. The PSVs will be equipped with controllable thrusters and will be capable of dynamic positioning (DP), which will allow the vessels and risers to track the collectors. Nodules will be discharged from the RALS to the PSVs, where they will be dewatered and temporarily stored or transferred directly to a transport vessel."

A combined pyrometallurgical and hydrometallurgical mineral processing scenario is envisaged. The first part of the pyrometallurgical process is the Rotary Kiln Electric Furnace (RKEF) process that is widely used in the nickel laterite industry. The second pyrometallurgical step (sulphidisation of the alloy produced in the first step to form a matte and then partially conversion in a Peirce-Smith converter to remove iron), while not widely practiced, also has commercial precedent at the Doniambo plant of Societe Le Nickel in New Caledonia.

Sulphuric acid leaching of matte from the pyrometallurgical process has precedent in the platinum group minerals (PGM) industry. Although copper producers typically have a solvent extraction step before electrowinning of their copper, direct copper electrowinning is done in most PGM refineries, where nickel and cobalt are also significant pay-metals. This is to maximise nickel recovery and minimise operating expenses. The nickel and cobalt are purified using solvent extraction, ion exchange and precipitation, which are all commercially proven hydrometallurgical processes. Battery grade nickel and cobalt sulphate are then crystallised from the purified solutions.

The pyrometallurgical process forms two by-products as well as the matte for the hydrometallurgical refinery:

- Electric furnace slag containing silica and 53% MnO that is intended to be sold as feed to the Si-Mn industry.
- A converter aisle slag that could be used for aggregate in road construction or other applications.

The hydrometallurgical refinery generates iron residues that would, for a stand-alone plant, require disposal. However, these streams can be recycled back to the pyrometallurgical plant for re-treatment and recovery of entrained pay metals.

Selection of ammonia as a principal reagent in the hydrometallurgical refinery means that an additional by-product—ammonium sulphate—is generated. This could be sold into the fertiliser industry.

The copper cathode quality from direct electrowinning, without a solvent extraction step, is expected to be ≥99.9% Cu. Quality of the matte produced in the pyrometallurgical plant will have an impact on this, including the potential carryover of impurities beyond values assumed for the purpose of the IA.

The production of battery-grade nickel and cobalt sulphates is targeted instead of nickel or cobalt cathodes or other intermediate products.

In summary:

- All parts of the proposed process have commercial precedents in similar or analogous industries, however not as a whole continuous flowsheet.
- Pay-metals are recovered in the following forms:

  - Copper cathodes with an expected quality of ≥99.9% Cu.
  - Battery-grade nickel sulphate.
  - Battery-grade cobalt sulphate.
- Rather than generating large waste streams, the process produces by-products including high manganese content furnace slag and ammonium sulphate.

The process assumptions used in this study will need to be verified as the project proceeds.

The QP considers that this IA supports the view that there are reasonable prospects of economic extraction of polymetallic nodule Mineral Resources in the TOML Areas.

The infrastructure requirements for the development of commercial production in the TOML Areas, apart from the minerals processing facility, will be modest compared to terrestrial resources projects of similar production capacities.

The site and host country for the minerals processing facility has not yet been confirmed. The site must be serviced by grid power, reticulated water, and natural gas. A location will be selected that is close to an industrial port, and near an existing municipality from which labour can be sourced.

A preliminary assessment of the transportation fleet for transfer of nodules from the CCZ to an existing deep-water industrial port equipped with bulk offloading facilities was examined (AMC, 2021). The IA assumed that chartered vessels would be used to transport the dewatered nodules to the port of Lazaro Cardenas, Michoacan, Mexico, 960 nm from the NORI Area D reference site. The vessels would be converted bulk mineral carriers with dynamic positioning (DP) to allow tracking behind the production support vessels during operations. The method of offloading, known as tandem offloading, is well established for offloading of oil production vessels in remote areas of the world.

AMC has considered the market for the nickel, copper, cobalt and manganese products that might be recovered from the polymetallic nodules in the TOML Areas.

CRU International Limited (CRU) was commissioned by NORI to provide market overviews for the four main products from the NORI Area D Project: nickel sulphate ($NiSO_4$), cobalt sulphate ($CoSO_4$), copper, and a manganese product (CRU, 2020). CRU expects growth in these markets.

CRU expects copper and $NiSO_4$ prices to rise in real terms by 2035, while manganese ore and $CoSO_4$ prices are forecast to remain flat, due to current prices being at or near a high point in the cycle, recent fall in prices, and expected modest growth in the global steel industry after the COVID 19 epidemic. The long-term cost of production is expected to rise for both copper and $NiSO_4$, helping to support prices.

The QPs consider that the proposed development of NORI Area D is a reasonable analogue for future development in the TOML Areas and the IA completed for the NORI Property is directly relevant and applicable to the TOML Property. The QPs consider that this IA supports the view that there are reasonable prospects of economic extraction of polymetallic nodule Mineral Resources in the TOML Areas.

Recommended future work on the TOML Exploration Area will focus on:

- Further exploration to raise the Inferred Mineral Resources to Indicated and Measured status. The proximity of TOML Area F to NORI Area D suggests that TOML Area F should be a priority.
- Detailed studies to develop key modifying factors to a point where a Mineral Reserve may potentially be estimated;
- Environmental baseline work to support an EIS;

- Concept study work on engineering and commercial aspects leading to trial mining;
- Trial mining.

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List of Acronyms and Terms

AAS	Atomic Absorption Spectroscopy
AP	Abyssal Plain
AH	Abyssal Hills
APEI	Areas of Particular Environmental Interest
Abundance	Abundance of polymetallic nodules expressed in kg/m^2
AFERNOD	Association Française pour l'Étude et la Recherche des Nodules
ALS	ALS Group or ALS Laboratories
AMC	AMC Consultants
AMR	Arbeitsgemeinschaft Meerestechnisch Gewinnbare Rohstoffe
ANOSIM	Analysis of Similarity
ASMOD	Adaptive Spline Modelling of Observation Data
AUV	Autonomous Underwater Vehicle
BC	Box Corer
BIE	Benthic Impact Experiment
BGR	German Consortium
BL	Bottom left
BR	Bottom right
BRT	Boosted Regression Trees
C	Centre
CAPEX	Capital Expenditure
CATAMI	Collaborative & Annotation Tools for Analysis of Marine Imagery & Video
CCD	Calcite Compensation Depth
CCZ	Clarion Clipperton Zone
CEA	Commissariat à l'Energie Atomique
CIIC	Cook Islands Investment Corporation
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CGL	Reference material CGL131 (nodule geochemical standard)
CLB	Continuous Line Bucket Group
CMECS	Coastal and Marine Ecological Classification Standard
COC	Chain of custody
COMRA	China Ocean Mineral Resources Research and Development Association (Chinese Consortium)
COR	Committee of Representatives
CSMF	conservation significant marine fauna
CV	Coefficient of variation
DAS	Acid pressure digestion system
DEME	Dredging, Environmental & Marine Engineering or DEME Group
DNA	Deoxyribonucleic acid
DOMA	Deep Ocean Minerals Association
DOMCO	Deep Ocean Mining Co.
DOMES	Deep Ocean Mining Environmental Study
DORD	Deep Ocean Resources Development Company (Japanese Consortium)
DSSRS	Deep Sea Sediment Re-suspension System
EC	European Commission
eDNA	Environmental DNA
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ENSO	El Niño–Southern Oscillation
EPR	East Pacific Rise
EUNIS	European Nature Information System
FFG	Free fall Grab samplers
FGDC	US Federal Geographic Data Committee
FIGNR	Federal Institute for Geosciences and Natural Resources (German Consortium)
FPSO	Floating Production Storage and Offloading

GEBCO	General Bathymetric Chart of the Oceans (www.gebco.net)
GEMONOD	Groupement pour la mise au point des MOyens nécéssaires à l'exploitation des NODules
GH	Graben horst
GPO	Government Printing Office
GSR	Global Sea Mineral Resources
Gstat	program for modelling geo-statistical data in one, two or three dimensions
G-TEC	G-TEC Sea Mineral Resources
GU	Gently undulating
HEBBLE	High-Energy Benthic Boundary Layer Experiment
HPAL	High temperature and high pressure sulfuric acid leach process
ICP-AES	Inductively couple plasma atomic emission spectrometry
ICP-MS	Inductively couple plasma mass spectrometry
ICP-OES	Inductively couple plasma optical emission spectrometry
IDOE	International Decade of Ocean Exploration
IDW	Inverse Distance Weighting estimation method
Ifremer	Institut Français de Recherché pour l'Exploitation de la Mer
IHC	Royal IHC or IHC Merwede
INCO	International Nickel Corporation
IOM	Interoceanmetal Joint Organization (Bulgaria, Cuba, Czech Republic, Poland, Russian Federation and Slovakia Consortium)
ISA	International Seabed Authority
ITLOS	International Tribunal for the Law of the Sea
JAG	US Navy Judge Advocates General's Corps
JET	Japan Deep Sea Impact Experiment
JORC	Joint Ore Reserves Committee
JPI Oceans	Joint Programming Initiative Healthy and Productive Seas and Oceans
KADOM	Korean Association of Deep-Ocean Mineral Development
KCON	Kennecott Consortium
KEI	Kennecott Exploration Inc
KIGAM	Korea Institute of Geology, Mining and Materials
KIOST	Korean Institute of Ocean Science and Technology
KMPC	Korea Mining Promotion Corporation
KORDI	Korean Ocean Research and Development Institute (now known as KIOST; Korean Institute of Ocean Science and Technology)
KRISO	Korea Research Institute of Ships & Ocean Engineering
L	left
LAE	Long Axis Estimation
LMS	Lockheed Martin Systems
LOI	Loss on ignition
LTC	Legal and Technical Commission of the ISA
MAK	YMG MAK-1 sidescan sonar
MAPR	Miniature (mini) autonomous plume recorder
MBES	MultiBeam Echo Sounding
MFES	Multi-Frequency Exploration System
MIR	YMG Towed sonar & photo platform
MITI	Japanese Ministry of International Trade and Industry
NI 43-101	Canadian National Instrument 43-101
NIOT	National Institute of Ocean Technology
NOAA	National Oceanic and Atmospheric Administration
NOAA NWS	US National Oceanic and Atmospheric Administration, National Weather Service
NOD-P-1	NOD-P-1 is a geochemical reference standard
NORI	Nauru Ocean Resources Inc
NORIA	NOdules RIches et Abondants
NORMED	Chantiers du Nord et de la Méditerranée

NN	Nearest Neighbour estimation method
OK	Ordinary Kriging estimation method
OMA	Ocean Mining Associates
OMCO	Ocean Minerals Co. (US Consortium)
OMI	Ocean Mining Incorporated
OMS	Ocean Mineral Singapore Pte Ltd
OPEX	Operating Expenditure
ORP	Oxygen Reduction Potential
PMA	Priority mining areas
PREPCOM	Preparatory Commission
PTFE	polytetrafluoroethylene
QAQC	Quality Assurance and Quality Control
QP	Qualified Person
QQ	Quantile-quantile
%RSD	% relative standard deviation
R	Right
R-type	Rough type nodules
R-S-type	Rough-smooth type nodules
REE	Rare Earth Elements
ROV	Remotely Operated Vehicle
ROTV	Remotely Operated Towed Vehicle
RSR	Reciprocating States Regime
SA-SSS	Synthetic aperture side scan sonar
SIO	Scripps Institution of Oceanography
SIS	Sequential indicator simulation
SOEST	School of Ocean and Earth Science and Technology, University of Hawaii
SOSI	Sound Ocean Systems Inc
SSS	Sidescan sonar
S-type	Smooth type nodules
TL	Top left
TM	Total metals
TOML	Tonga Offshore Mining Limited
TPA (tpa)	Tonnes Per Annum
TR	Top right
TSS	Total suspended sediment
UGI	YMG underwater geotechnical instrument
UH	Undulating hills
UK	United Kingdom
UKSR	UK Seabed Resources
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea 1982
UNOETO	United Nations Oceans Economics and Technology Office
USBL	Ultra Short BaseLine
USGS	United States Geological Service
US/USA	United States/United States of America
USNEL	United States Naval Electronic Laboratory
USSR	Union of Soviet Socialist Republics
UTM	Universal Transverse Mercator Cartesian coordinate system
V/H	Vertical on horizontal (vertical exaggeration in a profile or section)
WA	US state of Washington
WGS	World Geodetic System
WOR	World Ocean Review 2010
XRF	X-ray fluorescence
YMG	State Enterprise Yuzhmorgeologiya (Russian Federation Consortium)

Elements

Al	Aluminium
As	Arsenic
Ba	Barium
Ca	Calcium
Ce	Cerium
Ce	Cerium
Cl	Chlorine
Co	Cobalt
Cu	Copper
Dy	Dysprosium
Er	Erbium
Eu	Europium
F	Fluorine
Fe	Iron
Gd	Gadolinium
Ho	Holmium
La	Lanthanum
La	Lanthanum
Lu	Lutetium
Mg	Magnesium
Mn	Manganese
Mo	Molybdenum
Nd	Niobium
Nd	Neodymium
Ni	Nickel
Pb	Lead
PGM	Platinum Group Minerals
Pm	Promethium
Pr	Praseodymium
Pt	Platinum
REE	Rare Earth Elements
S	Sulphur
Sc	Scandium
Si	Silicon
Sm	Samarium
Sr	Strontium
Tb	Terbium
Te	Tellurium
Ti	Titanium
Tm	Thulium
Y	Yttrium
Yb	Ytterbium
Zn	Zinc
Zr	Zirconium

Direction – Azimuth Abbreviations

N	North
E	East
S	South
W	West
NNE	North North East
NE	North East
ENE	East North East
ESE	East South East

SE	South East
SSE	South South East
SSW	South South West
SW	South West
WSW	West South West
WNW	West North West
NW	North West
NNW	North North West

Symbols and Units

°	Degree
°C	Degrees centigrade
(aq)	Aqueous
µm	Micrometre
cm	Centimetre
g/t	Grams per tonne
Gt	Giga (billion) tonnes
kg	Kilogram
kg/m^2	Kilograms per square kilometre (abundance)
km^2	Square kilometres
kn	Knot
kWh/t	Kilowatt hour per tonne
m	Metre
M	Mole
Mt	Million tonnes
Mwt	Million wet tonnes
m/s	Metres per second
m^3	Cubic metre
mbsl	Metres below sea level
mm	Millimetre
Mwt	Million tonnes (wet)
nm	Nautical mile
ppb	Parts per billion
ppm	Parts per million
s	Second(s) or soluble
t/m^3	Tonnes per cubic metre

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2 Introduction

A large deposit of polymetallic nodules is located in the Clarion Clipperton Zone (CCZ) of the northern central Pacific Ocean. Despite the nodules being located at great depths (4,000 to 6,000 m), they were explored with considerable success between the mid-1960s to the present day using a variety of increasingly sophisticated deep-sea technologies. In early 2012, Tonga Offshore Mining Limited (TOML), a 100% owned subsidiary of Nautilus Minerals Inc. acquired an Exploration Area of 74 713 km^2 of the CCZ. In line with the requirements of the relevant oversight body (International Seabed Authority or ISA) TOML is sponsored by the government of the Kingdom of Tonga. The contract for exploration of polymetallic nodules was approved in July 2011, and then formalised on 11 January 2012.

TOML commissioned AMC Consultants Pty Ltd (AMC) to prepare a Technical Report in accordance with the Canadian National Instrument 43-101 reporting standards (NI43-101) and Form 43-101F1. The Report presented the results of exploration and related studies carried out between 2013 and 2016 and an updated Mineral Resource estimate (AMC, 2016). The Mineral Resource statement was prepared in accordance with the CIM “Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines”.

In 2020, DeepGreen Metals Inc (DeepGreen) acquired the polymetallic nodule exploration contract awarded by the ISA to TOML. DeepGreen commissioned AMC Consultants Pty Ltd (AMC) to recompile the NI43-101 Technical Report (AMC, 2016) as a Technical Report Summary in accordance with SEC Regulation S-K (subpart 1300).

2.1 Purpose of the Technical Report Summary

AMC understands that DeepGreen may file this Technical Report Summary with Securities Exchange Commission as part of an S-4 filing to support the merger between Sustainable Opportunities Acquisition Corporation and DeepGreen Metals Inc.

2.2 Sources of information and data

This Technical Report Summary was recompiled from an NI43-101 Technical Report which documented exploration and estimation of Mineral Resources in the TOML Area (AMC, 2016). No new exploration data or modifications to the Mineral Resource estimate have been presented, except that the Mineral Resource has been quoted at a cut-off of 4 kg/m^2 abundance. The new cut-off is based on the estimates of costs and revenues presented in the Initial Assessment (IA) of the Mineral Resource contained in NORI Area D (AMC, 2021). The polymetallic nodule deposits in NORI Area D are similar to those in TOML Areas A through F and the QP considers that the proposed development of NORI Area D is a reasonable analogue for future development in the TOML Areas.

2.2.1 International Seabed Authority data

The historical sample data used as the basis for the Mineral Resource estimate in this report was obtained by Golder Associates directly from the ISA (Golder Associates, 2013). The data was also obtained separately by TOML.

Under the principles of the Law of the Sea, developed nation contractors explore then relinquish or return 50% of their initial Exploration Area to the ISA. As part of this process the ISA requires each pioneer contractor to provide all sample data to a robust centrally managed database within the ISA. The ISA then analyse these data to verify that the two areas are of equal economic value. The analysis and acceptance, or otherwise, of the data by the ISA indicates a degree of verification and validation of these data.

The ISA also supplied TOML with other data in numerous reports (referenced accordingly in the text) and the Mining Code administered by the ISA. These reports as well as structure and authorities of the ISA are publicly available from the ISA website (http://www.isa.org.jm).

The authors of this report neither supervised nor were involved with the preparation, compilation and management of data supplied by the ISA. The ISA compiled these data from multiple and independent Contractors and other sources. These data can be relied upon for the following reasons:

- The ISA has an imperative to manage these data properly and fairly in order to maintain credibility and minimize disputes amongst its many stakeholders (the nations of the world) and to date AMC is unaware of any such disputes being raised in the context of data quality and management;
- The ISA operates independently of any particular government or commercial stakeholder;
- These data have been used as part of a CCZ wide study and mineral inventory estimation exercise (ISA, 2010), which involved experts not employed by the ISA, or TOML, and these data were deemed to be of suitable reliability by the ISA for this exercise.

2.2.2 TOML exploration data

In addition to the above ISA data, TOML collected data including:

- 64,432 km^2 of multibeam sonar bathymetry and backscatter response and interpretation thereof collected during a campaign in 2013 on the RV Mt Mitchell;
- 13 nodule bulk samples and analysis thereof collected on the above 2013 campaign;
- 113 quantitative estimates of nodule abundance from box-core sampling collected during a campaign in 2015 on the RV Yuzhmorgeologiya;
- 161 quantitative estimates of nodule abundance from 587 line km or 20,857 frames of seabed photography collected on the above 2015 campaign, as well as logging of megafauna from the photos and 192 hours of continuous video;
- 4 nodule bulk samples and analysis thereof collected on the above 2015 campaign;
- 280 line km of sidescan and sub-bottom profile sonar survey and interpretation thereof collected on the above 2015 campaign;
- 334 profiles of water chemistry and sea column characterization data and analysis thereof collected on the above 2015 campaign;
- Biological taxonomy (in progress) of 3195 samples collected on the above 2015 campaign.

2.3 Field involvement

Mr John Parianos visited the CCZ from 4 September to 7 October 2013 on board the RV Mt Mitchell and from 4 August to 10 October 2015 on board the RV Yuzhmorgeologiya. He spent a total of approximately three months within the CCZ surveying and sampling the TOML Exploration Areas.

2.4 Personnel

The Sections that each of the Qualified Persons (QPs) were responsible for are summarised in Table 2.1. In addition, each of the QPs contributed to Sections 22–24, where relevant to the Sections for which they were primarily responsible.

AMC has relied upon information provided by the registrant in preparing its findings and conclusions regarding some aspects of modifying factors, as set out in Section 25.

Table 2.1 List of Qualified Persons responsible for each section

Qualified Person	Responsible for the following report Sections:
AMC Consultants Pty Ltd	Sections 1–3, 8, 9, 11.1 – 11.8, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.8, 11.9.9, 12, 16–25
Canadian Engineering Associates Ltd	Sections 10, 11.9.6, 14
Deep Reach Technology Inc	Section 11.9.5, 11.9.7, 13, 15
John Michael Parianos, MSc (Earth Sciences), MAIG	Sections 4, 5, 6, 7

2.5 Reliance on other experts

The QPs have relied upon other experts for some sections in this report. These are summarised in Table 2.2.

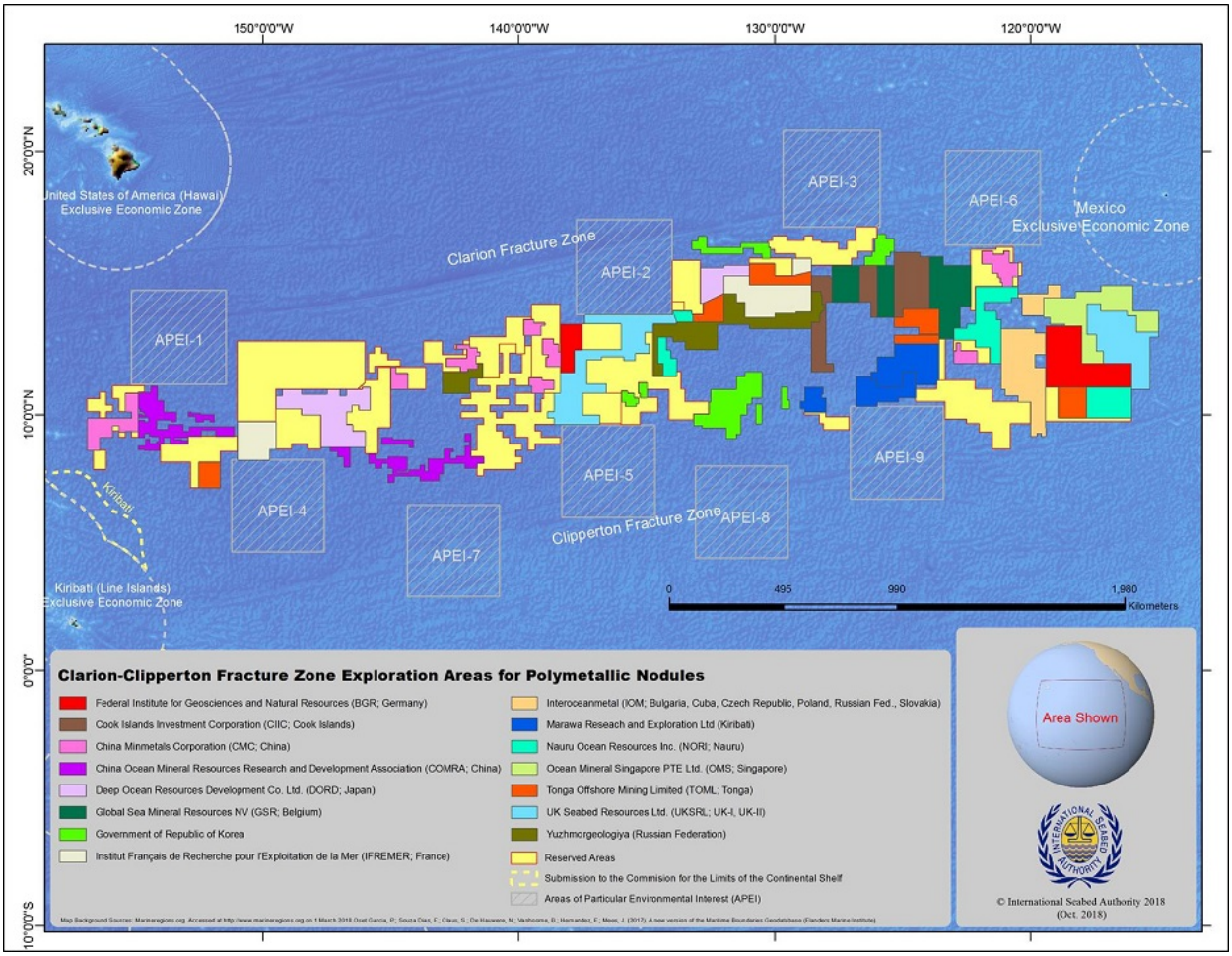
Table 2.2 Reliance on other experts

Expert	Report Sections:
Picton Group Pty Ltd	Section 17

3 Property Description and Location

The TOML exploration rights are located within the Clarion Clipperton Zone (CCZ) located in the Pacific Ocean Figure 3.1). The western end of the CCZ is approximately 500 km ENE of Kiribati and approximately 1,000 km south of the Hawaiian island group. The CCZ extends over 4,500 km ENE, in an approximate 750 km broad trend with the eastern limits located approximately 2,000 km west of southern Mexico.

Figure 3.1 Location and contractors in the Clarion Clipperton Zone



Source: https://www.isa.org.jm/map/clarion-clipperton-fracture-zone, downloaded 18 February 2021

3.1 Tenements and Permits

Tonga Offshore Mining Ltd (TOML), a 100% owned subsidiary of Nautilus Minerals Inc., was sponsored by the Government of the Kingdom of Tonga in its application for approval of a “plan of work for exploration for polymetallic nodules” by the International Seabed Authority (ISA) under the terms of the United Nations Convention on the Law of the Sea 1982 (UNCLOS) and the Mining Code of the ISA (specifically the Regulations for Prospecting and Exploration of Polymetallic Nodules).

The ISA approved the plan of work in July 2011 and this led to signing of a “contract for exploration for polymetallic nodules” by the ISA and TOML on 11 January 2012, that formalised an “Exploration Area” (tenement or licence; Figure 3.1, Table 3.1), a term of 15 years for the contract, and a programme of activities for the first 5-year period. The contract also formalised the rights of TOML around security of tenure leading to a “contract for exploitation”. The contract does not cover minerals other than polymetallic nodules but in this context the ISA is obligated to ensure that no other entity operates in a manner that might unreasonably interfere with TOML.

The TOML contract area comprises six separate blocks (A through F) in the CCZ with a combined area of 74,713 km^2 (Table 3.1 and Table 3.2). These areas were previously explored by Pioneer Investors.

Table 3.1 TOML exploration area in the CCZ

Exploration Area	Reserved Block	Area (km^2)
Area A	Block 2	10,281
Area B	Block 15	9,966
Area C	Block 16	15,763
Area D	Block 20	15,881
Area E	Block 21	7,002
Area F	Block 25	15,820
Total		**74,713**

Table 3.2 TOML area extents

Area	Minimum Latitude (DD)	Maximum Latitude (DD)	Minimum Longitude (DD)	Maximum Longitude (DD)	Minimum UTM X (m)	Maximum UTM X (m)	Minimum UTM Y (m)	Maximum UTM Y (m)	UTM Zone
A	7.167 N	8.167 N	151.667 W	152.510 W	553972	647187	792205	902968	05N
B	13.580 N	14.667 N	132.000 W	133.200 W	694518	824685	1502009	1623605	08P
C	15.000 N	15.800 N	128.583 W	131.000 W	284947	544791	1658371	1747847	09P
D	13.125 N	14.083 N	123.583 W	125.333 W	247293	437022	1451031	1557860	10P
E	12.750 N	13.083 N	123.583 W	125.333 W	246693	436796	1409563	1447513	10P
F	9.895 N	11.083 N	117.817 W	118.917 W	289835	410804	1093917	1225828	11P

DD – Decimal degrees, UTM - Universal Transverse Mercator map projection

To date, no exploitation licences for extracting minerals from the seafloor within the Area have been granted.

3.1.1 United Nations Convention on the Law of the Sea

The international seabed area (otherwise known as the Area) is defined as the seabed and subsoil beyond the limits of national jurisdiction (UNCLOS Article 1). Figure 3.2 shows a map of the Area (blue zone) as well as 200 nautical mile exclusive economic zones (grey zone) and extended continental shelf zones (orange zone). Figure 3.3 shows the relationships between depth, distance and jurisdiction.

The principal policy documents governing the Area include:

- The United Nations Convention on the Law of the Sea, of 10 December 1982 (The Convention).
- The 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (the 1994 implementation Agreement).

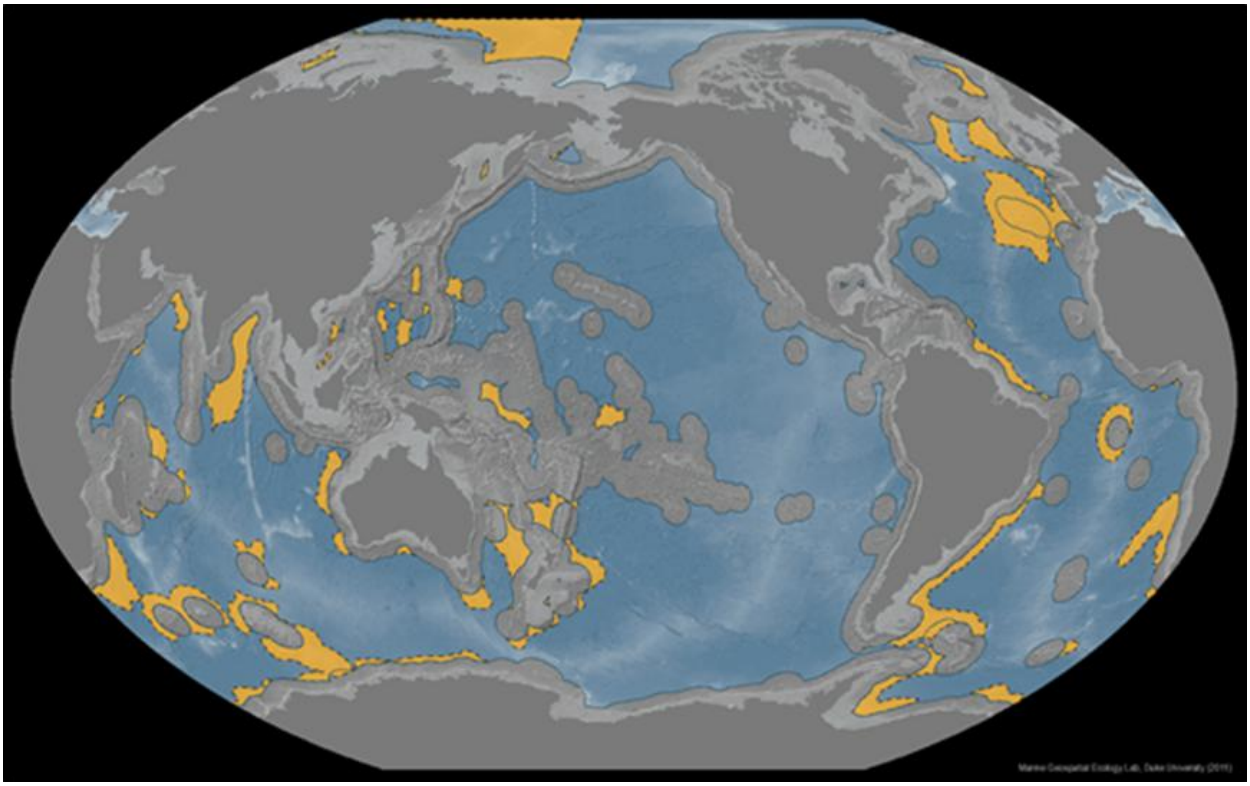
The Convention deals with, among other things, navigational rights, territorial sea limits, exclusive economic zone jurisdiction, the continental shelf, freedom of the high seas, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits, conservation and management of living marine resources in the high seas, protection of the marine environment, marine scientific research, and settlement of disputes.

Part XI of the Convention and the 1994 Implementation Agreement deals with mineral exploration and exploitation in the Area, providing a framework for entities to obtain legal title to areas of the seafloor from the ISA for the purpose of exploration and eventually exploitation of resources.

The Convention entered into force on 16 November 1994. A subsequent agreement relating to the implementation of Part XI of the Convention was adopted on 28 July 1994 and entered into force on 28 July 1996. The 1994 Implementation Agreement and Part XI of the Convention are to be interpreted and applied together as a single instrument.

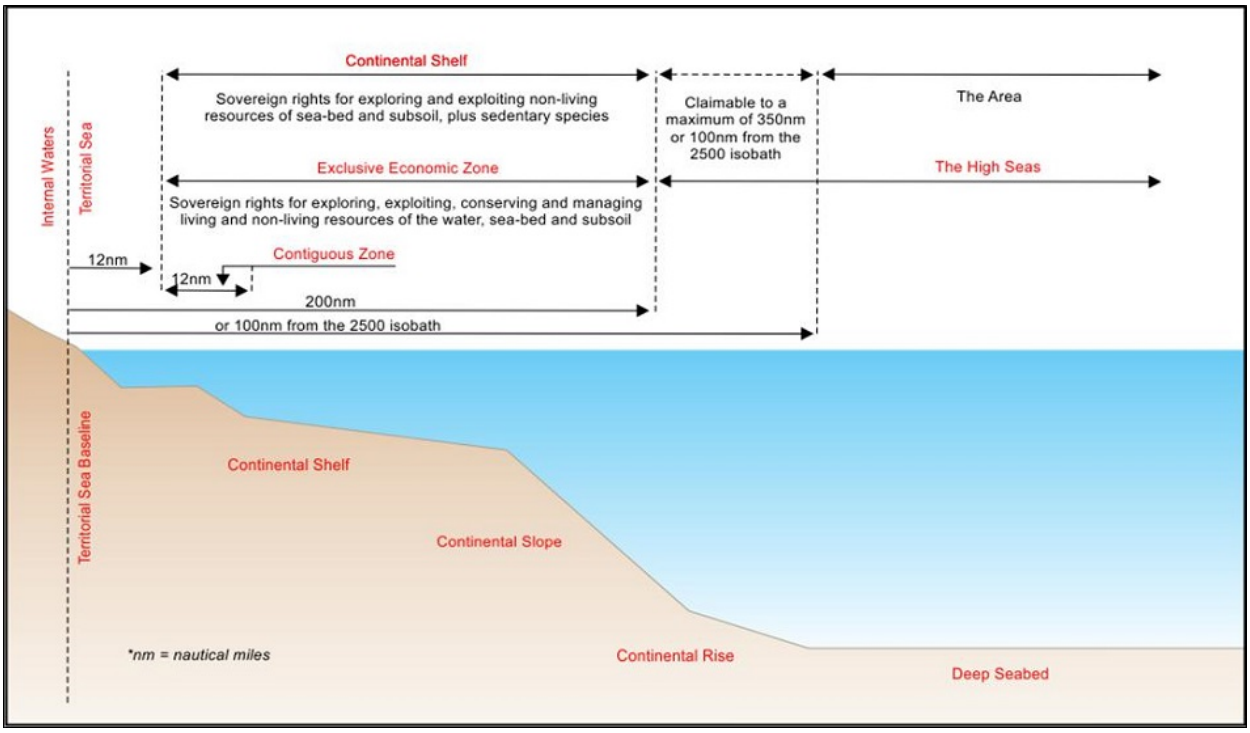
As of 20 August 2020, the Convention had been signed by 167 States (countries) and the European Union. The United States of America is currently not a party to the Convention.

Figure 3.2 Map of seafloor jurisdictions



Note: International seabed area map (blue zone) as well as 200 nautical mile exclusive economic zones (grey zone) and extended continental shelf zones (orange zone). Source: Marine Geospatial Ecology Lab, Duke University (2011).

Figure 3.3 Maritime space under the 1982 UNCLOS



Source: DeepGreen - adapted from UNCLOS, 1982

3.1.2 International Seabed Authority

The ISA is an autonomous international organisation established under the Convention and the 1994 Implementation Agreement to organise and control activities in the Area, particularly with a view to administering and regulating the development of the resources of the Area in accordance with the legal regime established in the Convention and the 1994 Implementation Agreement.

All rules, regulations, and procedures issued by the ISA to regulate prospecting, exploration, and exploitation of marine minerals in the Area are issued within a general legal framework established by the Convention and the 1994 Implementation Agreement.

To date, the ISA has issued (https://www.isa.org.jm/mining-code/ Regulations):

- The Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted 13 July 2000; the Regulations).
- The Regulations on Prospecting and Exploration for Polymetallic Sulphides (adopted 7 May 2010).
- The Regulations on Prospecting and Exploration for Cobalt-Rich Ferromanganese Crusts in the Area (July 2012).

The ISA is currently working on the development of a legal framework to regulate the exploitation of polymetallic nodules in the international seabed area.

In 2014, the ISA completed a study looking at comparative extractive regulatory regimes. This was followed in March 2014 with a stakeholder survey seeking comments on what financial, environmental, and health and safety obligations should be included under the framework (ISA 2014).

In March 2019, the Council of the ISA released the advance and unedited text (English only) of the Draft Regulations on Exploitation of Mineral Resources in the Area (ISBA/25/LTC/WP.1) (ISA, 2018). The revised draft incorporated the consideration of requests addressed to the Legal & Technical Commission by the Council during the first part of the 24th Session in March 2018, comments by the Commission, and also reflected the responses to the first draft from stakeholder submissions. The ISA declared a target of July 2020 to have the regulations approved, however the July session was deferred as a result of COVID-19 pandemic.

Pursuant to paragraph 15(a) and (b) of Section 1 of the annex to the 1994 Implementation Agreement, which relates to article 162 (2)(o)(ii) of the Convention, the ISA Council must also adopt such exploitation regulations within two years of a formal request being made by any State which intends to apply for approval of a plan of work for exploitation.

3.2 TOML Obligations

The contract for exploration for polymetallic nodules contains conditions covering such areas as obligations of the sponsoring state, environmental obligations, marine scientific research, fees, and work programmes.

3.2.1 Work Programme

Under ISA requirements contractors are required to submit five-year work programs. The first TOML five-year work program was completed in 2016 and reviewed and accepted by the ISA in late 2016.

For the second five-year period ending in 2022 TOML proposed the following program.

- Continue environmental baseline work;
- Complete pilot testing;
- Complete geotechnical studies;
- Complete feasibility studies;
- First draft EIA/EMP;
- Continue training.

TOML noted that the program was:

- Dependent on success at each stage;
- Subject to change based on findings at hand at any particular time; and
- Reliant on funding which in turn is dependent to some extent on macro-economic conditions and development with regards to the Authority and its stakeholders.

As a result of the financial state of the company, TOML did not progress at the rate intended until TOML was purchased by DeepGreen in March 2020. TOML currently plans an aggressive program of offshore campaigns in 2021 – 2023 focussing on resource assessment and environmental base line studies with the objective of upgrading the TOML F resource area to Indicated Mineral Resource status and completing environmental baseline studies and ESIA for the TOML F resource area.

TOML plans to collaborate closely with NORI on offshore technology development as well as progressing in parallel proprietary nodule collection technology developed by TOML. TOML and NORI will collaborate closely on the development of nodule processing solutions.

3.2.2 Royalties and Taxes

Royalties and taxes payable on any future production from the property will be finalised once the ISA has developed an ‘exploitation code’. This was formally proposed as a project by the Secretary General of the ISA and endorsed at the 17th Annual Session of the ISA. Any code will need to honour the key principles of UNCLOS.

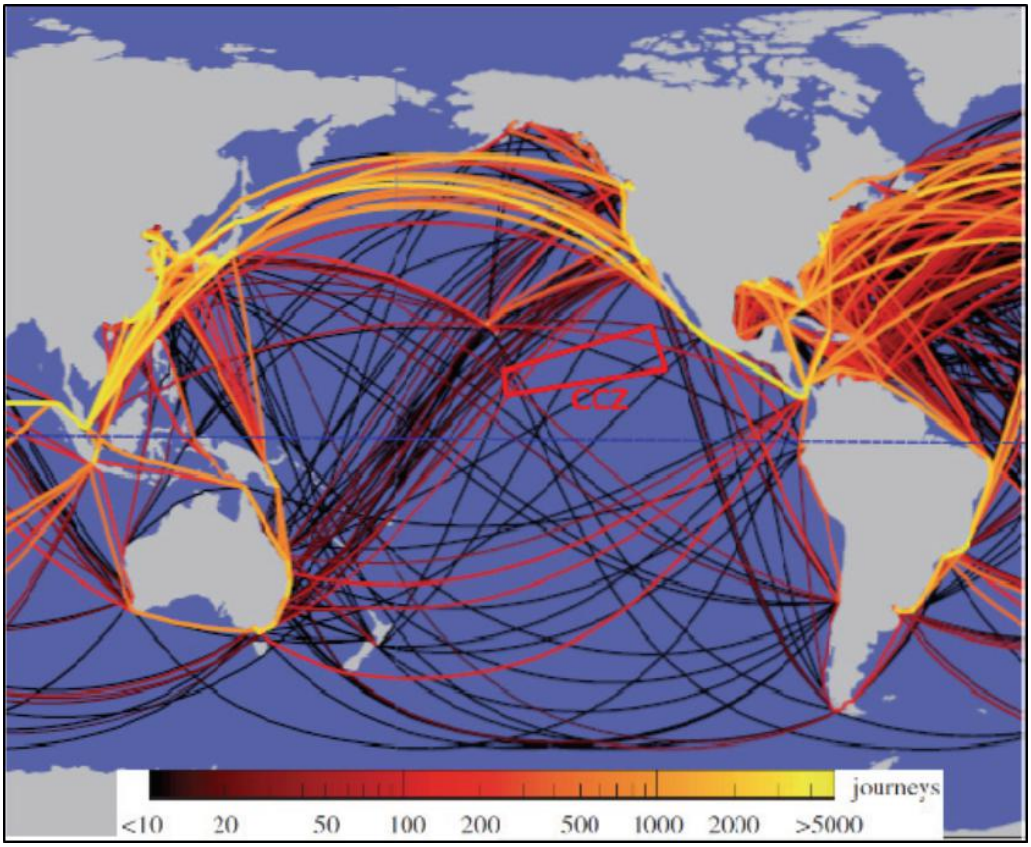
TOML has agreed to pay a royalty with the Tongan government for each tonne of nodules collected from the TOML area from commercial operations in return for sponsorship.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Accessibility and infrastructure

The CCZ lies between Hawaii and Mexico and is accessible by ship from various ports in the United States and South America. As the CCZ deposit does not include any habitable land and is not near coastal waters, there is no requirement to negotiate access rights from landowners for seafloor mining operations. All personnel and material will be transported to the project area by ship. The region is well located to ship nodules to the American continent or across the Pacific Ocean to Asian markets. The CCZ is generally outside major shipping lanes as indicated in Figure 4.1 which shows the global cargo shipping network, illustrating the trajectories of all cargo ships bigger than 10,000 gross tonnage during 2007.

Figure 4.1 Global cargo shipping network



Note: Colour scale indicates the number of journeys along each route. Adapted from Kaluza et al. 2010.

4.2 Climate

The CCZ has a tropical oceanic climate, with average temperatures of from 20 °C to 32 °C. Minimum and maximum temperatures generally occur in March and September, respectively (ISA 2001), and the average sea surface temperature is 25 °C. The CCZ is located in open ocean and is subject to tropical weather patterns.

Off-shore operations are planned to run throughout the year, with the exception of hurricane events, which are expected to occur once every three years for any given location. Tropical hurricanes are difficult to predict due to their erratic frequency but have high intensity over short periods and occur mostly during the period from May to October (Tilot, 2006, GSR 2018).

5 History

Manganese precipitation in the deep oceans has probably been a widespread natural process for at least the last 500 million years, which is probably when the deep-oceans first oxidized (Fike et al. 2006). The nodules currently found on the seabed within the Clarion Clipperton Zone (CCZ) are constrained by the age of the Pacific Ocean crust itself and published dating indicates that they are probably no more than several million years old (e.g., Chang et al, 2005).

This history of exploration of the CCZ can be considered in four periods:

1 The discovery of the Clarion Clipperton Zone (1875-1969).

2 The International Decade of Ocean Exploration (1970-1981).

3 The Reciprocating States Regime and the Pioneer Investors (1982-1995).

4 The International Seabed Authority (1996 to present day).

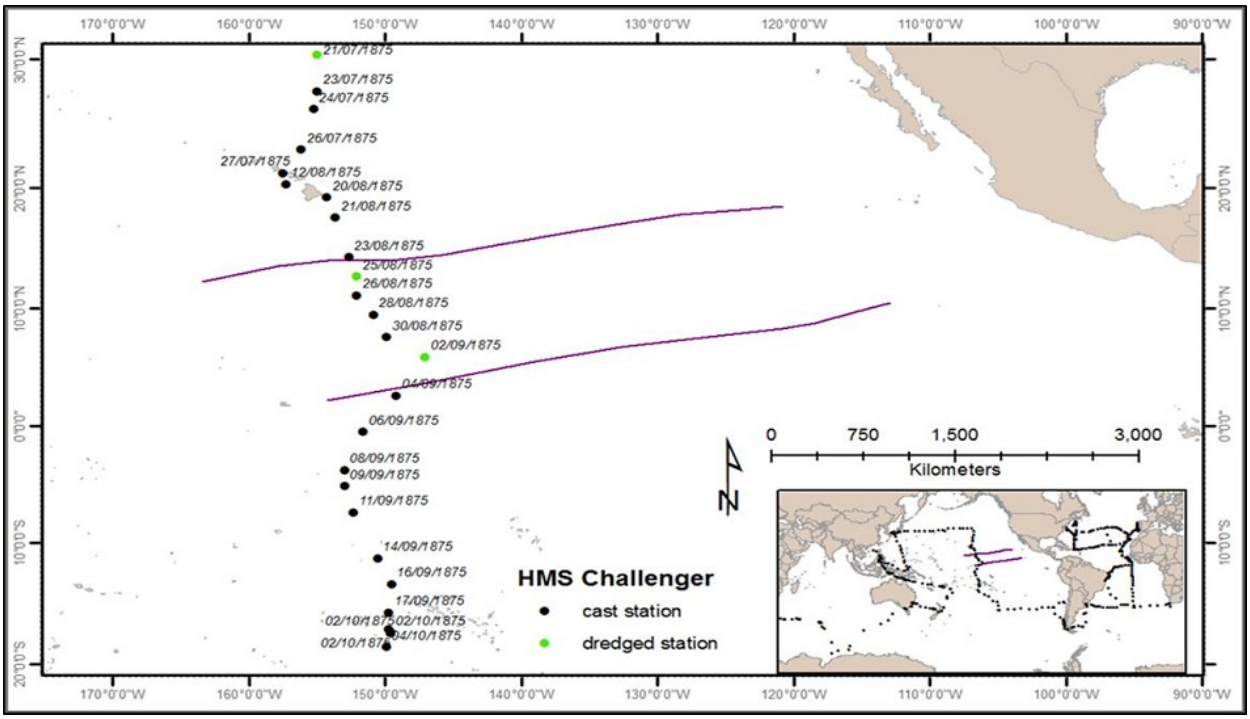
5.1 1875–1969: Discovery of the Clarion Clipperton Zone

5.1.1 First Samples

Polymetallic nodules were first reported in the Arctic Kara Sea (Ingri, 1985) and then by the British HMS Challenger expedition, in February 1873, in the Atlantic Ocean off the Canary Islands (Murray and Renard, 1891). Fossil nodules had already been found in the Alps by C.W. von Giimbel in 1861 (Jenkyns, 1977).

Although the HMS Challenger was primarily sail driven, new technology in the form of a steam engine enabled her crew to winch up nodule samples at 50 of the 343 seabed sample stations surveyed by the ship. Two of these sample stations are in what was later to be called the CCZ (Murray and Renard, 1891; Figure 5.1).

Figure 5.1 Path of the HMS Challenger



Location data from Natural History Museum UK, (2014)

The expedition resulted in numerous oceanographic discoveries including the widespread nature of nodule deposits on the deep-ocean floor. Confirmation of the extent of nodules in the Pacific was made by a contemporary of Murray and Renard, Alexander Agassiz (Mero, 1965) who made several expeditions aboard the US Fish Commission's USS Albatross around the turn of the century, including one through the central Pacific to the Marquesas Islands. At this time nodules were only seen as items of scientific curiosity.

5.1.2 Commercial Recognition

After the Second World War a Swedish expedition reportedly recovered nodules (United Nations, 1979), and interest in exploring seabed nodules started to increase again in the 1950s (as reflected in the publication rate on the subject; Meylan et al, 1976), with people like John Mero (Mero, 1965) promoting their potential with some success. Early exploration efforts and discussion were spread around the planet but based on less than 100 samples collected from the CCZ, Mero predicted the occurrence of many millions of tons of deposits with nickel and copper concentrations each greater than 1% as well as significant manganese and cobalt (Mero 1965).

Two of the early explorers in the 1960s were the USSR and the US companies Kennecott Exploration Inc and Deepsea Ventures. All started exploring in areas other than the CCZ, and it was only in the late 1960s and early 1970s that it became apparent that the CCZ had the best nodule fields in the world in terms of both grade and abundance (McKelvey et al, 1979). By the late 1960s and early 1970s, these explorers had been joined by others. Their efforts are detailed in subsequent sections.

5.1.3 USSR

The USSR started an integrated marine research programme in 1949, led by the USSR Academy of Sciences. Regular expeditions commenced with the RV Vitiaz and later the RV Dmitri Mendeleyev, starting with at least three campaigns to the Indian Ocean (Bezrukov and Andrushchenko, 1972; Bezrukov, 1962, 1963) then in the southwest Pacific (e.g., Skornyakova et al. 1990), including the Penrhyn Basin near the Cook Islands, and then in the central Pacific (Bezrukov, 1969). Over twenty years, some seventeen Soviet expeditions included at least some research on nodules.

By the late 1960s the focus of Soviet exploration shifted to the Clarion Clipperton Zone. Hundreds of samples and thousands of photos were taken along with seafloor bathymetry mapping during two campaigns. Some mineral inventory estimates were also made (Skornyakova and Andrushchenko, 1964).

5.1.4 Kennecott

Source Dave Felix and John Halkyard (pers comm. 2015), unless referenced otherwise.

Kennecott Copper Corporation became interested in manganese nodules in part based on the publications of Dr. John Mero (e.g., Mero, 1965) and work being done at Scripps Institution of Oceanography in the 1960s. Through their subsidiary Bear Creek Mining, Kennecott's first exploration campaign dates back as early as 1962, when 10 tons of nodules were dredged from a site west of Baja California. For the next few years, the group relied on technical associations with oceanographic research campaigns (Killing, 1983) but Kennecott followed up with two more of their own campaigns in 1967. That year, newly designed free fall grabs were used for the first time during the "Clarion" campaign, while the "Confidence" campaign investigated a portion of the CCZ with 143 sample stations, bottom photos and dredge hauls.

In 1969, Kennecott Exploration Inc (KEI) was formed and between 1970 and 1974 KEI conducted another seven campaigns, with progressively more detailed sampling and survey work including dredging for bulk samples (up to 197 tons of nodules and 400 cubic ft of sediment in 1972; Isaacs, 1973). In 1970, on the Crux Campaign, KEI discovered what they called the Frigate Bird deposit in the eastern CCZ (Figure 5.4).

Many exploration techniques and nodule deposit characterization methods were developed and used successfully, but these were never publicly released. Some of the techniques developed at this stage are still used today (e.g., large diameter box-coring and photographic analysis (Felix, 1980).

5.1.5 Deepsea Ventures Inc

Deepsea Ventures' first campaigns were in the mid-1960s in both the Atlantic (Blake Plateau off Florida) and Pacific (ISA, 2004). They were supported by US academic efforts (e.g., Fuerstenau et al, 1973) which focussed on the geochemistry of nodules and their metallurgical processing.

In the summer of 1970, the company conducted successful collector and air-lift trials at a depth of 762 m on the low metal grade nodule deposits of the Blake Plateau (Kaufman and Latimer, 1971; Lecourt and Williams, 1971; Geminder and Lecourt, 1972; United Nations, 1979). Deep Sea Ventures equipped the Deep-Sea Miner, a 6,750 t freighter, with a 25 m derrick and a 6 m by 9 m central pool (the space from which the subsea devices are deployed). The nodules were raised by airlift, a system previously tested in a 250 m mine shaft (ISA, 2004). The towed collector sled was fitted with a series of tines to exclude material above a certain cut-off size and thereby reduce the chance of pipe string clogging. Material passing the first set of tines was channelled to the suction point by a second set of more closely spaced tines. The first nodules arrived aboard the mining vessel on July 30, 1970. Pumping rates between 10 and 60 tons/hour were successfully achieved during this pre-production mining trial (EC, 1997).

German groups also started working with Deepsea Ventures in 1970 (Backer and Fellerer, 1986) and were more formally involved when Deepsea Ventures went on to form the OMA consortium in the mid-1970s. OMA by then had changed focus to their claim area covering the higher-grade nodules in the central CCZ.

5.2 1970–1981: The International Decade of Ocean Exploration

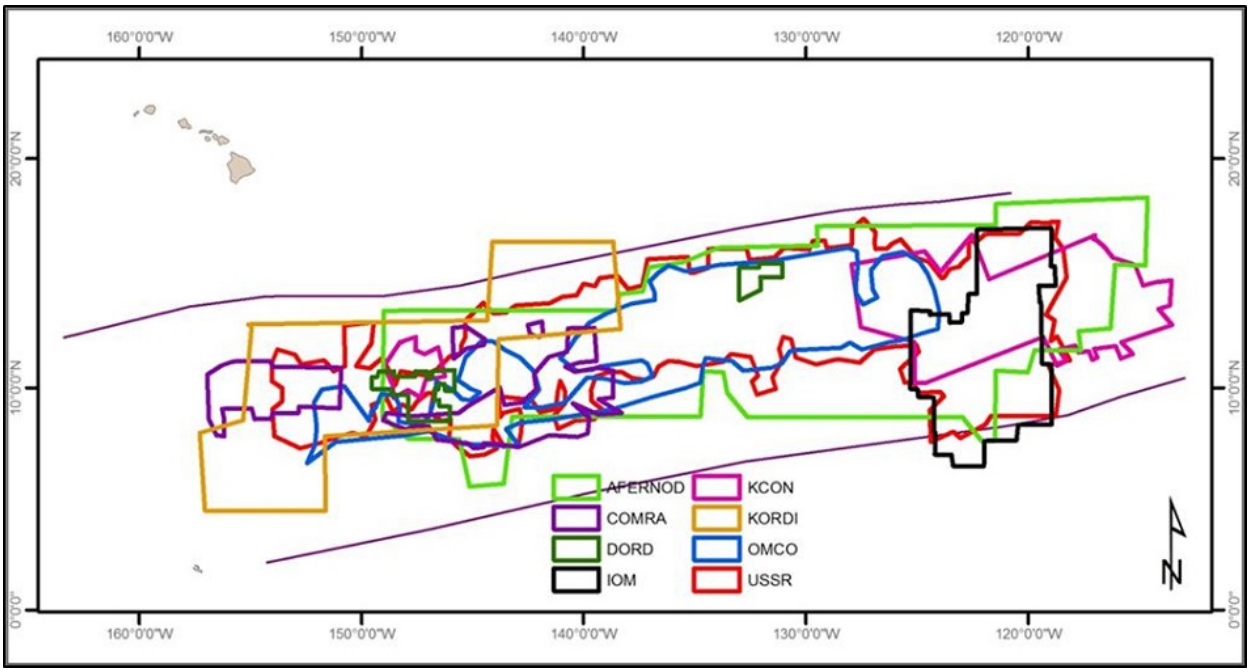
As interest grew through the 1960s, more and more commercial and government funded organizations started exploring the oceans, especially within the CCZ.

The International Decade of Ocean Exploration (IDOE) was an international, collaborative programme to improve the use of the ocean and its resources for the benefit of mankind. It nominally spanned 1970 to 1980 (DOMES, 1981). By 1975 IDOE counted 46 nations as members, including cold world adversaries, the USA and USSR. The US participation was coordinated by their National Science Foundation. Programmes managed by IDOE were mostly scientific in nature including a large environmental research component. IDOE was charged to "Improve worldwide data exchange through modernizing and standardizing national and international marine data collection, processing, and distribution."

The United Nations was keenly aware of the significance of exploiting resources under international jurisdiction and debated how this resource should be managed. On 12 December 1970, the General Assembly of the United Nations adopted 2749 (XXV) "Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction" (United Nations, 1970). This followed negotiations which took place in a specially established Seabed Committee. This document declares the bed and ocean floor, beyond the limits of national jurisdiction, to be the common heritage of mankind (Guntrip, 2003).

The UN's efforts eventually led to development of the Third United Nations Convention on the Law of the Sea, but with a regulatory regime not yet in place, this period of the International Decade of Ocean Exploration is characterized by totally independent and usually overlapping areas of exploration as shown in Figure 5.2.

Figure 5.2 Examples of the overlapping exploration areas of some of the first explorers



Sources: ISA, (2010), Menot et al (2010), Jeong et al (1994)

5.2.1 USSR

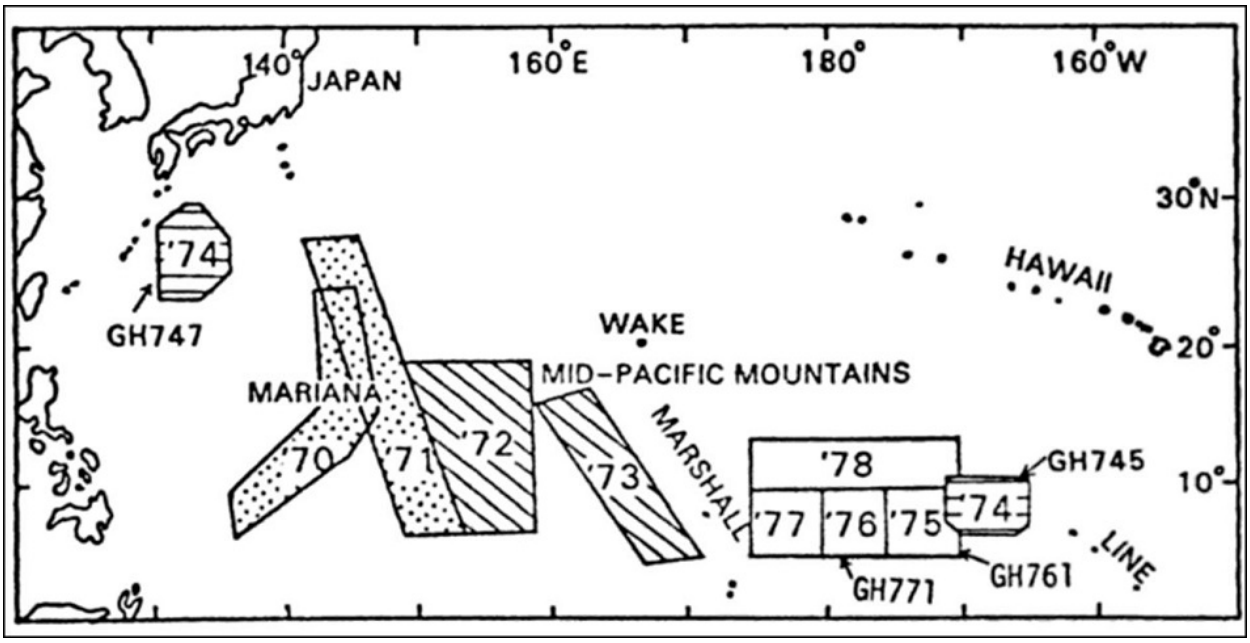
Source Andreev (pers com March 2016), unless referenced otherwise.

During this period Soviet studies of the ocean floor continued from their efforts in the 1960s. From 1976 the USSR Academy of Sciences was joined by State scientific-production enterprises “Sevmorgeologiya” (St.-Petersburg) and “Yuzhmorgeologiya” (Gelendzhik), subordinated to the Ministry of Geology of the USSR. Publications from this period include monographs (Bezrukov, 1976, 1979; Volkov 1979) and numerous magazine articles (e.g., Bazylevskaya, 1973, Skornyakova et al. 1981).

5.2.2 Japan

Japanese companies were easily the most prolific participants in nodule exploration and development in the 1970s, usually through large consortia such as DOMA and DORD (UNOETO, 1979). Japanese government efforts started in 1974 using their newly commissioned research vessel the Hakurei-Maru which was given two main projects: “Marine geological investigations on continental shelves and shores around Japan” and “Investigations on deep-sea manganese nodule deposits” which focused mostly on the Central Pacific Basin (Figure 5.3). These efforts concluded in 1984.

Figure 5.3 Areas researched by the Geological Survey of Japan in the 1970s



Source: UNOETO, 1979

5.2.3 Kennecott Consortium (KCON)

Kennecott continued their exploration in the early 1970s attracted by the large informal resource estimates for nickel and other metals. Kennecott also commissioned preliminary feasibility studies of mining by Lockheed Missiles and Space Company and Global Marine Development, Inc., starting in the late 1960s. Kennecott's corporate processing research centre in Lexington Massachusetts was charged with developing a metallurgical process for nodules with the Kennecott Computing Center in Salt Lake City being made responsible for resource estimates.

As the scale of the needed investment and level of required offshore expertise became apparent, Kennecott reached out and sought partners to share the risk. The KCON consortium was formed in 1974 based on the petroleum industry model of an operator (Kennecott Copper Corp) responsible for execution of work and supporting partners. The partners were Kennecott (50%), Rio Tinto Zinc (20%), Noranda (10%), Consolidated Gold Fields (10%) and Mitsubishi (10%) (Killing, 1983). Subsequently Rio Tinto Zinc sold half their shares to BP Petroleum Development Ltd. The Consortium was led by a Committee of Representatives (COR), which approved plans and budgets, and a Technical Advisory Committee (TAC) of technical experts from each partner which helped prepare the plans and review progress. Several engineers from the partner organizations were seconded to the KCON laboratories, principally the Ocean Mining Laboratory in San Diego, California.

The exploration work described above ended up with two areas of interest for KCON (Figure 5.4):

1 The Albatross area in the central part of the CCZ, which ultimately became the "USA4" license in 1984 (U.S. Department of Commerce) under the Reciprocating States Agreement (Figure 5.13).

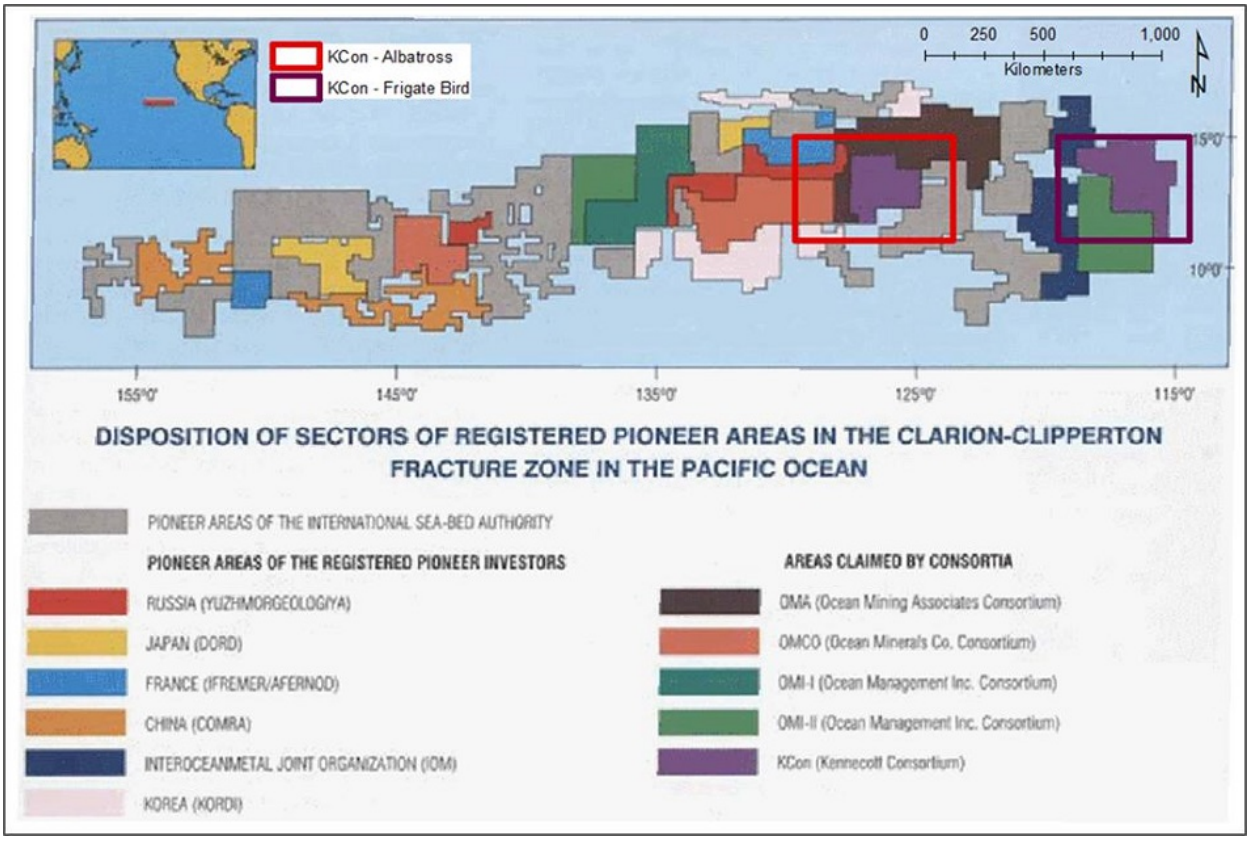
2 The Frigate Bird area in the eastern part of the CCZ which ultimately became the "UK" License in the early 1980s.

This consortium developed many of the best exploration techniques used in the CCZ including large capacity box-coring and photographic survey (Felix, 1980). Ultimately KCON reached an unpublished "inferred reserve" for parts of their concessions (David Felix pers comm. 2015). This included definition of "mineable units" on the seafloor.

Once exploration was completed the consortium developed mining system designs, numerical models and tested various components of a commercial mining system (Halkyard 1980, 1982). The development work included a towed nodule pick-up system which was tested at approximately 1/5th scale (Morgan, 2011; Heine and Suh, 1978), a hydraulic and airlift system which was tested on land (Burns and Suhm, 1979; Doyle and Halkyard, 2007), and study of nodule attrition including several pump loop simulations, material handling and transportation (Halkyard, 1979).

Metallurgical development included pilot scale testing of the patented “Cuprion” atmospheric pressure ammoniacal leach process (Skarbo, 1975; Agarwal and Beecher, 1976; Agarwal et al, 1978). A 200-ton bulk sample of nodules collected in 1972 (Isaacs 1973) were intended for a large-scale metallurgical pilot test. These nodules were stored in Safford, Arizona, however the samples were disposed of in the 1990s.

Figure 5.4 Kennecott priority areas of interest in the CCZ



Modified from Yamazaki (2008b)

A comprehensive cost estimate of a commercial mining venture was carried out by KCON between 1978 and 1980. The mining and processing research conducted by KCON in the 1970s was consolidated into a commercial system design and execution plan. This work was performed by Bechtel Corporation with support for the mining system provided by Global Marine Development, Inc. Two sites were selected for the land-based processing plant: Southern California near Los Angeles and the West Coast of Mexico at Lazaro Cardenas, Michoacan, Mexico. Bechtel developed preliminary Cuprion plant designs and cost estimates for both sites. Extensive investigations were conducted into permitting requirements and options for tailings disposal. Lazaro Cardenas was under development as a deepwater port and an industrial hub to support Mexico’s industrialization plans. Meetings were held at a high level with Mexican officials who were encouraging KCON to consider a development at Lazaro Cardenas.

The cost estimate was based on a 3 Mtpa manganese nodule project producing about 88,000 lb per year of nickel and associated copper, cobalt and molybdenum. KCON never considered manganese a viable product. The overall conclusion of the KCON/Bechtel study was that at the time nodules could be cost competitive with new sources of nickel, but not with current sources (Dubs, 1983). Also, Kennecott and other industry representatives believed the then terms of the newly negotiated Law of the Sea Treaty would introduce unacceptable risk to the project.

KCON worked with government officials and other interested consortia in establishing a framework which would permit restructuring of Part XI of the Law of the Sea Treaty in a form acceptable to KCON and other active mining consortia. However, as time dragged on KCON progressively wound up their operations, stopping active exploration and closing their Ocean Mining Lab in La Jolla in 1981.

KCON applied for and received an exploration license for a segment of its exploration area under the US Deep Seabed Hard Minerals Resources Act in 1984 (USA-4). Although some ad hoc evaluation continued after this, in May 1993, KCON abandoned their license under the US Act. The consortium was dissolved. In June 1993, Ocean Minerals Company (OMCO) submitted to NOAA an exploration license application from the former KCON license area USA-4. OMCO also acquired the exploration data for the KCON sites.

5.2.4 Ocean Mining Associates (OMA)

The OMA consortium comprised Essex Minerals Company (US), Union Seas Inc (Belgium), Sun Ocean Ventures (US), with Deepsea Ventures Inc the consortium’s service contractor (ISA, 2004).

In 1976, six years after the Drake Plateau trials discussed above, OMA started a programme to trial mine nodules in the CCZ. OMA equipped the Wesser Ore, a 20,000 ton iron ore carrier, with a moon pool, a derrick and revolving thrusters. The ship had the two central holds converted for equipment and the moon pool, a forward hold set aside for general use and three holds combined into two for nodule storage. The ship’s derrick was covered by a distinctive dome, whose purpose was mostly to keep proprietary technology hidden. The nodules were collected by a suction dredge towed on skis behind a rigid riser and were raised by airlift. The collector was at 1/5th scale except for the collector inlets which were at full design scale.

The ship renamed Deepsea Miner II (Figure 5.5), conducted its first tests in 1977 at 1,900 km southwest of San Diego, California. The tests were suspended because the electric connectors along the pipe string were not completely waterproof. Early in 1978, two further trials encountered new difficulties when the dredge floundered in bottom sediment and a cyclone struck. The latter situation was dangerous as the riser could not be retrieved in time (it took well over 6 hours to recover), so the ship had to ride out the full fury of the storm (later voyages included an emergency explosive detachment system for the riser). Finally, in October 1978, 550 tonnes of nodules were lifted in 18 hours, at a maximum capacity of 50 ton/h. The test was stopped after a blade broke in a suction pump. Ultimately the nodules recovered were taken to Belgium (home of Union Seas Inc) and used for attrition testing in a three-phase loop system (University of Virginia (2015)).

Figure 5.5 Ocean Mining Associate’s Deepsea Miner II



Source University of Virginia (2015)

5.2.5 AFERNOD

Unless referenced otherwise source is Ifremer (1994) or Menot et al. (2010).

French interest in exploration and mining of Pacific nodules dates back to the mid-1960s but field work commenced in early 1970 when the Company “Société Le Nickel” (SLN) and the National Centre for the Exploitation of Oceans (CNEXO), which later became today’s Ifremer (Institut Français de Recherche pour l’Exploitation de la Mer), began studying the nodule deposits, focusing near the Marquesas Island Group (French Polynesia) (IFREMER, 1994, Menot et al, 2010).

In 1974, the Commissariat à l’Energie Atomique (CEA) and the Chantiers de France-Dunkerque, which in the meantime became Chantiers du Nord et de la Méditerranée (NORMED), formed a joint venture called Association Française d’Étude et de Recherche des Nodules Océaniques (AFERNOD). AFERNOD focused more on the CCZ.

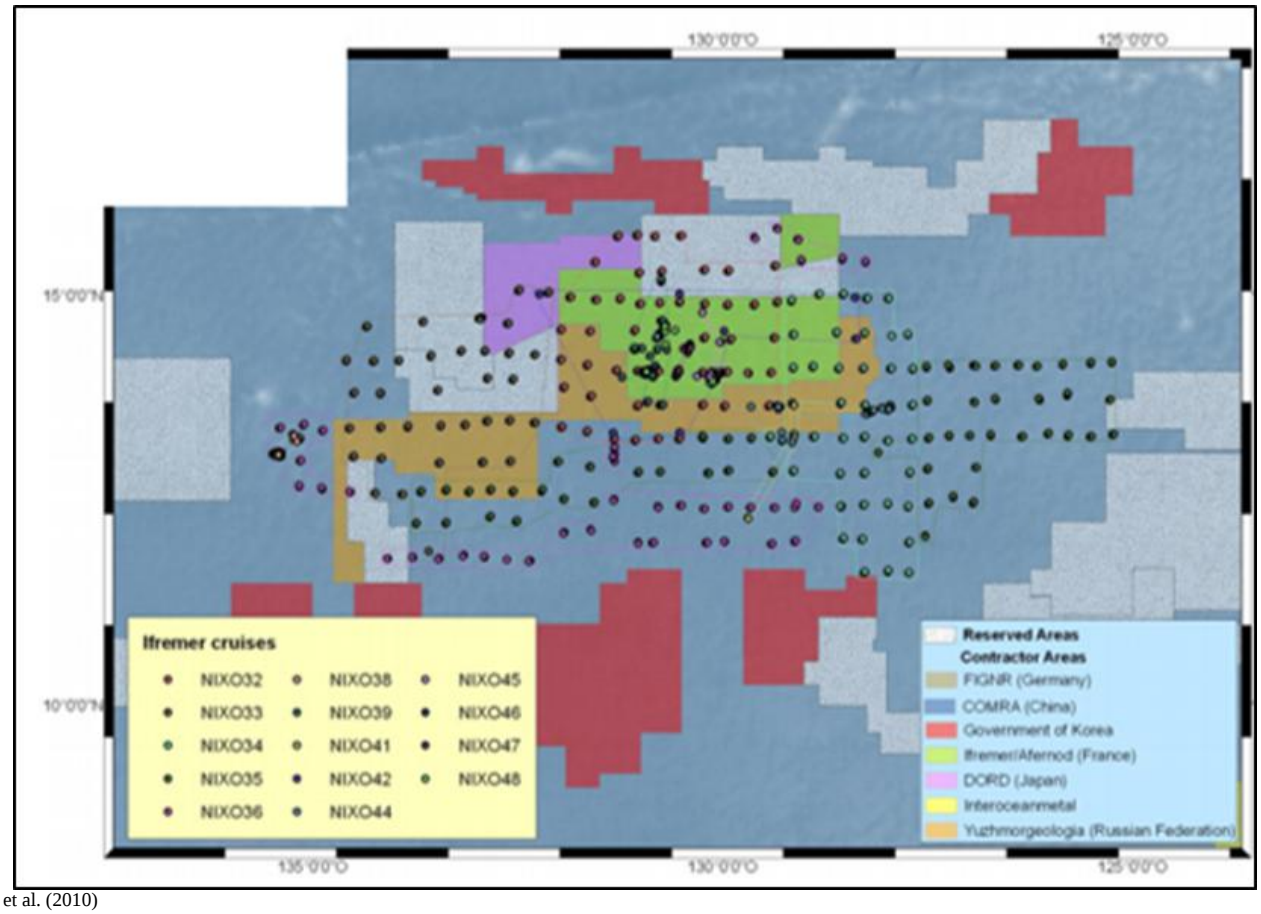
In 1984 Ifremer and CEA (via their subsidiary TECHNICATOME) formed GEMONOD (which stands for Groupement pour la mise au point des MOyens nécéssaires à l’exploitation des NODules) which led the development programme of the technology of exploitation of nodules funded by the French government until 1988. Thereafter Ifremer resumed management of all aspects of the project.

AFERNOD used four research ships for most of their work during the 1970s, the Coriolis, the Noroit, the Suroit, and Jean Charcot. They also used one of the world’s first AUVs, the Epaulard, and the manned submersible Nautile.

Between August 1975 and September 1976, the French explored the entire CCZ at a wide but systematic scale with nine campaigns (called NIXO20 to 28). A wide range of technology was used in the exploration effort, but it appears that clusters of free fall grabs were typically used at each sample site.

Analysis of exploration results of the area led to definition of two domains, with one having more continuous grade characteristics. For the next phase the AFERNOD selected an area with consistent grade and typically higher abundance, the 431,500 km^2 "NORIA" area (NOdules RIches et Abondants). The eastern parts of this area coincide with KCON's Albatross Area (Figure 5.6). Work at NORIA between 1976 and 1977 started with several thousand kilometres each of sonar, magnetic and seismic survey. This was followed by six campaigns of sampling and photographic survey.

Figure 5.6 Samples in the NORIA Area



Source: Menot et al. (2010)

A "mining area" of 150,000 km^2 was then selected from the NORIA area for further work starting in 1979. This worked focused on mapping the seafloor topography and nodule abundance. The latest technologies such as multibeam echo sounding (MBES) and AUV survey were brought to the problem as well as more detailed towed surveys.

5.2.6 Ocean Mining INC. (OMI)

Unless referenced otherwise the following is sourced from Brockett (pers comm. 2016) or Brockett et al. (2008).

The International Nickel Company (INCO) first became interested in deep-ocean mining for manganese nodules back in 1958, but it was not until late in 1971 that INCO opened its Ocean Mining Development office in Bellevue, WA. During those early years, INCO contracted with outside organizations (John Mero, Dames and Moore, and Deepsea Ventures) to assist with exploration activities including several survey campaigns. INCO then explored in their own right with the MV Growler.

A first generation mechanised self-generating collector concept delivered by contractor Ocean Science Engineering in 1972, proved unworkable in trials in Discovery Bay, Puget Sound.

INCO made the decision to develop their collector systems in-house and set about designing what became internally known as the “Electro-Hydraulic” (EH) collector that was subsequently patented in 1976. INCO constructed a version of the EH collector designed to be tested on a cable and scheduled a deep-sea collector test in the CCZ in the early 1970s. Unfortunately, the collector, its instrumentation system, and a 7600 metre electro-mechanical tow cable were lost during a shallow water test off the coast of Oahu, Hawaii. That loss triggered INCO’s decision to search for joint venture partners leading to the formation of OMI.

In 1975 the OMI consortium was created, led by INCO and including AMR of Germany, DOMCO of Japan and SEDCO of the USA.

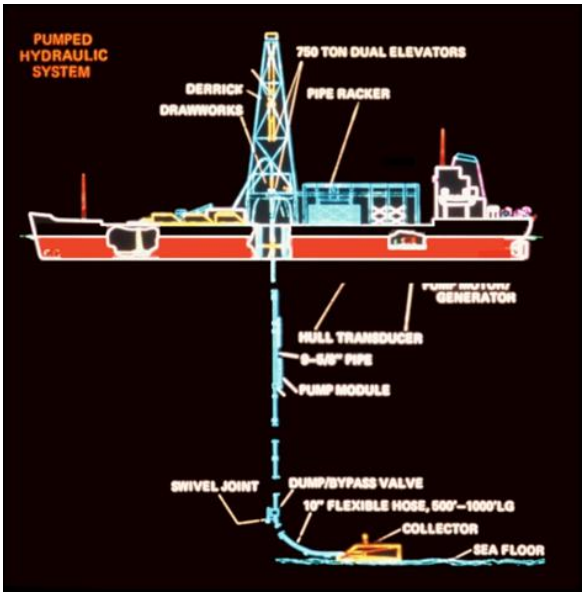
AMR was given responsibility for the exploration programme within OMI and INCO was assigned responsibility for collector development (Brockett and Kollwentz, 1977). However, both AMR and DOMCO assisted with the design and construction of prototype test collectors. INCO excavated a land based collector test facility in Redmond, WA, and early in 1976 tested eight collectors of various designs.

In 1976 the OMI collector team used the RV *Valdivia* to conduct in-situ collector tests in the CCZ. Two collectors were chosen for a subsequent pilot mining test; the DOMCO hydraulic design and the AMR cutter blade scraper design. Two of the hydraulic collectors were constructed, one with a two metre wide active collection width and one with a three metre wide collection width.

The developmental mining system tested was configured around the SEDCO 445 drill ship which was a 445’ vessel (Figure 5.7). A riser pipe assembled with 9-5/8” diameter oil field casing (Figure 5.9) extended from the gimbaled rig floor on the ship to within 50 metres of the seafloor. This gimbaled rig floor was important for safe and efficient operations and allowed the casing to be safely lowered and the collector deployed without damage. The addition of motion compensation equipment completed the list of requirements for creating the stable platform to carry out successful deep mining operations. The weight of the riser pipe, pumps, instrumentation and collector assembly was over 450 metric tons.

During the pilot mining testing, OMI tested both a hydraulic submersible pump (Figure 5.9) and an air injection lift system to raise the nodules from the seafloor to the surface. The interface between the seafloor collector and riser pipe was a structurally strengthened flexible hose to accommodate variations in seafloor bathometry. Above the flexible section of hose a deadweight was installed to control riser pipe lift-off during towing operations. Next in line was a dump valve to prevent nodule clogging in the riser pipe during mining shutdowns. There was also a vacuum relief valve in the lower assembly to prevent collapse of the flexible hose in the event the collector became jammed with nodules.

Figure 5.7 OMI Pilot Mining System Configuration and the SEDCO 445 off Honolulu





While the primary function of the collector was to gather the nodules from the seafloor, there were secondary functions; rejecting the oversized and undersized nodules, eliminating unwanted sediment, and introducing the nodules into the riser system. In addition to providing a conduit for lifting the nodules to the surface, the riser pipe was used to tow and navigate the seafloor collector through the mine site. Once on deck, an air, water and nodule separator directed the nodules to conveyors (Figure 5.10) for transporting the nodules to the ship holds and on deck storage containers. Any superfluous water and entrained sediment was returned to the ocean under supervision of NOAA environmental scientists associated with the DOMES project.

Three test campaigns culminated a four-year research and development programme by OMI to determine the technical feasibility and economic viability of deep-ocean mining at the time. The pilot mining test was conducted in more than 5,250 metres of water.

Figure 5.8 INCO electro-hydraulic collector test; DOMCO hydraulic collector launch & recovery test on the RV Valdivia

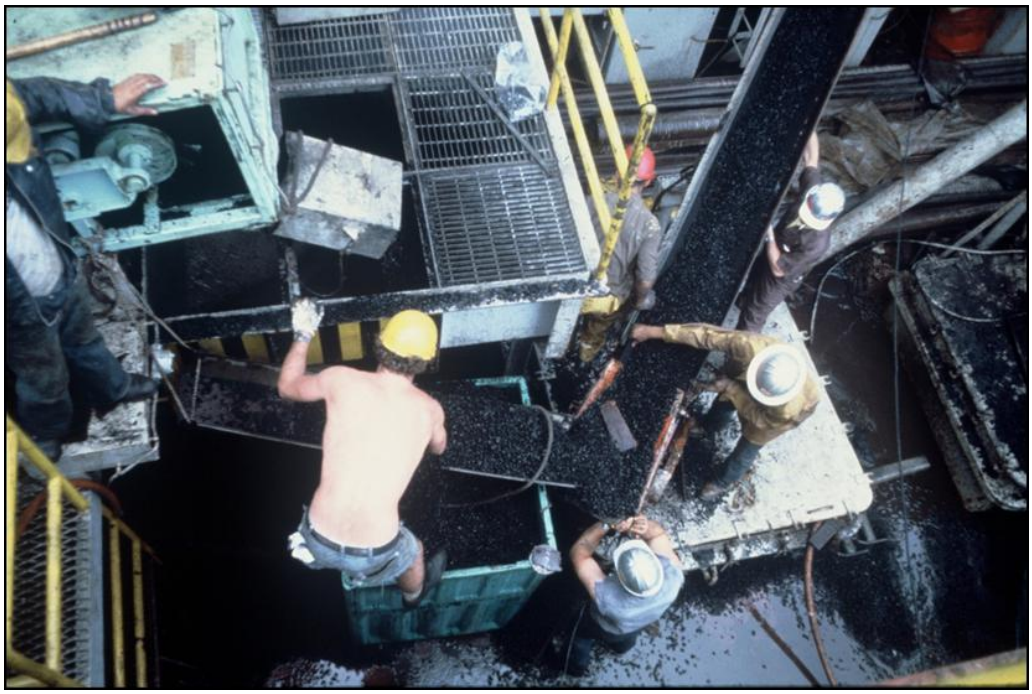




Figure 5.9 Connection of riser to collector and in-line submersible pump



Figure 5.10 OMI Transport Conveyors Overflowing with Nodules



The OMI team, operating aboard the SEDCO 445 drill ship successfully recovered over 800 metric tonnes of nodules during these tests during the summer of 1978. The submersible pump system recovered approximately 650 tonnes of nodules while the air lift system recovered 150 tonnes. Nodule throughput varied dramatically throughout the tests with the rate exceeding 40 tonnes per hour at times causing the material handling systems and storage containers on the mining ship to overflow with nodules (Figure 5.10).

Most of the 800 tonne sample was shipped to INCO's Port Colbourne research facility for process testing and development. There it was processed into Ni-Cu-Co matte which was distributed to the consortium partners for further evaluation.

Kollwentz (1990) discusses the challenges faced by OMI (and thus by the other commercial consortia) both leading up to, during, and most critically after the successful pilot mining trial. Issues relating to the project specifically revolved around management and related technology development (the nodule consortia were some of the earliest large complex joint ventures; Killing, 1983).

5.2.7 Ocean Minerals Company (OMCO)

Ocean Minerals Company comprised US and Dutch interests, namely: Ocean Systems of Lockheed Missiles and Space Company Inc., Amoco Minerals Co, Billiton International Metals BV and Boskalis Westminster (UNOETO, 1979).

In 1978, following the end of the infamous Project Azorian (CIA, 2012), OMCO rented the Glomar Explorer from the United States Government (Spickerman, 2012) to use as the pilot mining vessel. The Glomar Explorer (Figure 5.11) had been built to raise a sunken Russian submarine but had used nodule mining as a cover story. The OMCO partners thus sought to leverage off much of the already completed engineering work.

OMCO conducted an extensive exploration campaign across the CCZ (Golder Associates, 2013) with a minimum of six campaigns utilising the MV Governor Ray between 1978 and 1981. Work included sampling (Spickerman, 2012), photography and video survey. Footage of some of the exploration work and subsequent pilot mining trials can be found at Periscope Film (2013).

The pilot mining vessel had dynamic positioning, a 33,000 ton displacement and a length of 180 m. It utilized a sophisticated system to deploy the pipe string and electric power conduits (ISA, 2004). Its large moon pool (61×22 m) facilitated the handling of a large collector and buffer. OMCO built a motorized collector outfitted with Archimedes screw-drives to crawl over soft sediment (Figure 5.11).

Initial experiments were at a depth of 1,800 m off California, but the first full tests were south of Hawaii at the end of 1978. These first tests were suspended because the doors of the moon pool refused to open. Finally in February 1979, the operation was carried out with more success. In addition, much data was assembled by the ship's advanced computer system. These operations succeeded in demonstrating that OMCO's basic approach to dredging and lifting worked (ISA, 2004).

Figure 5.11 OMCO Screw-drive collector and pilot mining vessel, the USNS Hughes Glomar Explorer



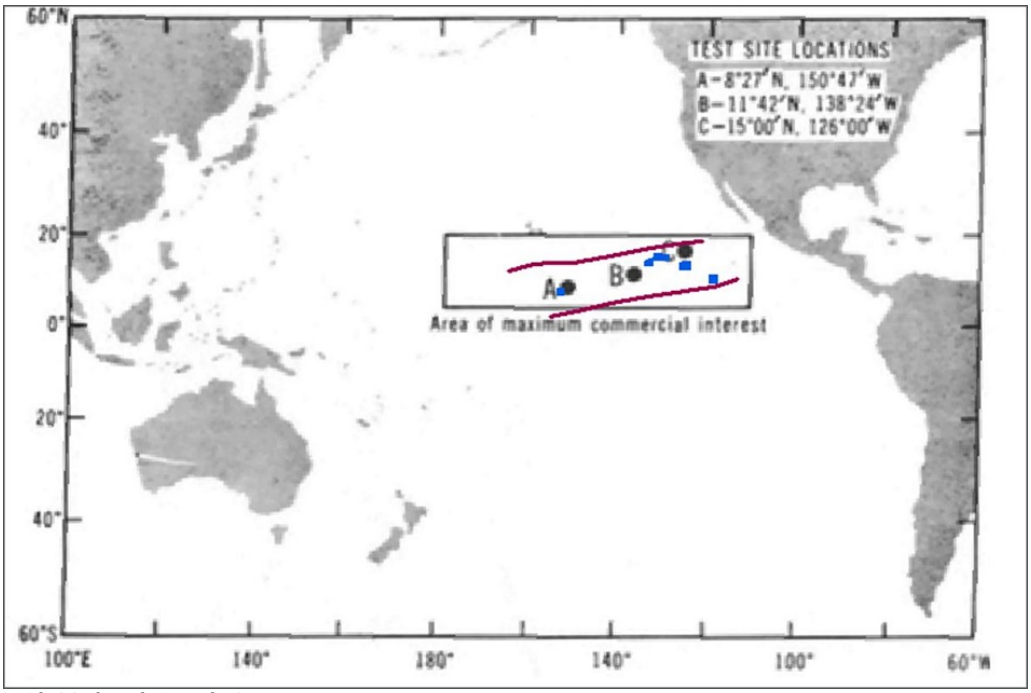


Sources: Spickerman (2012); Strauss (2014)

5.2.8 DOMES

In order to meet requirements of national environmental legislation, the United States in 1975 initiated a comprehensive research programme called Deep Ocean Mining Environmental Study (DOMES; Bischoff and Piper 1979; DOMES, 1981; Thiel et al, 1997). The study was described as a Draft Programmatic Environmental Impact Statement and characterised the environment in the CCZ region (which was included in a rectangular area called also the DOMES area) and the impacts of its potential mining.

Figure 5.12 DOMES baseline sites in the CCZ, within the DOMES area



Modified after Piper et al. 1979 with CCZ boundaries and TOML areas.

Phase I of the programme, called DOMES I, was undertaken by the National Oceanic and Atmospheric Administration (NOAA) of the US Department of Commerce to provide environmental baseline information on three representative mining sites (A, B, C) in the Pacific manganese nodule province. Each covered an area of approximately 200 km by 200 km and was chosen in consultation with industry and the scientific community.

The programme was run by NOAA's Pacific Marine Environmental Laboratory with significant input from academia. Twelve campaigns of NOAA's research vessel RV Oceanographer were carried out from August 1975 through November 1976, totalling approximately 240 ship days at the three sites. Scientific disciplines represented were physical oceanography (studies of solar radiation and ocean currents), biological oceanography (studies of phytoplankton and benthic fauna), chemical oceanography (studies of nutrient chemistry and suspended matter), and marine geology (studies of sediment, nodules, acoustic stratigraphy).

DOMES II involved monitoring of the effects of the OMI and OMA pilot trials described above (e.g., Ozturgut et al, 1981). The OMI and OMA systems required discharge of return water from the lift system, and this was monitored and characterised. Estimates of lift and collector impacts for a 5,000 dry metric tonne per day operation were also made.

Data review and reporting included assessment of required resources for mining and on-shore processing marketing and cost-resource-safety trade-off estimates.

DOMES was designed primarily as a data gathering effort and final data reports were submitted to NOAA by early 1978. Data collected concurrently by other workers was included with the DOMES data for completeness, with a book of key findings and data published in 1979 (Bischoff and Piper 1979). The final official Draft Programmatic Environmental Impact Statement was issued in 1981 (DOMES, 1981; Ozturgut et al, 1997). The conclusions of the study at the time were that for a commercial operation most issues were likely not of serious concern, but with key focus on:

- Surface discharge from a typical riser lift system would have no long term impact and would be very small at the scale of the CCZ. A question remained on impact of particulate matter on fish larvae.
- Impact from a typical seabed collector would be clearly adverse to benthic organisms at the site, but that on the scale of the CCZ impact would not be significant. Recolonisation rates were unknown. High rates of biodiversity and ecosystem function were addressed but not examined in depth and the inevitability of islands of undisturbed seafloor within the mine sites was pointed out.
- Extent and impact of sediment plumes generated at the seafloor was still largely unknown and demanding of further investigation. The benthic impact experiments discussed below were then designed to specifically address this point (Ozturgut et al, 1997).

5.3 1982–1995: The Reciprocating States Regime and the Pioneer Investors

By 1980, the Third United Nations Conference on the Law of the Sea had been running for eight years and a successful outcome was far from certain (Churchill and Lowe, 1988). The process was drawn out by a need for consensus in the sessions as earlier attempts to use majority votes had proven unsatisfactory.

In the early 1980s legislative efforts to manage deep-sea mining (and specifically development of the CCZ nodules) split with:

- The United Nations establishing a specific Preparatory Commission (PrepCom; at the eleventh session) to look at defining principles and regulations to implement the 1982 Act and to encourage Pioneer Investors into the Area (this was often related to trying to get particular states to sign UNCLOS);
- Establishment of the Reciprocating States Regime (RSR). This directly involved USA, Japan, France, West Germany, United Kingdom and by distant association the USSR, China, and what became the IOM consortium. The RSR was either planned as a bridging system until UNCLOS could be sorted out or was an alternative system altogether (Churchill and Lowe, 1988).

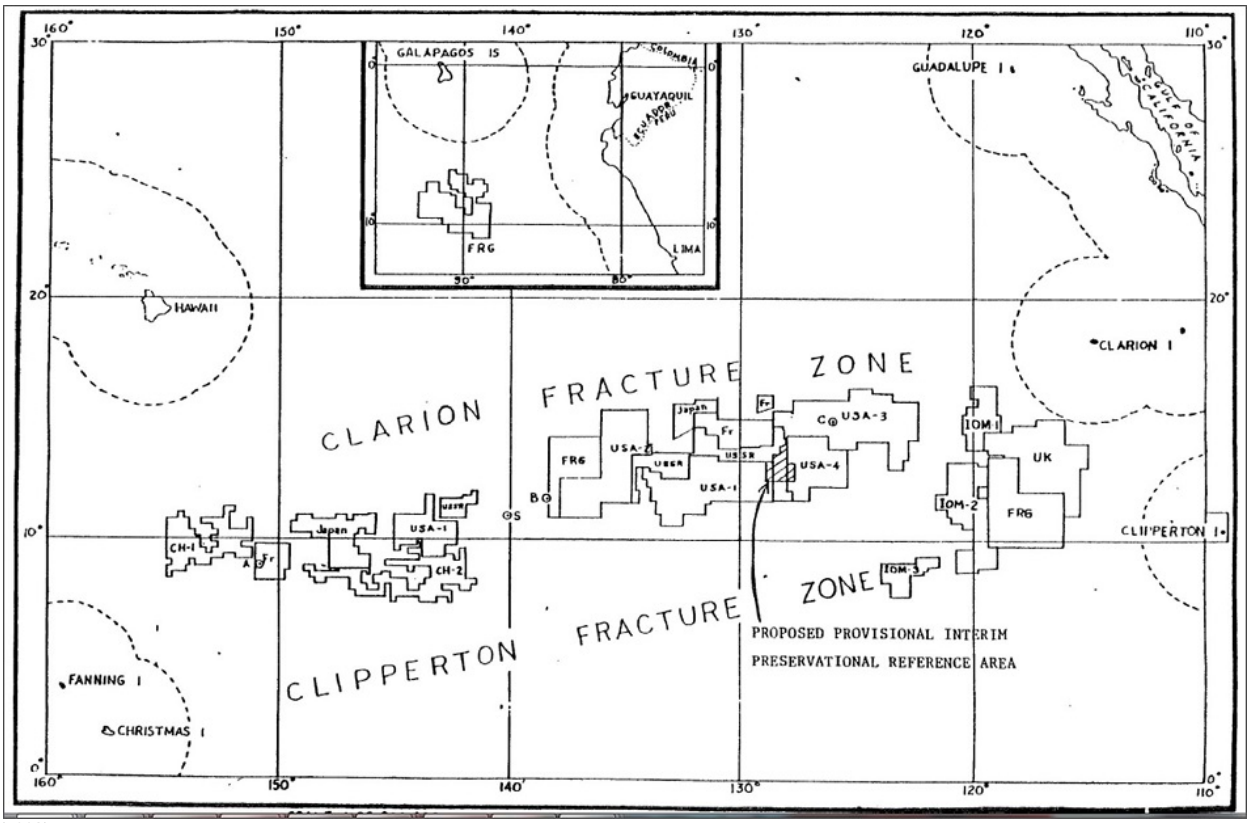
The UN was keen to close out UNCLOS and recognised the need to attract a group of Pioneer Investors on more attractive terms than originally envisaged (Resolution II). Many of the groups that had worked in the Area in the 1970s had the desire to register and protect past work with the hope that UNCLOS was imminent. After several initial attempts to progress discussions, the USSR and India registered first as Pioneer Investors in early 1984. With concerns about losing security of tenure, France and Japan followed suit in late 1984.

Issues with the applications, in part relating to overlapping areas, meant that most of these applications were resubmitted along with others in 1987 and 1988. In the meantime PrepCom worked on regulations, the RSR was progressed further, and the nations concerned discussed the issues at the UN and in other forums.

The RSR worked by mutual co-operation whereby each participating state:

- Established domestic deep mining legislation of a broadly similar basis and
- Met and agreed that mineral rights granted under their respective domestic legislation would not overlap (Figure 5.13).

Figure 5.13 Operating Areas under the Reciprocating States Regime, circa 1993



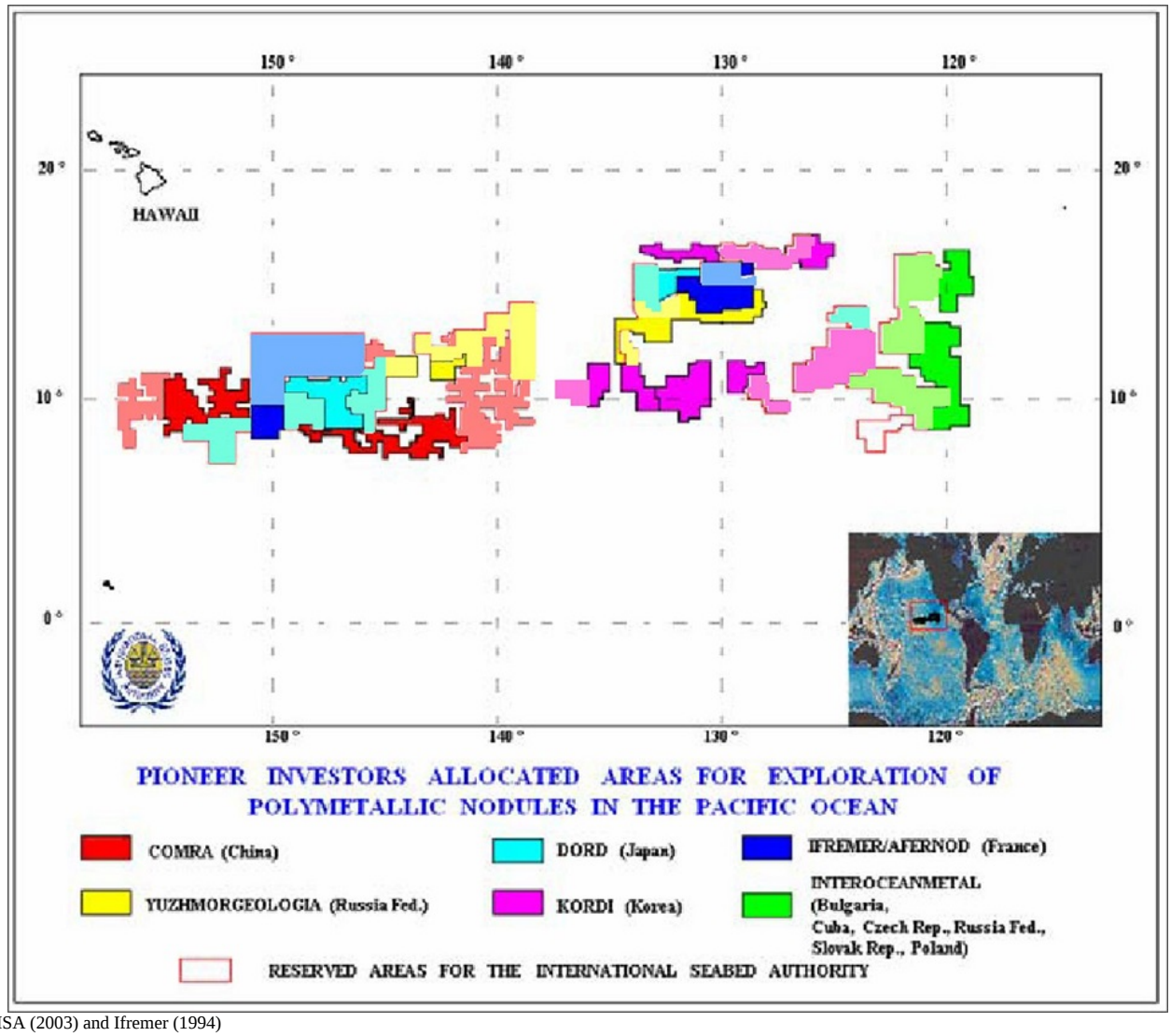
Source: NOAA (1993)

The RSR worked well in terms of removing the issues of the overlapping work programmes (and subsequent claims) that characterised the previous decade. By 1993 there were 18 “operating areas” recognised by the US (Figure 5.13) with all but one in the CCZ Most of these areas are now encompassed within the ISA contracts and returned areas (Figure 3.1). Today only three of these operating areas are still in force outside of UNCLOS, these being the USA-1 (two blocks) and USA-4 areas, all issued to Lockheed Martin under the US Deep Seabed Hard Minerals Act (NOAA, 2016). The deep-sea mining legislation developed by the other members of the Reciprocating States Regime is however still of value as domestic legislation is required in any event by Sponsoring States under UNCLOS.

Between 1989 and 1994 the commercial consortia started shutting down their nodule programmes and the UN Secretary General seriously tackled the idea of modifying Part XI (Ranganathan, 2014). In 1994, revisions to Part XI (at this stage called “The Boat Paper”) had progressed to point of widespread (if not complete) acceptance. The resulting Agreement on Implementation was included into UNCLOS and adopted as a binding international Convention.

Issuance of the Agreement of Implementation lead to a raft of ratifications from UNCLOS signatory states, but despite it being drafted largely in concession to the United States, the United States has not yet ratified UNCLOS, although it did provisionally sign the Agreement of Implementation. By this time the registration of the seven Pioneer Investors was complete. This included the six shown in Figure 5.14 as well as India (with a contract in the Indian Ocean). The Pioneers received special terms including application fees at cost of administration (up to USD 250,000) and the right to apply for 150,000 km^2 in the first instance (returning a 150,000 km^2 area of equal value at that time; Figure 5.14), reducing to their preferred 75,000 km^2 over the next fifteen years.

Figure 5.14 Retained and returned (lighter shade) areas of the pioneer investors in the CCZ



Modified after ISA (2003) and Ifremer (1994)

5.3.1 Deep Ocean Resources Development

DORD has its origins in DOMA (Deep Ocean Minerals Association) a consortium of some 39 different Japanese companies that was formed as a public corporation in 1974 but with oversight by the Japanese Ministry of International Trade and Industry (MITI). DORD was then established in 1982, specifically for the development of polymetallic nodules. However, since the mid-1990s, it has been involved in other deep-sea mineral resource types and hydrocarbon research (DORD, 2013). DORD is 75.83% owned by Japan Oil, Gas and Metals National Corporation with the remainder distributed amongst some 43 commercial companies (DORD, 2013).

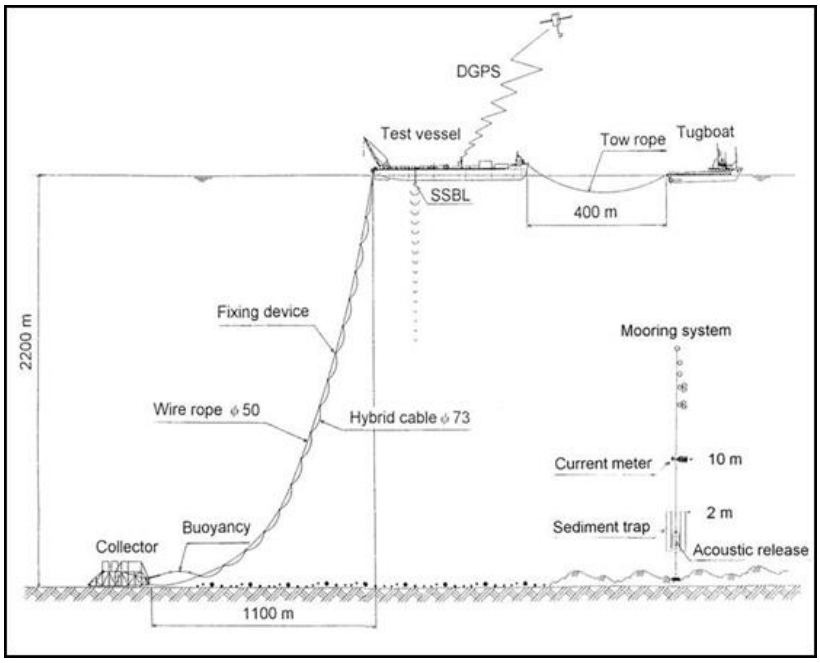
DORD began manganese nodule exploration activities in 1983 and was formally accepted as a Pioneer Investor in late 1987. DORD reports through the Japanese Agency of Industrial Science and Technology to MITI. Between 1981 and 1989 it spent some JPY20 B (~USD80 M at the time; Kajitani, 1990). Much of the research and development expenditure was on a mining system concept, models and simulations and pilot development by the Technology Research Association involving:

- Towed collector based on the OMI Asakawa design but incorporating a crusher;
- Lift system (either pumping or airlift);
- Flexible hose connection to collector that was key for helping managing heave and seafloor irregularities as well as landing and recovery operations; and
- Pumps and compressors and their efficiency.

In 1997, as part of the pilot programme of component testing, a trial was made using a towed collector without crushing or lifting (Figure 5.15). This was on a seamount southeast of Marcus Island (Minami-Tori-shima) at 2200 m and nodules were successfully collected (Yamazaki 2008, Yamazaki, 2011).

Figure 5.15 1997 Japanese collector, barge and trial schematic





Source: Yamazaki (2006)

In 1996, ahead of the seamount trial, DORD paused work in the CCZ, resuming only in 2008.

5.3.2 China and COMRA

Formal Chinese interest in deep-sea marine science and development is believed to date back to the mid-1970s with the leadership of Deng Xiaoping (Takeda Jun'ichi, 2014; Hoagland et al, 1992).

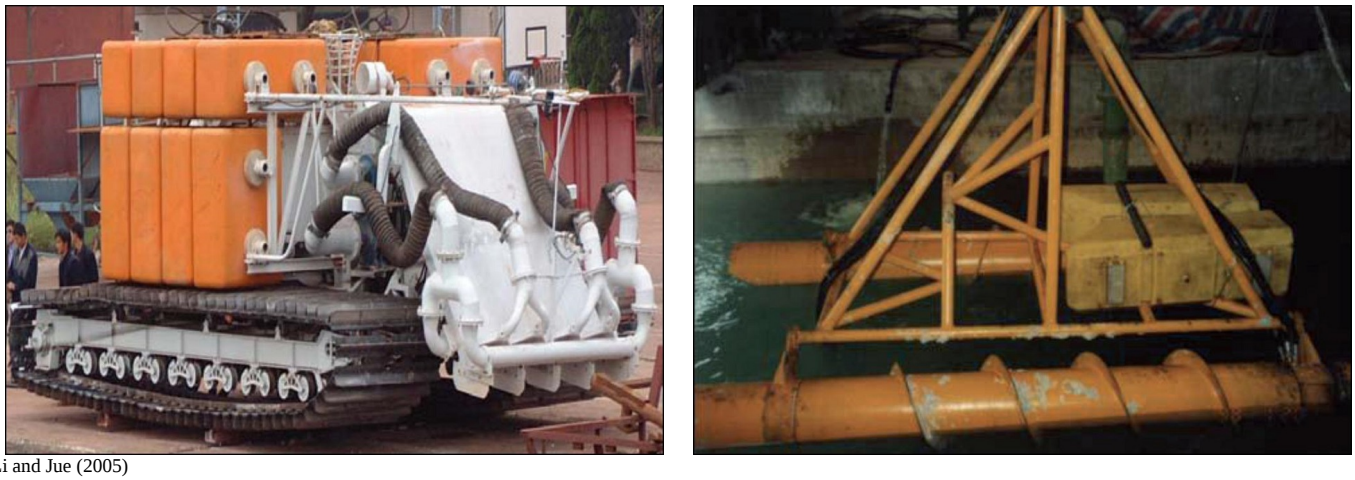
The first known marine surveys took place in 1978 (RV Xiang Yang Hong 05; COMRA, 2013a), 1983 and 1985 (RV Xiang Yang Hong 16 in the central Pacific; Hoagland et al, 1992; Glasby, 1986). Between late 1986 and 1987 a campaign to the CCZ covered 48,000 km^2.

Between 1991 and 2013, COMRA organized some 16 ocean expeditions to its area in the CCZ (COMRA, 2013b). Ultimately it delineated some 20 Gt of "mineral rich areas" (COMRA, 2013a), using in part an acoustic system called MFES (Multi-Frequency Exploration System; ISA, 2010).

In 2001, COMRA was involved with research institutes in pilot-miner trials in a test pool (2.8 m deep) and later in shallow water (~150 m deep; Li and Jue, 2005; COMRA 2013c). The tests included: trials of track and screw drive vehicles (Figure 5.16); determination of power requirements; ability to navigate obstacles; spud types for tracks; the ability to make turns; and the effect of sideloads. Tendency to accumulate mud is not specifically mentioned. Test work showed that the test tracked vehicle worked better than the test screw drive vehicle (Li and Jue, 2005) so a tracked vehicle was used as basis for the pilot vehicle.

Trials started June 2001 and in September the first successful production test were achieved with collection of 900 kilograms of synthetic nodules. At around the same time lifting tests were done using pumps and pipes in an old mine shaft (to 230 m).

Figure 5.16 Chinese pilot scale tracked and test screw-drive subsea vehicles



Source: Li and Jue (2005)

5.3.3 GEMONOD

AFERNOD continued working on the CCZ project for the French government until around 1984 when they were joined by GEMONOD (Groupement pour la mise au point des MOyens nécessaires à l'exploitation des NOdules), which focused on the mining and processing sides of the project (Ifremer, 1994).

Work at this time included provision of samples for metallurgical test work, more detailed seabed geotechnical work and accurate characterisation of the types of seabed obstacles. The geotechnical work included using the Nautile submersible to take shear vane readings on carefully selected sites during the 1988 NIXONAUT campaign (Cochonat et al., 1992).

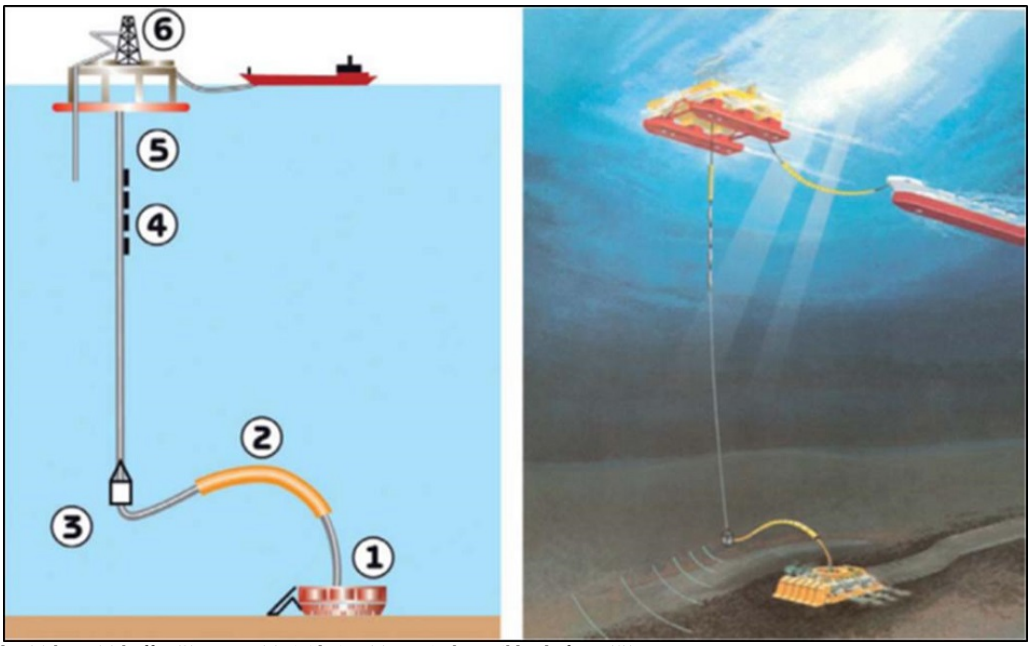
Much of the photographic and video data collected by Ifremer at this time was studied by biologists and is encapsulated in a detailed study on the megafauna (animals > 2 cm in size) of NIXO45 by Tilot (2006). This includes some of the first detailed photos of animals and landforms on the seafloor of the CCZ and a quantitative analysis of the megafauna present.

A 25 tonne metallurgical sample was collected from 49 dredge deployments. A trial mining site was also selected, called NIXO 45, and this area was surveyed and sampled in detail.

AFERNOD and then GEMONOD also considered a variety of possible mining systems during this period including one of the most exotic ever taken to testing phase. Initially in the 1970's the continuous line bucket system was favoured (ISA, 2001b) but by the mid-late 1970s survey had discovered terrain obstacles on the ocean floor, such as blocks, steps, cliffs and potholes, convincing French engineers that a bottom collector independent of a surface vessel was needed.

In 1980 they worked on the concept of a free-shuttle mining system (Ifremer, 1994) consisting of a series of independent vehicles that would dive on their own to the ocean floor. Reaching the bottom, they would dump ballast to position themselves and would start to collect the nodules. After loading 250 t of nodules, they would drop additional ballast and start their ascent to the surface. It was found during the feasibility study that the system would be too expensive, because the 1,200 t weight of the shuttles far exceeded their 250 t loading capacity. Nonetheless in 1985 a prototype pilot scaled vehicle (PLA-2 6000; Préleveur Libre Autonome) was built and in late 1987 tested in the Mediterranean where it demonstrated flight, landing, seafloor movement, and return to surface (ISA, 2001b).

Figure 5.17 GEMONOD crawler and hydraulic lift system



Source: Herrouin 2009. (Crawler (1) hose (2) buffer (3) pumps (4) rigid pipe (5), semisubmersible platform (6))

By the mid-1980s GEMONOD determined that hydraulic systems seemed to have the greatest potential (Ifremer 1994; Herrouin 2009; ISA 2001b, 2004). GEMONOD's system (Figure 5.17) consisted of: a semi-submersible surface platform; a 4,800 m rigid steel pipe string, and a flexible hose, 600 m long and with a 38 cm internal diameter, connecting the bottom of the pipe string to a dredge on the seabed. This hose would form an arc, allowing the dredge to deviate from the route followed by the surface platform so as to avoid obstacles. The self-propelled dredge would be 18 m long, 15 m wide and 5 m high, weighing 330 t for 78 t buoyancy. Crawling on the bottom, it would collect nodules and condition them for pumping through the flexible hose. Ore carriers would transport the nodules from mining ship to port, where the processing plant would be located.

GEMONOD also looked at mineral processing, both hydrometallurgical and pyrometallurgical options (Ifremer, 1994). This included a pilot processing plant for ammonia/acid leach circuits built in Fontenay-aux-Roses by CEA (ISA, 2001b), and smelting tests by MetalEurop.

5.3.4 USSR and Russia

Studies by the USSR Academy of Sciences increased markedly in number in the 1980s. New advances were in the study of the composition and structure of nodules, as well as local factors (e.g., Kazmin, 1984; Andreev, 1994). However, the most extensive research was carried out by the Ministry of Geology (through institutes such as Yuzhmorgeologiya) of the USSR. These studies included the Indian Ocean, but focused for the most part on the CCZ, and each year between 1982 and 1987 there were four or five marine expeditions (S. Andreev pers comm. 2016). Work included development of high-quality towed sonar and photo platforms (e.g., MAK, MIR and Neptune that are still used today), as well as samplers and navigation systems.

During the 1980s and early 1990s the Soviet explorers examined of the order of 3 million km^2 area in the CCZ, with a network of stations at an average density of ~ 50×50 km. Studies included bathymetric, gravimetric and magnetometric observations, acoustic research, as well as bottom sampling. On the sections of the CCZ regarded as promising for the future development application, the station spacing was reduced to 25×25 km, and towed sonar and video-photography was added.

On May 16, 1988 the USSR formally became a Pioneer Investor through Yuzhmorgeologiya, and since then the Ministry of Geology effectively halted all nodule related work outside the CCZ. Up until 1997, YMG performed around 12,000 line km of deep-towed acoustic survey (typically side-scan and sub-bottom profiling) and 8,900 line-km of deep towed photo-television survey and collected about 1100 seafloor samples. The results of this work greatly clarified ideas about the structure of localized accumulations of the nodules.

In parallel with this work the Russians considerably intensified research and development into the extraction and processing of nodules. This included pilot testing of both pyrometallurgical and hydrometallurgical processing in 1989.

During 1988 and 1989 Yuzhmorgeologiya and Sevmorgeologiya also were closely involved in geological studies of the eastern part of the CCZ in order to prepare the applications created before the Interoceanmetal Joint Organization. This included results from some 11 research campaigns.

5.3.5 Interoceanmetal Joint Organisation

Interoceanmetal Joint Organization (IOM) was formed on 27 April 1987, based on an Intergovernmental Agreement and started operations in December that year (Kotlinski et al, 2008). In early 1991 IOM registered as a Pioneer Investor with PrepCom with their Certificate of Registration issued in July 1992. Present IOM member states are: Bulgaria, Cuba, Czech Republic, Poland, Russian Federation, and Slovakia. Past members included Vietnam and East Germany.

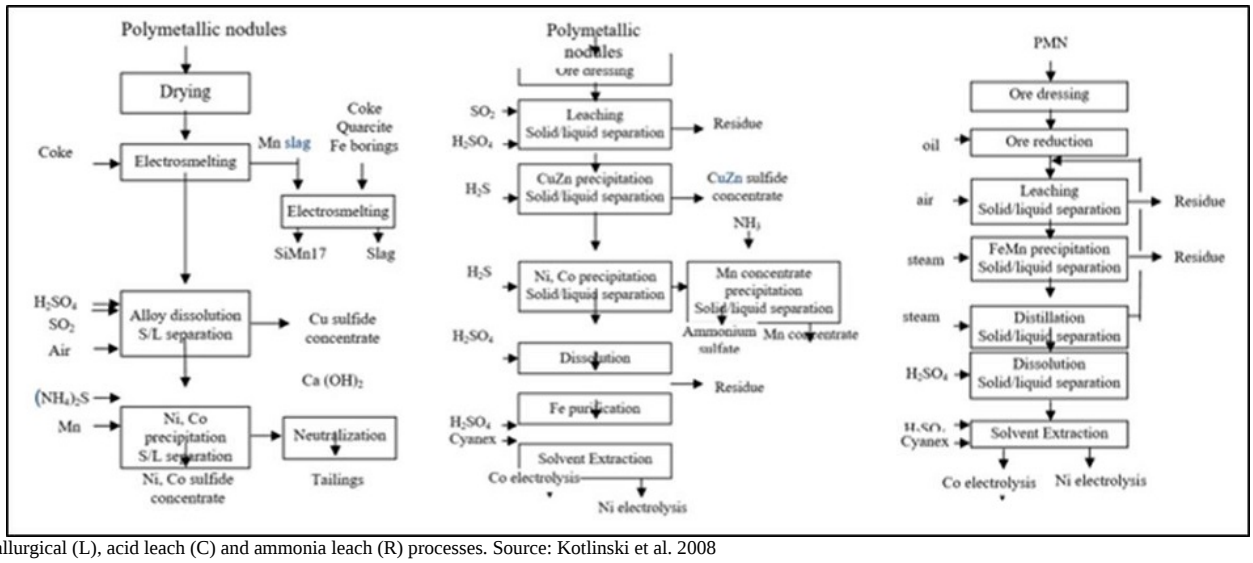
After its establishment, the IOM focused on regional geological and geophysical surveys within the CCZ in 1988 and 1989. After surveying 540,000 km^2 (including TOML Area E), IOM's claim with PrepCom concerned 300,000 km^2, all in the eastern part of the CCZ. Between 1987 and 2010 they were involved in some 20 research campaigns (Stoyanova, 2010).

In the mid to late 90s IOM started research into mining and minerals processing. Concept design of a possible mining system included computer simulations of the effects of the marine environment on the mining system, movement of the mining vessel and nodule miner and effects of the movement on the transport rise pipe length paid out, and riser pipe deformation. The simulation showed that the riser pipe shape deformation depends mainly on mining vessel movement speed and can be controlled by horizontal forces applied at low speeds.

Experiments were also done for nodules of different shapes and sizes for nodule and water velocity measurements at upward flow in the hydraulic laboratory at in the Department of Water Engineering and Hydrotransport of the Agricultural University of Wroclaw, Poland. The mixture phase velocity measurements were carried out with application of radioisotope-tagged natural and synthetic nodules. A volume concentration as high as 10% was used in a pipeline of 150 mm diameter, that could be considered for a trial or commercial system.

Metallurgical research included desktop development of a pyro-hydrometallurgical processing circuit at the University of Chemical Technology and Metallurgy, Sofia, Bulgaria and Hutny projekt, Bratislava, Slovakia (Figure 5.18).

Figure 5.18 Preliminary metallurgical processes studied by IOM



Pyro-hydrometallurgical (L), acid leach (C) and ammonia leach (R) processes. Source: Kotlinski et al. 2008

Hydrometallurgical acid leach nodule processing was also studied at CNIGRI Moscow, Russia, including benchtop test-work and hydrometallurgical acid and ammonia leach processing options at the Nickel Research Centre in Moa, Cuba. All of the process route options studied gave good metal recoveries but there were clear (unpublished) differences in terms of likely capital and operating costs.

5.3.6 Benthic Impact Experiments

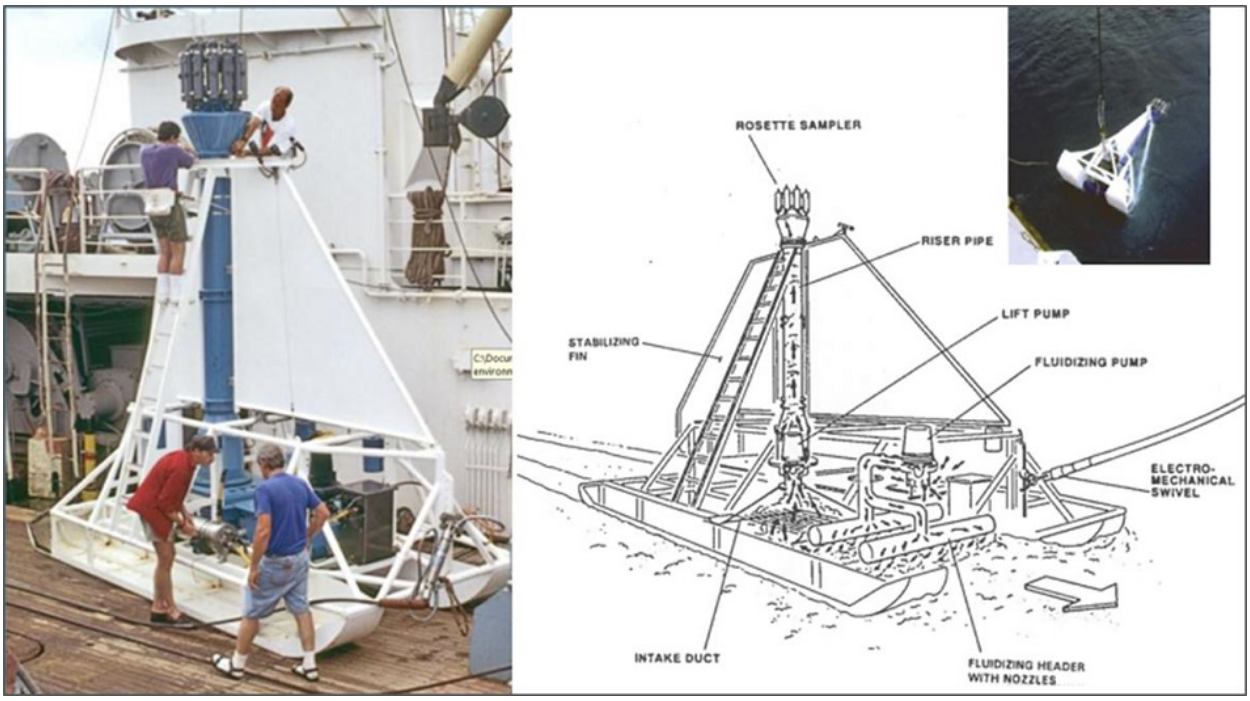
Benthic impact experiments were born out of US environmental studies in the 1970s, including DOMES. The first known disturber system was built in the late 1970s by Sound Ocean Systems Inc (Brockett 2016, pers comm.).

After several attempts by different groups to build an effective disturber and monitoring system, Sound Ocean Systems designed and built a disturber system, the second generation DSSRS-II (Figure 5.19) to lift and then suspend sediments at 5 to 10 m above the seafloor using two 7.6 hp pumps. Testing in early 1993 was followed with a cruise to the CCZ (BIE-II) with YMG, including baseline survey, recovery of the previous year's sediment traps and a programme of 49 tows. This time the disturber worked "well" and sediment was dispersed. Key conclusions from the trial (Ozturgut et al, 1997) were positive, i.e.:

- Sediment dispersed as a turbidity flow rather than as a low density plume - initial estimates of the far field range of dispersion may have been overestimated;
- Burial of up to 1–2 cm thick appeared not to have the catastrophic effect that was once predicted as both meio- and macrofauna appeared to burrow or recruit to the deep-sea benthos if needed;
- Some questions would remain until a full scale mining test is monitored.

The impact assessment of the site, when revisited after 9 months, indicated that, while some of the meiobenthos showed a decrease in abundance, the macrobenthos showed an increase in their numbers, probably because of increased food availability (Yamazaki, 2011). The site was then revisited again in 2000 by YMG and the key finding was that "Decreasing of macrofauna is observed on physical disturbed areas (on disturber tracks) but not on the areas of re-sedimentation" (Melnik and Lygina, 2010). Note that with a commercial mining system, that sediment from mined areas will be progressively redeposited alongside or immediately behind the collector or concentrator.

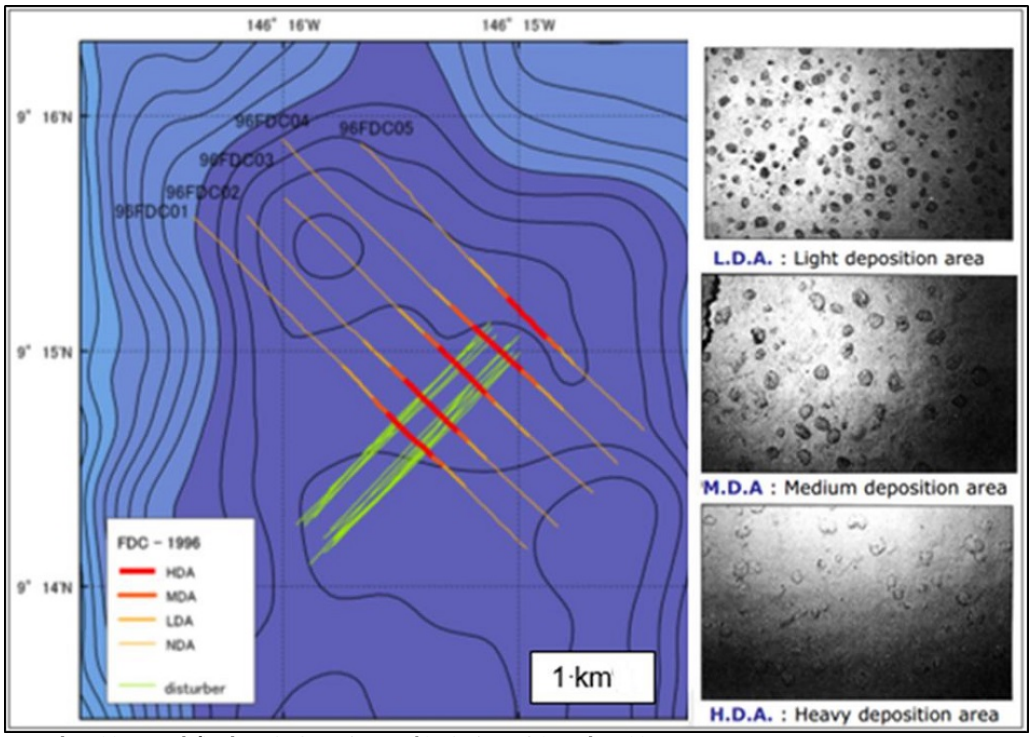
Figure 5.19 DSSRS-II Benthic Disturber



Modified from: Stoyanova (2010), Brockett (1994)

Subsequently the DSSRS-II “benthic disturber” was used by several other groups. One of the best reported experiments was JET (e.g. Yamazaki et al 1997; Yamazaki and Kajitani, 1999; Yamazaki, 2011). This study included baseline data collection, sediment traps, current meters etc, but the Japanese also developed a quantitative photographic analysis method to try and more intensively measure distance of sediment redeposition from the disturbance tracks (Figure 5.20).

Figure 5.20 Review of the DORD 1994 JET Benthic disturber site in 1996 using a Finder-installed Deep-sea camera



Source: DORD (2010, 2014). Heavy deposition was defined as >0.26 mm (Yamazaki, 2011). NDA is no deposition.

Post-experiment observations took place just after the experiment (J2 survey), about 1 year later (J3), and about 2 years later (J4), by which stage DORD's main conclusion was that any impact had been significantly reduced. The observations centred around sediment sampling and camera surveys to determine resedimentation impact on the benthos.

Attempts were made to scale up the JET results to full commercial scale, but these were dependent on a number of fundamental assumptions including penetration depth (Yamazaki, 2011).

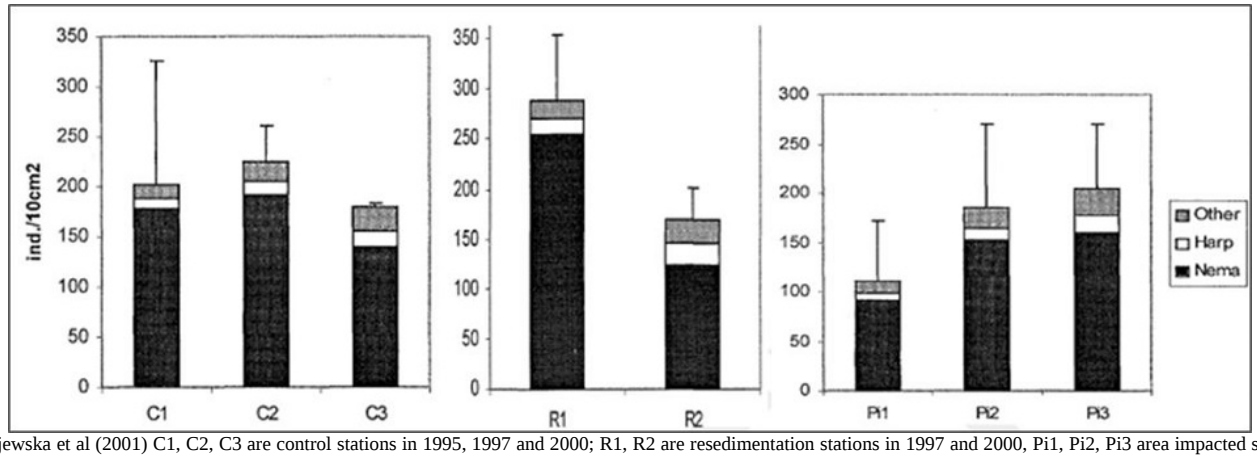
Radziejewska et al (2001) summarised three surveys at the IOM BIE site, namely those of 1995 (immediately pre and post disturbance), 1997 and in 2000. Research on the IOM site essentially:

- Struggled in 1995 to find significant impact to the meiobenthic communities outside of the tracks left by the DSSRS-II;
- Found in 1997 widespread changes (e.g., in nematode familial make-up) as a result of a phytodetritus sedimentation event (likely a natural plankton bloom event) as well as that the tracks were now substantially "levelled off", presumably due to action of currents or bioturbation;
- Found in 2000 that response to the phytodetritus sedimentation event was more or less reversed to the condition at the start of the trial.

Radziejewska et al (2001) interpreted that the implications of this are that:

- Certain significant processes take place in the abyssal communities without human intervention;
- This supports the notion of there being no absolute, inherent stability on the abyssal seafloor;
- These natural processes can induce changes of greater magnitude than induced by the benthic impact experiments (and by extension potentially by commercial production)
- That quantitative monitoring of mining impacts will be challenged by the naturally occurring variations.

Figure 5.21 IOM BIE meiobethos populations for control, resedimentation and impacted area stations



Source: Radziejewska et al (2001) C1, C2, C3 are control stations in 1995, 1997 and 2000; R1, R2 are resedimentation stations in 1997 and 2000, Pi1, Pi2, Pi3 area impacted stations in 1995, 1997 and 2000. Nema is Phylum Nematoda (round worms), harp is Harpacticoida (copepod crustacean)

Kim et al, (2011) looked at sinking particle flux relationships with ENSO and found up to three-fold increase against background during a moderate La Nina event in 2007/08. Significantly with regards to the IOM experiences regarding their BIE site, the winter of 1995 was also a moderate La Nina event (1996 was neutral and 1997 a 'super' el Nino; NOAA NWS, 2016).

5.4 1996 onwards: The International Seabed Authority

With entry into force of UNCLOS in 1994, the ISA technically came into existence. In actuality, the ISA started working as an autonomous international organisation, domiciled in Kingston Jamaica, two years later in June 1996. All signatories of UNCLOS are members of the ISA which operates as mandated by UNCLOS.

5.4.1 Korean Research Groups

Korean Ocean Research and Development Institute (KORDI) was established in 1973, with a broad mandate for Korean interests in marine science and engineering.

Work on CCZ nodules began as early as 1983 with three campaigns to the western CCZ in what was called the KODOS Area (Korea Deep Ocean Study; Jeong et al., 1994; Jung et al., 1997). This was followed up with two in 1989/90 in collaboration with the University of Hawaii (Kang, 2008). A combination of samples, bathymetry and seismic data was collected.

Between 1995 and 2002, KORDI focused on exploring their contract area defining mineral inventory of some 510 Mt (Kang, 2008) and environmental baseline data collection (KIOST, 2014). Exploration, environment and mine development programmes were consolidated under one government ministry.

Since 2002 their focus on environmental studies has increased, including research into a Priority Mining Area and preparations for a benthic impact experiment (KIOST, 2014). This has included detailed towed sonar surveys and sampling.

KORDI became KIOST (Korean Institute of Ocean Science and Technology) in mid-2012 and in recent times development of their advanced mining concept has been managed by KRISO (Korea Research Institute of Ships & Ocean Engineering). The concept involves a track driver collector with colander electro-hydraulic heads feeding a sub-sea buffer with inline pumps delivering to a surface vessel. As of 2015, all of the sub-sea components had been built at a pilot scale and tested in relatively shallow waters.

Lab (pool) scale testing was conducted between 2002 and 2010, as well as shallow water tests in 2009 and 2010 with a first generation device (MineRo-I). Collector efficiencies as high as 95% were achieved when the collector head was manually adjusted in terms of height above the seafloor.

Sea trials with the second generation MineRo-II were conducted in 2012 and 2013, with shallow water tracking tests (130 m) followed by a simpler deep water test (1370 m). The shallow water test included collection and subsea crushing of seeded nodules (KIOST, 2014). Sea-trials of the buffer and lift system were completed in late 2015.

5.4.2 The new developed nation contractors

In July 2006, Germany (through its geological survey Bundesanstalt für Geowissenschaften und Rohstoffe or Federal Institute for Geosciences and Natural Resources of Germany (BGR)), received an exploration contract in the CCZ. This was the first contract under UNCLOS not to have been granted to a Pioneer Investor.

Sponsored by Germany as a developed nation, the BGR claimed patrimonial links and supplied historical data of the OMI German license area to define approximately 150,000 km^2 of seabed with half entering the ISA reserved areas and half falling under their contract.

Since then, the BGR has been an active explorer and developer with numerous publications, including an informal mineral resource estimate (Ruhlemann et al, 2011; Kuhn et al, 2011 and Kuhn et al, 2012). These include modern and well document reestablishment of many of the basic relationships found in the CCZ and significant contributions to current geological understanding. BGR also commissioned preliminary work on mining and processing technology. The BGR is a partner within the JPI Oceans - Ecological Aspects of Deep-Sea Mining project.

In early 2013, UK Seabed Resources Ltd started an exploration contract in the eastern CCZ. The previous year they submitted an application, sponsored by the United Kingdom, based on the former KCON Frigate Bird area in Figure 5.4). The resultant UK 1 area was 58,000 km^2 and the equivalent returned area was promptly acquired by partner Ocean Minerals Singapore.

Field work to date by UK Seabed seems to have focused on benthic biological baseline studies, specifically two campaigns in 2013 and 2015 (AB01 and AB02) that supported the Abyssline Project (http://abyssline.info/). The project is being conducted by a consortium of seven non-profit academic research institutes (University of Hawaii, USA; Hawaii Pacific University, USA; Natural History Museum, UK; Uni Research, Norway; National Oceanography Centre, UK; Senckenberg Institute, Germany; IRIS, Norway).

In March 2016, UK Seabed signed a second exploration contract (UK2), this time for an area in the central CCZ (based on former USA-2 area held for OMI. The retained and returned areas are each about 75,000 km^2.

Global Sea Mineral Resources (GSR), formerly G-TEC Sea Mineral Resources, also started an exploration contract in early 2013. GSR is owned by dredging company DEME and sponsored by the Belgian government. GSR successfully claimed patrimonial links to Union Miniere, the Belgian member in the OMA consortium, and retained and returned areas are each about 75,000 km^2 that correspond to the former USA-3 license area. The equivalent returned area was promptly acquired by partner Cook Island Investment Corporation.

Since 2013 GSR has mounted at least one campaign of their own (GSR, 2014) with box-coring and MBES. GSR may also have participated in a JPI Oceans campaign to the CCZ in 2014 (see below).

GSR worked on nodule mining technology with IHC Merwede forming for some time a group called OceanFlore. More recently both IHC and DEME have joined the “Blue Nodule” initiative along with a wide range of other European companies and research institutions.

5.4.3 The new developing sponsored nation contractors

Nauru Ocean Resource Inc (NORI) started their exploration contract with the ISA in July 2011. The stakeholders in the company are Nauruan and domiciled in Nauru. These are the Nauru Education and Training Foundation and the Nauru Health and Environment Foundation (ISBA/17/C/9; ISA, 2011). NORI conducted a campaign to the CCZ in 2013 that included seafloor mapping and sampling.

Tonga Offshore Mining Limited (TOML) started its exploration contract with the ISA in January 2012. TOML is domiciled in Tonga. TOML was 100% owned by Nautilus Minerals Inc. which until 2016 had supported TOML in terms of managing two campaigns to the CCZ, environmental baseline data collection, mineral resource estimation (the main subject of this report) and mining and processing concept studies. In 2020, DeepGreen acquired TOML.

Marawa Research and Exploration Ltd started their exploration contract with the ISA in January 2015. Marawa’s proposed scientific research and exploration programme will involve seafloor mapping, polymetallic nodule sampling as well as environmental baseline studies and environmental impact assessments in international waters (Marawa, 2012).

Ocean Mineral Singapore Pte Ltd (OMS) started their exploration contract with the ISA in January 2015. OMS is a Singapore-incorporated company majority owned by Keppel Corporation, with minority shareholders being UK Seabed Resources Ltd and Singapore-based private investment company Lion City Capital Partners Pte. Ltd., (Keppel, 2015a). Keppel is, amongst other things, a shipbuilding company, and OMS is sponsored by Singapore which was classified by the UN in 2014 as a developing nation (United Nations, 2014).

OMS has collaborated with UK Seabed regarding the second of the Abyssline campaigns (AB02; above).

In late 2013 the Cook Islands Investment Corporation (CIIC), sponsored by the Cook Islands applied for a nodule exploration contract in the reserved areas which was duly approved the following year (ISBA/20/LTC/3, ISBA/20/C/18, ISBA/20/C/29). CIIC have a formal arrangement with GSR regarding the area.

In late 2014 China Minmetals Corporation, sponsored by China, applied for a nodule exploration contract of about 73,000 km^2 in the reserved areas. This was duly approved the following year (ISBA/21/LTC/5, ISBA/21C/L.3).

6 Geological Setting and Mineralisation

6.1 Global distribution of nodules

Seafloor polymetallic nodules occur in all oceans, and the CCZ hosts a relatively high abundance of nodules. Other relatively dense zones are found in the Peru Basin in the southeast Pacific, the centre of the north Indian Ocean, and the Cook Islands. The CCZ also has the highest overall metal grades (Table 6.1).

Table 6.1 Summary of Global Nodule Grades

Element	All Pacific Ocean	Pacific Ocean outside CCZ	CCZ	Atlantic Ocean	Indian Ocean
Mn wt%	20.1	18.8	26.3	13.3	15.3
Fe wt%	11.4	12.8	6.6	17.0	14.2
Ni wt%	0.76	0.63	1.20	0.32	0.43
Cu wt%	0.54	0.41	0.98	0.13	0.25
Co wt%	0.27	0.29	0.20	0.27	0.21

Source: McKelvey et al., 1983.

Key features of the geological setting are described in this section. Further details are presented in AMC (2016).

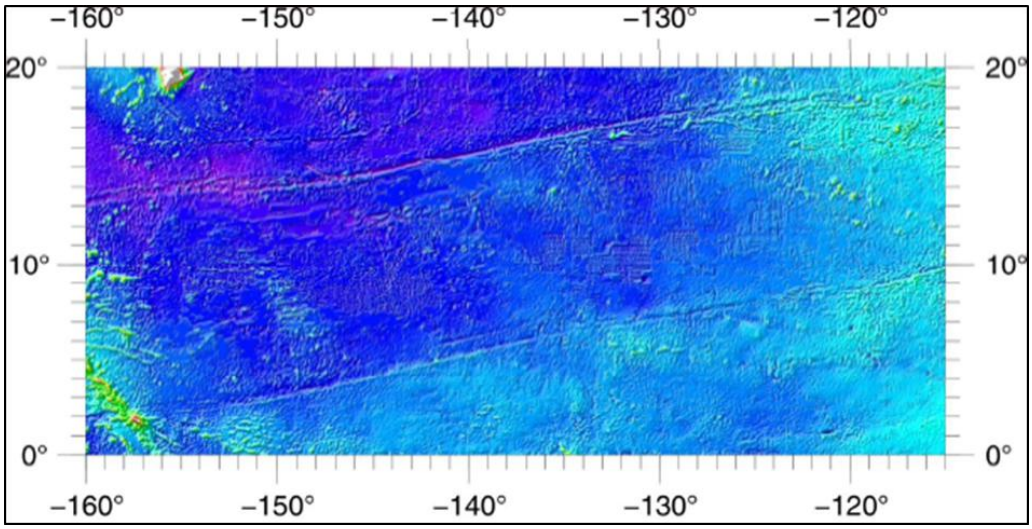
6.2 Tectonic setting and topographic features

The CCZ is defined by two major west-south-west and east-north-east trending transform fracture zones; the Clipperton Fracture Zone to the south and the Clarion Fracture Zone to the north. These fractures zones can be seen clearly on most bathymetric maps (e.g., Figure 6.1). The eastern and western limits are defined by the Mathematicians Seamounts in the east, and the Line Islands rise in the west. The CCZ seabed deepens progressively from about ~4,200 m at 115°W to ~4,800 m at 128°W, then varies between ~4,800 m and ~5,500 m until 161° W.

The CCZ seabed comprises “Abyssal Plains”, which are the largest physiographic province on Earth, covering some 70% of the area of ocean basins and 30% of the Earth’s surface (ISA 2004). Within the abyssal plains province are sub-parallel basaltic lava ridges called abyssal hills, believed to have formed from graben-horst type faulting as a consequence of seafloor spreading. Strike of abyssal hills in the CCZ is north-north-west to south-south-east (locally ±20˚; Figure 6.3), and they typically have an amplitude of 50–300 m (maximum 1,000 m; Hoffert 2008) and a wavelength of 1 to 10 km. The abyssal hills are punctuated by typically extinct volcanic knolls and seamounts rising 50 to 4,000 m above the seafloor. Almost all of the abyssal hills, and some of the volcanic knolls are buried beneath sediment (often up to 150 m thick).

The surficial portion of the sediment cover has a relationship with nodule quality, and it varies regionally, i.e. from predominantly carbonate and siliceous oozes in the south-eastern extreme corner, to mixed clay-ooze in the centre, to predominantly siliceous red clay in the north.

Figure 6.1 Bathymetric map of the Clarion-Clipperton Fracture Zone



Source: ISA 2010.

Figure 6.2 Formation of abyssal hills at mid-oceanic ridges

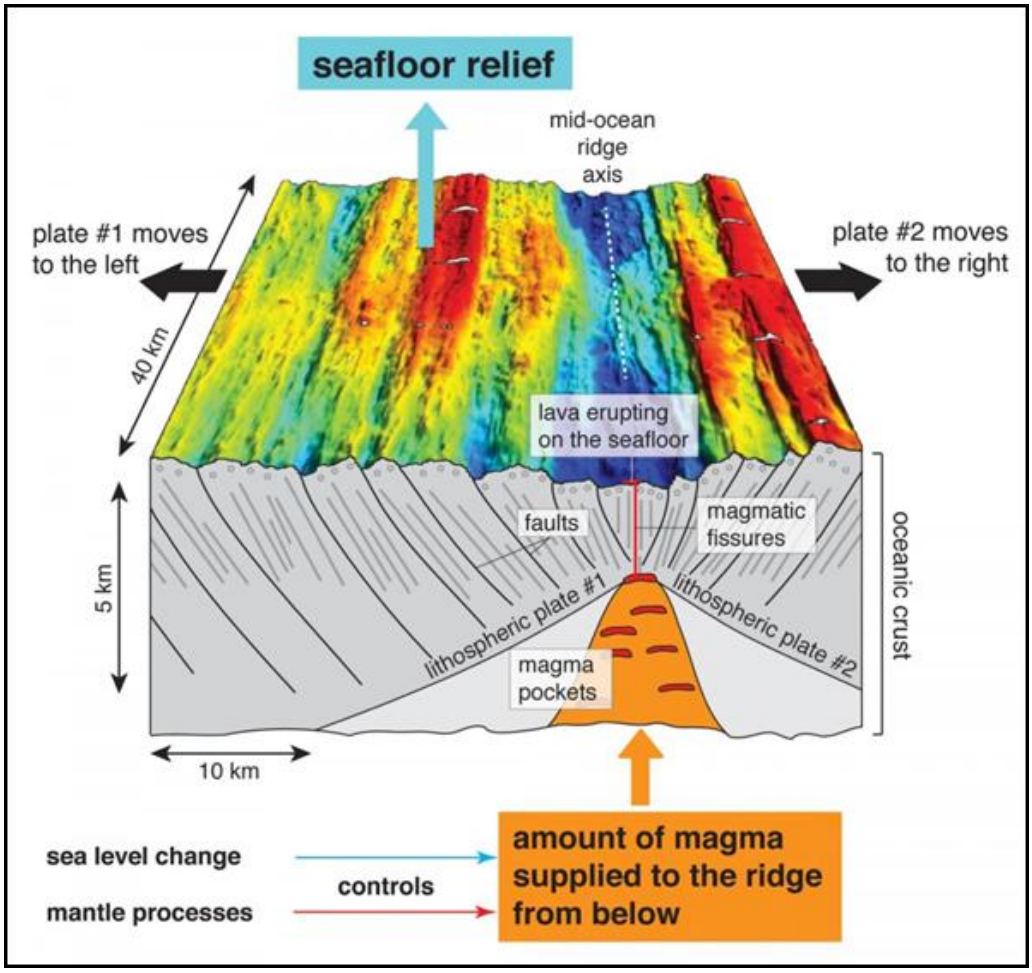
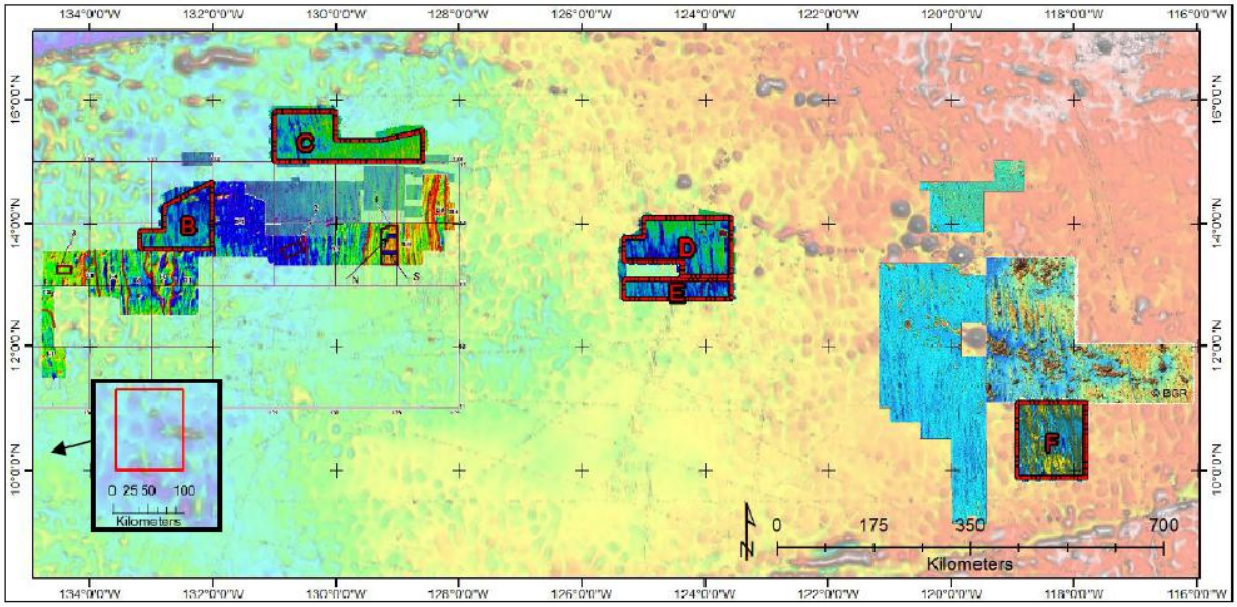


Figure 6.3 Semi-detailed bathymetry for the part of the TOML tenement area



Also some of the areas of Yuzhmorgeologiya (Melnik and Lygina, 2010), Ifremer (Fouquet et al, 2014), IOM and BGR (Knodt, 2012), (ISA, 2010) background is a Smith & Sandwell Product (ISA, 2010). Inset of TOML Area A, with location to the west

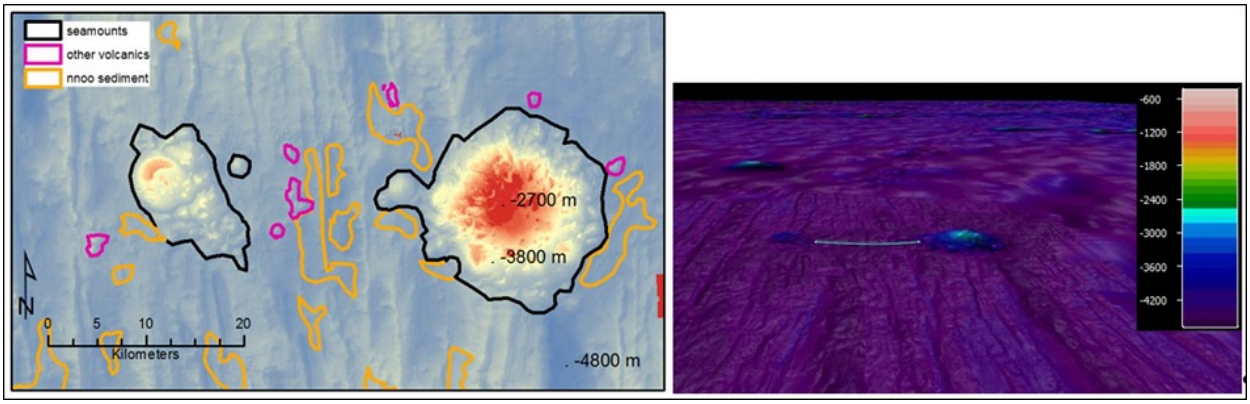
6.2.1 Seamounts, knolls, and other volcanic features

Seamounts can occur in chains (related to hotspot traces or tectonic features) or in isolation (more likely due to increased local heat flow associated with tectonic related thinning or fractures).

MBES mapping of TOML areas B-F confirmed that there are no chains of seamounts within the TOML tenement area, that isolated seamounts and cones are approximately 1.5% of the TOML tenement area, and that exposed basalt (typically sheet flows) makes up an additional 1.3%. While no MBES has yet been conducted in Area A, the Smith and Sandwell bathymetry indicates the likelihood only minor amounts of smaller seamounts in the area
(Figure 6.3).

The highest single seamount (and the only one visible in the GEBCO dataset) is the ~1,000 m seamount in TOML Area D informally named “Mt Mo” (Figure 6.4).

Figure 6.4 Seamounts in TOML Area D

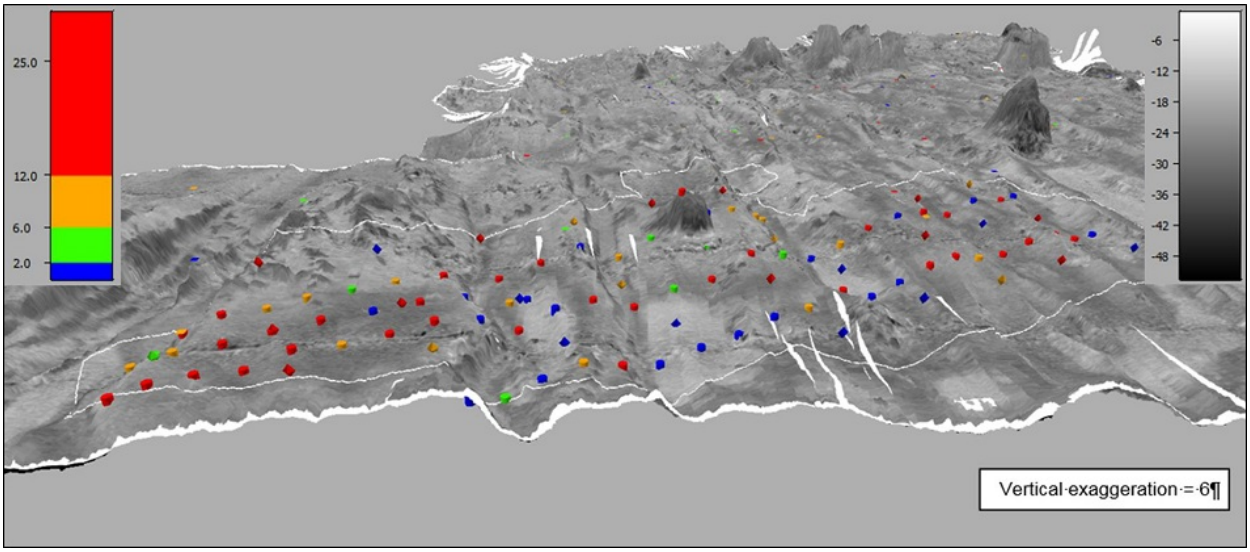


In addition to the seamounts there is evidence for other small amounts of volcanic rocks. These are typically associated with the faults amongst the abyssal hills, which likely reactivate with ongoing movement of the tectonic plate. These are typically flows in the floor of valleys or near the end of valleys.

6.2.2 Sediment drifts

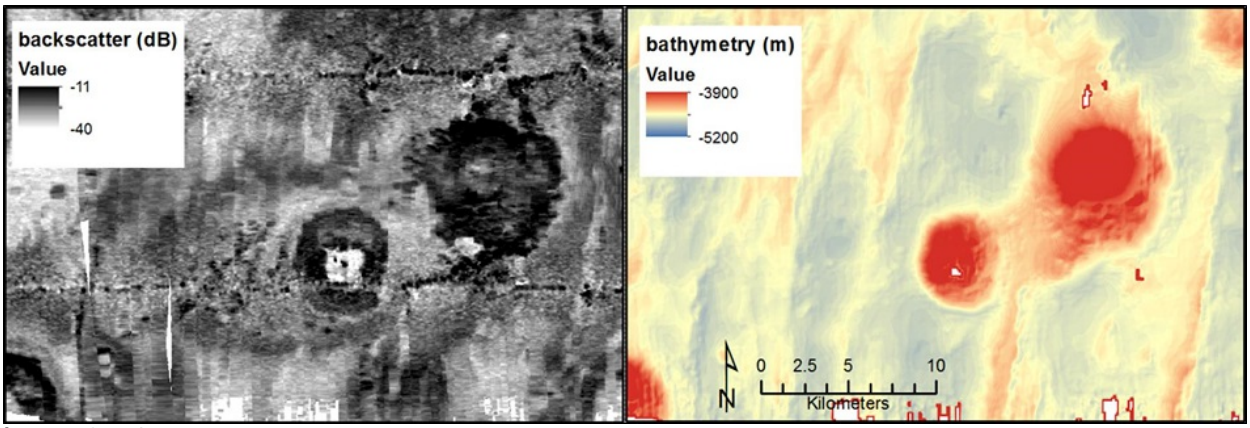
Approximately 7.4 % of TOML Areas B - F are thought to be covered by large sediment drifts (coded as Nnoo below). These can be mapped from MBES, as they are normally softer and ponded in depressions (Figure 6.5). There is also evidence for significant sediment movement elsewhere around seamounts (Figure 6.6) and at the base of steeper slopes. Without detailed MBES there is no clear indication of the amount of sediment drifts in Area A, although all historical sampling returned nodules.

Figure 6.5 Example of “ponded” sediment drifts and corresponding low nodule abundance Area B



Source: from TOML MBES backscatter and sample data; Diamonds are box-cores, cylinders are photo based, squares are historical samples. Abundance (coloured) in wet kg/m^2; acoustic absorption (backscatter; grey scale) in dB.

Figure 6.6 Example of sediment accumulating around seamounts



From MBES backscatter, TOML Area B

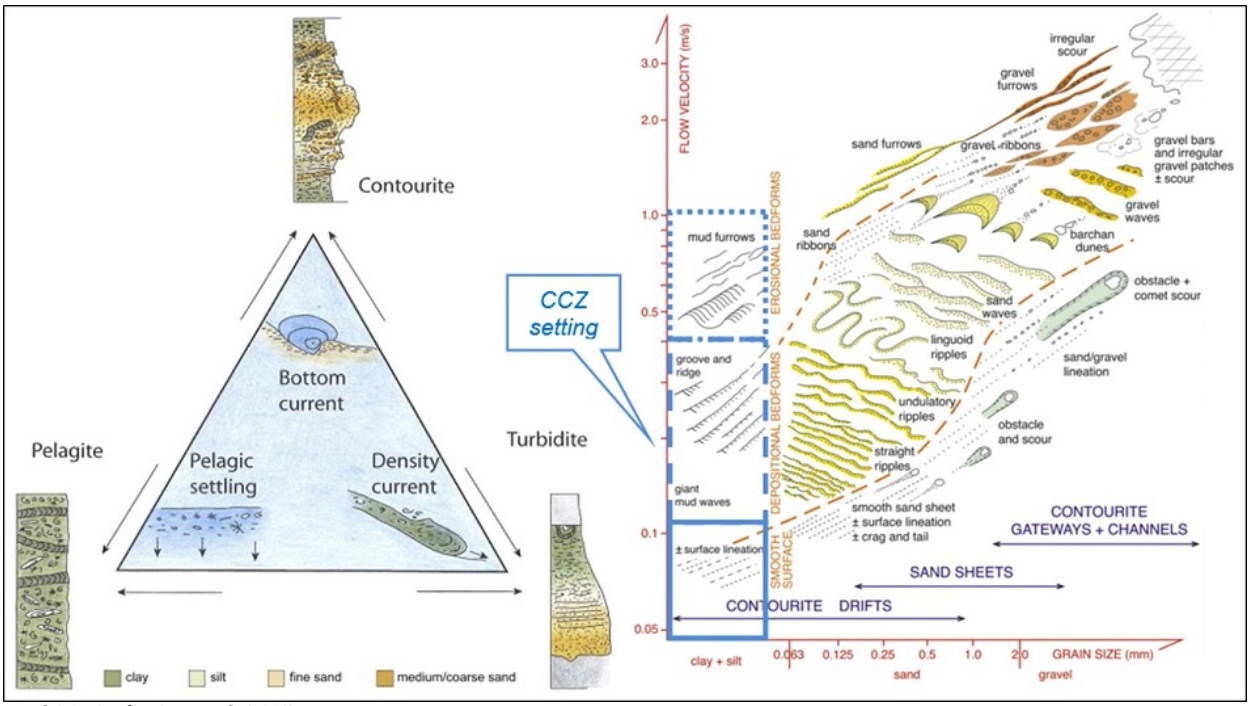
Dynamic changes in current and temperature near the CCZ seafloor have been known since the DOMES study in the late 1970s (Hayes, 1979). This includes current changes related to: tides; likely inertial reaction (e.g., to the Coriolis force); and more significant seasonal or episodic events. The seabed is typically quiet as:

- Seabed currents measured from moorings are typically low (~ 4 cm/s and up to ~12 cm/s); and
- Typically there is no detectable nepheloid layer (stirred up sediment) observed during survey.

Eddies travelling west along the CCZ are commonly observed at the ocean surface. Inall et al. (2015) describe data from a significant eddy, associating eddy surface currents of 40 cm/s at the surface with 10 cm/s currents on the seafloor of the CCZ approximately 4,100m below.

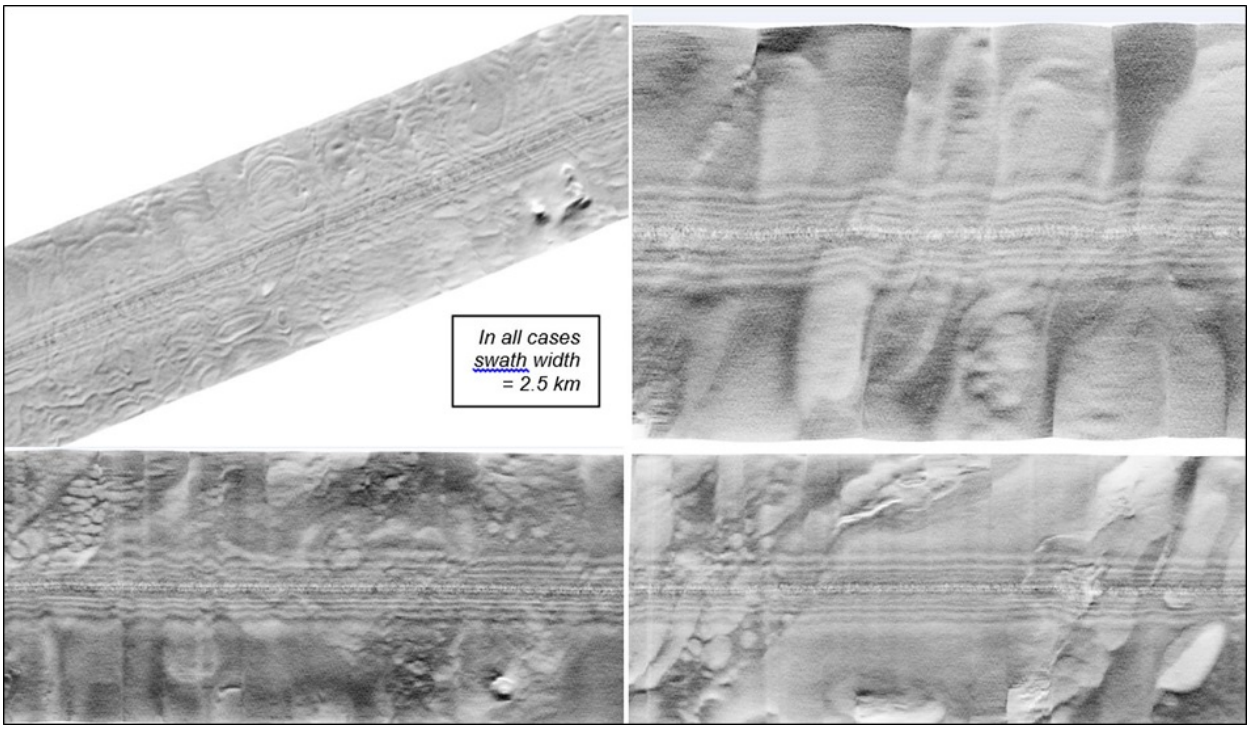
A variety of seabed deposits and patterns are observed and are interpreted to be due to seabed bottom currents (Figure 6.7, Figure 6.8).

Figure 6.7 Types of deep-sea sedimentary processes and deposits related to bottom currents



Sources: Rebesco et al (2014); after Stow et al. (2009)

Figure 6.8 Range of patterns in surficial sediment, TOML Areas D and C



Collected using 30 kHz side scan sonar which penetrates the sediment to some distance (cm to m) and which responds to sediment composition.

6.3 Polymetallic mineralisation

6.3.1 Sedimentation and nodule formation

Seafloor polymetallic nodules are composed of nuclei and concentric layers of iron and manganese hydroxides and formed by precipitation of metals from seawater. The metal accumulation rates are slow, and it generally takes millions of years to form a nodule (ISA 2004).

Nodules can be abundant in abyssal areas with oxygenated bottom waters and low sedimentation rates (less than 10 cm per thousand years). Nodules generally range from about 1 to 12 cm in their longest dimension, with the low to middle-range typically the most common (1 to 5 cm).

The specific conditions of the CCZ (water depth, latitude, and seafloor sediment type) are considered to be the key controls for its formation, along with the following factors:

- Supply of metals to the growing surface of the nodule.
- Occurrence of an oxygenated geochemically active layer at the seabed (sediment water interface).
- Effects over time on the geochemically active layer from benthic currents.
- Effects over time on the geochemically active layer from bioturbation.

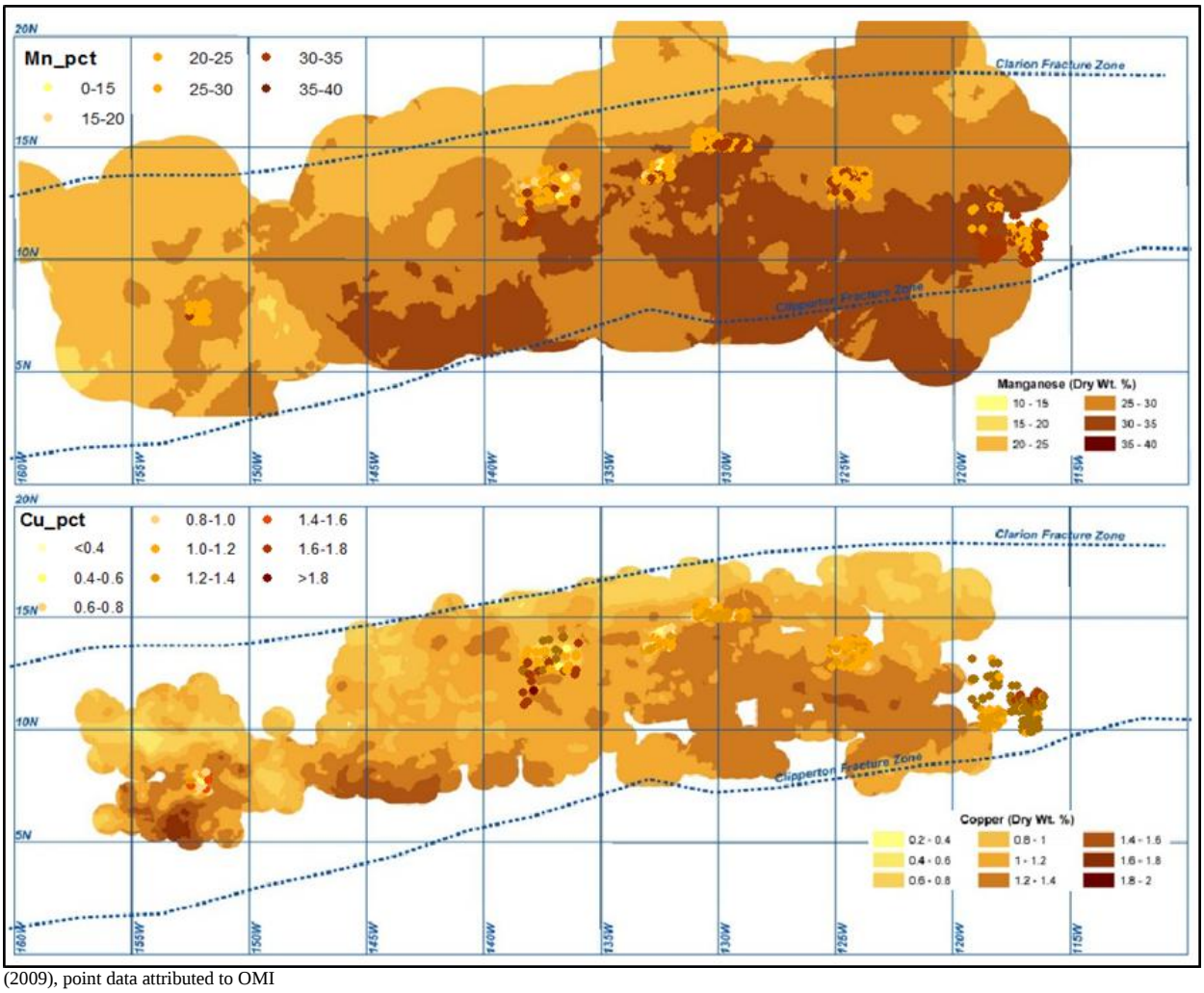
The highest values of metals in nodules are thought to be best developed on the seabed in the equatorial regions. In these regions surface waters have high primary productivity. Microorganisms accumulate metals in their growth relative to seawater and on death, they sink to the seafloor (either directly or through predator wastes), dissolve, and release the metals into the pore water of seafloor sediments. Being located away from terrestrial sources of sediments means that the metals are not preferentially accumulated by clay minerals. Commonly, the upper portion of the nodules accumulate metals directly from seawater, while the lower portion of the nodules, partially buried in sediment, accumulate metals from pore-water in the host sediments.

Sediments from the CCZ consist mostly of clays and some siliceous biological remains (e.g. frustules). Sands and larger sediments are not generally found so far from land, and any carbonate biological remains (e.g. skeletons) dissolve on the seabed in these deep-water regions faster than they accumulate. Some siliceous biological remains also dissolve at the seabed.

6.3.2 Nodule grades

Grade variation through the CCZ is well summarised by ISA (2010) and Morgan (2009) who combined datasets provided by several of the ISA contractors. Within the CCZ nodule field, nodule chemistry varies only slightly compared to the differences in mean nodule grades from other basins elsewhere in the world. The strongest trend is observed for Mn and Cu, which both increase towards the southeast (Kazmin in ISA, 2003; ISA, 2010; Morgan, 2009; see Figure 6.9). This may relate to proximity to metal sources from the East Pacific Rise or the American continents.

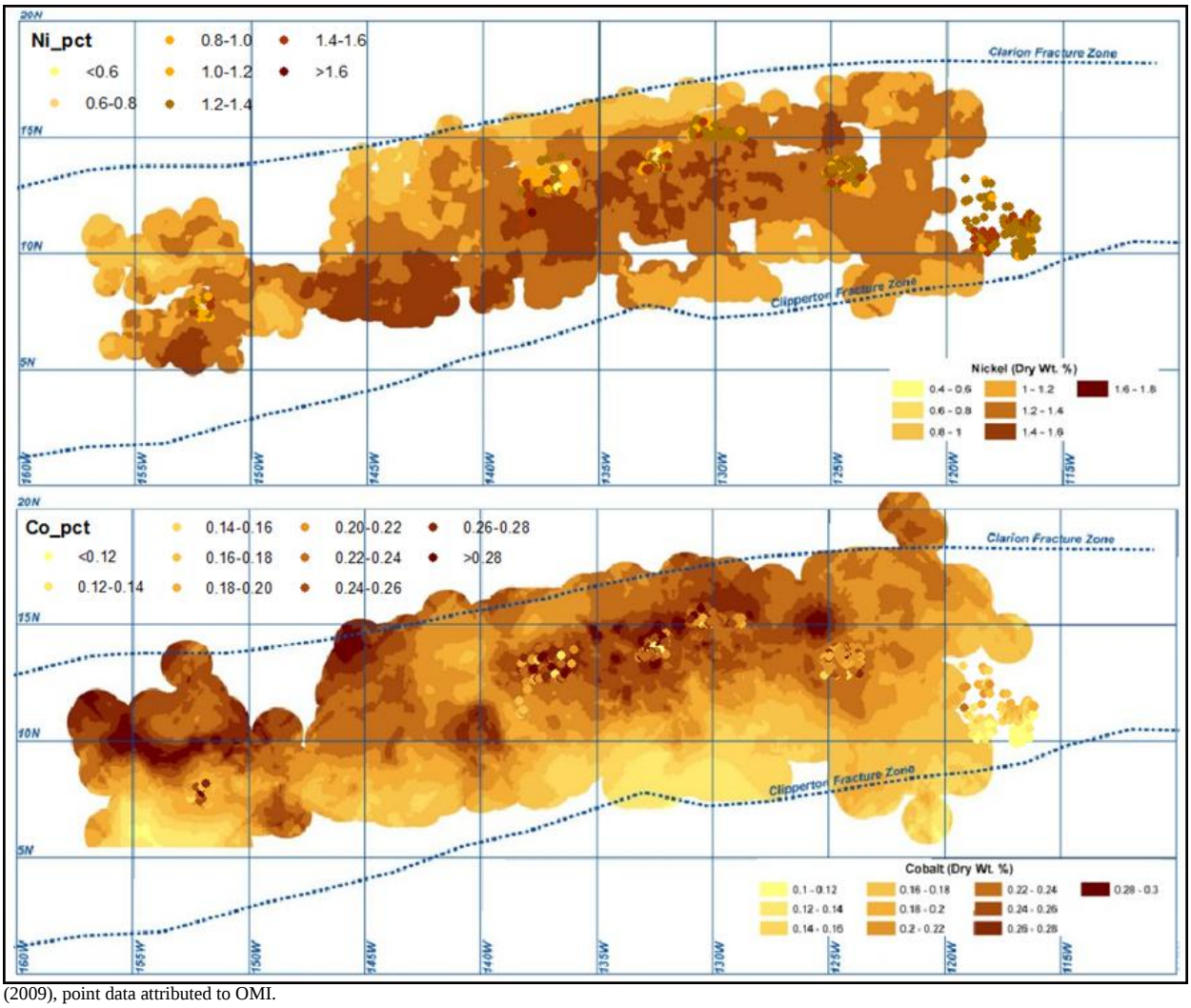
Figure 6.9 Modelled Mn and Cu grades in nodules across the CCZ



Source: Morgan (2009), point data attributed to OMI

In contrast, Ni and Co partly correlate along the central axis of the CCZ (Figure 6.10), with the Co appearing to be offset to the north from the Ni. The reason for the distribution of these metals is unknown but may relate to a lack of competition for the metals in the sediments, which have both lower chlorite and lower smectite in this region (Futterer, 2006).

Figure 6.10 Modelled Ni and Co grades in nodules across the CCZ



Source: Morgan (2009), point data attributed to OMI.

6.3.3 Grades of other metals

Grades for elements other than Mn, Ni, Cu and Co are not reported in the mineral resource for the TOML tenement area. Boxcores from CCZ15 campaign where analysed for a range of metals and these broadly agree with grades for a wider range of metals reported on Pacific nodules by McKelvey et al (1983), except for Rare Earth Element (REE) which are lower in the TOML dataset (see below). McKelvey et al (1983) do not separate out the grades of nodules from the CCZ but document average grades for nodules with Ni+Cu >1.8%, the bulk of which come from the CCZ. These are summarised below per the classification of McKelvey et al (1983) with their average grade followed by the average grade determined by TOML:

- Other base or alloy metals such as Zn (0.14%; 0.147%), Mo (0.039%; 0.064%), Ti (0.58%; 0.301%) and Pb (0.071%; 0.019%)
- Rare earth elements and other transition metals such as Sr (0.077%;0.057%), Y (0.012%; 0.009%), Zr (0.027%), Te (0.021%), La (0.019%; 0.012%), Ce (0.066%; 0.029%) and Nd (0.023%; 0.013%)
- Possible deleterious elements or reagent consumers and enhancers such as F (3%), Mg (1.57%; 1.94%), Al (2.96%; 2.47%), Si (8.26%;6.82%), S (0.319%; 0.13%), Cl (0.860%), Ca (1.73%; 1.76%), As (0.012%; <0.005% in some analysed dredge samples), and Ba (0.224%; 0.284%)

These levels of metals are supported in some cases (Zn, Mo) by data presented by Haynes et al. (1985), who also reported very limited data on Au and platinum group metals (all at the ppb level except Pt which averaged 0.1 ppm from 5 samples).

The REE values in the TOML tenement areas more closely agree with those published from the historical Lockheed Martin Exploration Area by Spickermann, (2012). This area is adjacent to TOML Exploration Areas B, D, and E. Total REE reported by Spickermann is about 0.08% (0.079% from TOML Areas A, C, B, D and F) with a median of 617 (619, TOML) ppm light REE (La-Eu) and 171 (180, TOML) ppm heavy REE (Gd-Y).

Also of interest is a clear trend of increasing Ba and S from TOML Area A, B and C to D and then to F. This trend suggests increased barite ($BaSO_4$) whose presence in turn is thought to represent increased primary productivity (or rather activity) within the diagenetic environment (Ba preferentially captures S released from decaying organic material in the sediment below the calcite compensation depth (e.g., Schulz and Zabel, 2006). This trend corresponds well with modern sea surface primary productivity.

6.3.4 Nodule abundance and estimation of tonnages

6.3.5 Nodule abundance

Polymetallic nodules lie on the seafloor sediment, often partly buried. Some nodules are completely buried, although the frequencies of such subsurface occurrences are very poorly defined. Kotlinski and Stoyanova (2006) document up to five discrete layers of buried nodules, although all were within 45 cm of the surface despite using sediment cores of 250 to 380 cm depth (i.e., all of these nodules are near surface). Other images of box corers also suggest that all or most of the nodules are at the surface. Consequently, drilling is not required for definition of the Mineral Resources.

The nodules vary in abundance, in some cases touching one another and covering more than 70% of the seafloor. They can occur at any depth, but the highest concentrations have been found on abyssal plains between 4,000 and 6,000 mbsl.

Nodule abundance is estimated either by:

- Taking a sample from the seafloor and dividing the weight of nodules by the area of the primary sampler;
- Using a photograph of nodules on the seabed to estimate their individual weight (e.g., as used by Kennecott; Felix 1980) which has been used with considerable success in some areas by TOML and dividing the weight of nodules by the area of the image.

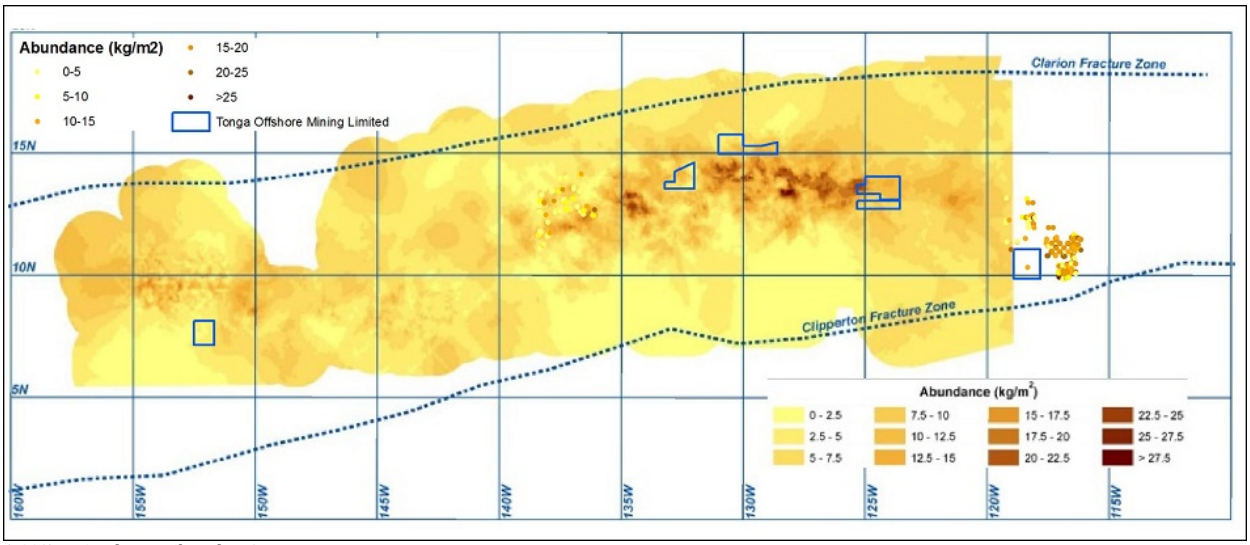
Nodule abundance is typically reported in wet kg/m^2:

- Wet weights are the most relevant in any collecting and transport operation;
- Often the nodule samples have multiple uses once collected at sea, some are for assay, others for environmental or metallurgical test work and some for reference (retaining the sample to dry and then weigh is less convenient);
- With complexity related to drying conditions and determining wet/dry density, weighing of the samples at surface is the simplest and most effective way to measure and compare nodule abundances between different campaigns and between the different contractors.

Sample aliquots were dried, crushed and pulverised before assaying. Using dry weight percent assays on wet weight mineral resource and inventory is a commonly accepted practice for similar bulk commodities that can contain significant amounts of free water (e.g., iron ore or Ni-Co laterite).

Nodule abundance variability is significantly higher than metal grades in most areas, suggesting that abundance estimation will be the key variable of uncertainty in mineral resource estimation. Figure 6.11 shows evidence of this compared to Figure 6.9 and Figure 6.10.

Figure 6.11 Modelled nodule abundance across the CCZ



Source: Morgan (2009), point data attributed to OMI.

6.4 Nodule Density and Moisture Content

6.4.1 Nodule density

Polymetallic nodules have an average wet density of about 2 t/m^3 (Table 6.2; Figure 6.12). TOML confirmed historical results from the north Pacific (Hessler and Jumars, 1974) through ~60 water displacement density measurements. The density measurements were done for both single nodules and for nodules in bulk, including fragments and sand resulting from attrition during transport and handing.

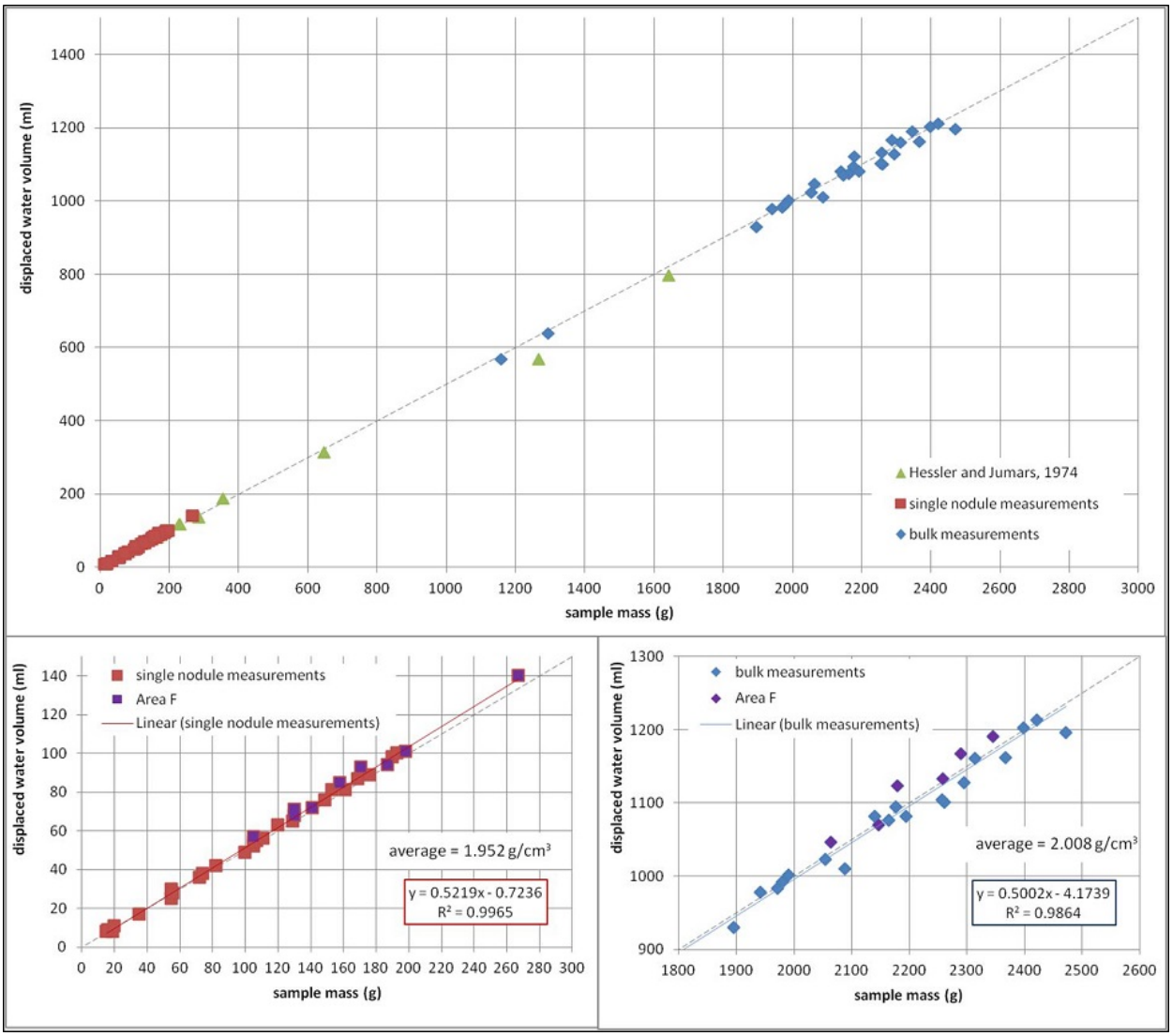
The results are similar except that the mean of the single nodules is ~2.8% lower than that of the bulk measurements. This might be due to air or water filled expansion cracks in the single nodules (that were collected ~7 months before the density measurements were made) the bulk nodule samples contained many more fragments that presumably relate to fractures along these cracks. The bulk nodule measurements are preferred over the single nodule measurements as they are likely more accurate due to larger sample size. The bulk nodule measurements also have a lower standard deviation.

Also noted is that Area F nodules might be slightly less dense than the other TOML tenement areas (Table 6.2; Figure 6.12). By averages this is of the order of 2–4%, being slightly more pronounced in the single nodule estimates. Nodule densities have not yet been measured for Area A.

Table 6.2 Nodule Density measurements TOML Area B, C, D and F

	Count	g/cm3					Standard deviation
		Min	Median	Mean	Max	Range	
Single nodules	34	1.78	1.95	1.95	2.38	0.60	0.11
Bulk nodules	27	1.94	2.01	2.01	2.07	0.13	0.03
Single nodules area F	9	1.83	1.91	1.90	1.99	0.16	0.06
Bulk nodules area F	6	1.94	1.97	1.97	2.01	0.07	0.02

Figure 6.12 Nodule densities of samples from TOML areas B-D, F, and central north Pacific



Single and bulk measurements from nodules collected during the CCZ15 campaign; historical values from Hessler and Jumars (1974)

6.4.2 Nodule water content

Exploitation of polymetallic nodules is likely to be done on a wet tonnage basis in that nodules will be transported, stored and sold without oven drying. In exploration, the abundance of nodules collected by free fall grabs or box-corers is also typically measured on the exploration vessel immediately after collection before the sample has time to air dry. Reporting a polymetallic nodule mineral resource on a wet basis is thus simpler and more appropriate than reporting on a dry basis, as is done for grade.

Total water content in wet nodules is estimated at 44% (Table 6.3), but the situation is further complicated as two main types of water are present:

- Water of crystallization included within manganese and iron oxide minerals. This was determined in TOML test work to consistently be about 16% by wet weight (including other likely trace levels of other volatiles). A very small amount of water of crystallization likely starts being removed at temperatures as low as 50–70 °C through a transformation of the manganese mineral buserite into birnessite, but most is stable until much higher temperatures (115 °C and greater; Novikov and Bogdanova (2007)).

- Free water included within pores and other cavities within the nodules including water adsorbed onto minerals – this is estimated to be around 28% by wet weight depending on the micro and macro void space in the nodules. Air-drying may remove approximately 16% (absolute) of this, with the rest by oven drying (up to 105 °C).

Estimating the water content is then complicated further again due to two properties specific to the nodules:

- The nodules have very high porosity (~50%; Ifremer, 2010) and are hygroscopic (Figure 6.13). Within a day of drying to 105°C pulped nodules will absorb at least 7% of moisture by mass if exposed to ambient air.

- Depressurization of the nodules after collection leads to mineral transformation (e.g., breakdown of feroxyhyte) and micro-fractures and fractures. Free water might be added into the cracks and micro-cracks. TOML tests suggest that four months after collection about 3% free water on a wet basis can be added into samples that are soaked in water (this 3% is not included in the totals indicated above).

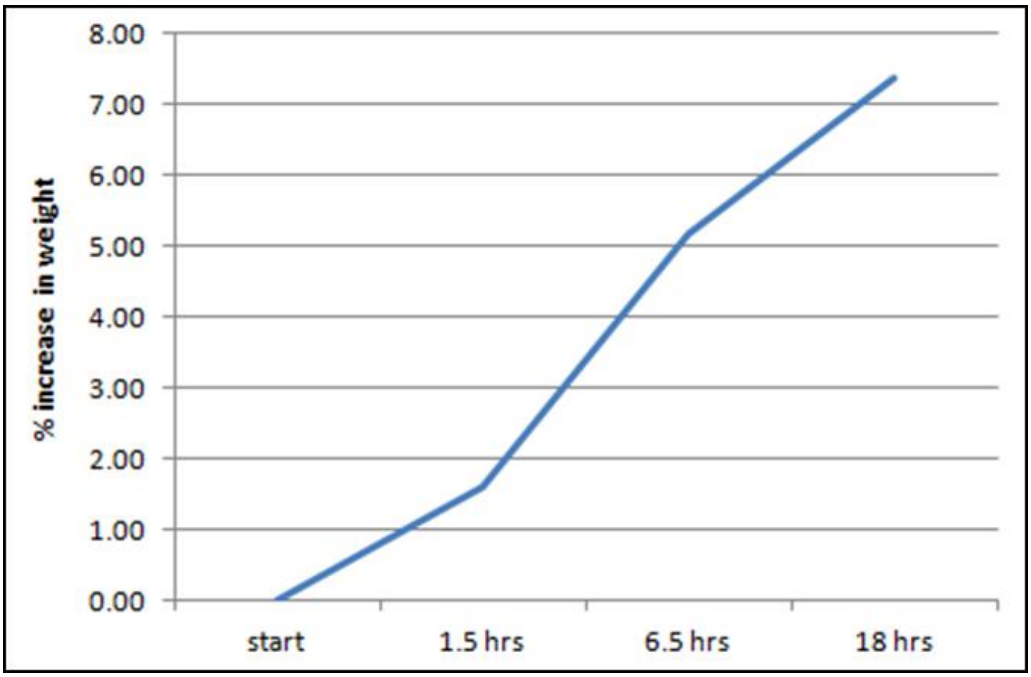
Published moisture values from the very comprehensive metallurgical reports by Haynes et al. (1985) and Fuerstenau et al. (1973) are summarised below along with TOML results.

Table 6.3 Comparison with published moisture contents

Source	Total Moisture	Free Moisture	Water of Crystallisation
Mero (1965) p233	–	30-36*	–
Fuerstenau et al. (1973)**	>22.66%	13.1%	>8.74%
Haynes et al. (1985)	45-50%	35–45% with about half able to be dried in air	5-10%
Wiedicke-Hombach et al (2012)	44%	Not specified	Not specified
TOML measurements	44%	28% with about 60% of this able to be dried in air	16%***

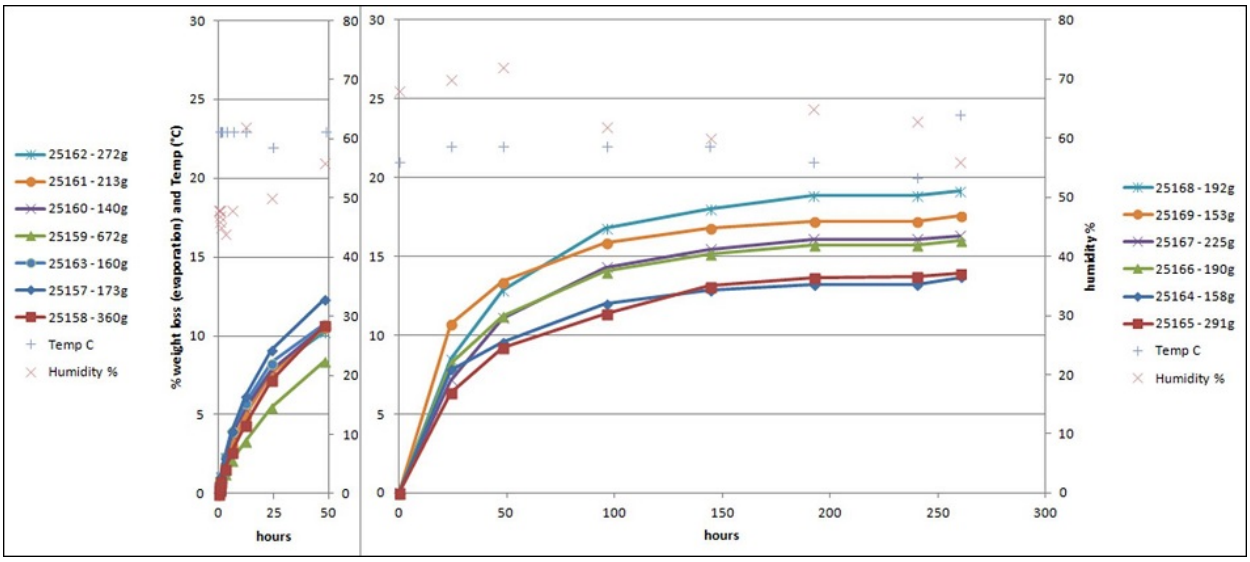
* drying temp not specified may include some water of crystallization;
**used in the 2012 Nautilus CCZ NI43-101 report (Golder, 2013) to characterise moisture;
*** includes ±2% water of crystallisation lost up to 105°C

Figure 6.13 Nodule sample (pulp) absorption after drying to 105°C for 6 hours



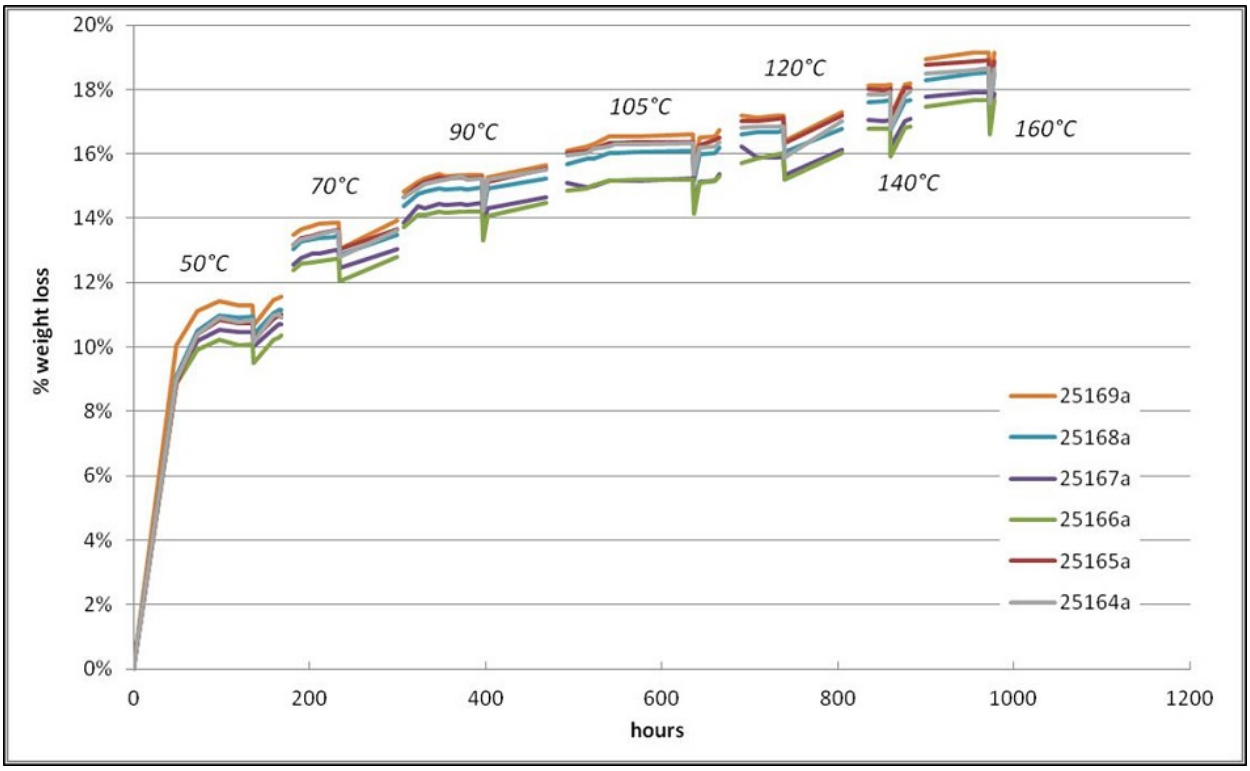
Test work done by TOML on select nodules involved three stages of drying. Stage one was air drying at up to 260 hours at ambient temperatures of 22 °C to 25 °C and humidity of 50% to 60% (Figure 6.14). Moisture content lost by the time of stabilisation (around 200 hours at these ambient temperature and humidity) varied between 13% and 19%.

Figure 6.14 Air drying results for a short term sample batch (L) and a long term sample batch (R)



Stage two was oven drying at up to 978 hours in seven temperature steps. From Figure 6.15 the moisture content lost was a very consistent 15% to 16.5% at 105°C and 18% to 19.5% at 160 °C.

Figure 6.15 Oven drying results for nodules



Between each oven drying temperature the samples were left exposed to ambient air for one hour to measure hydroscopic weight increase. Whole nodules absorbed water more slowly than pulverised nodules (e.g., Figure 6.13).

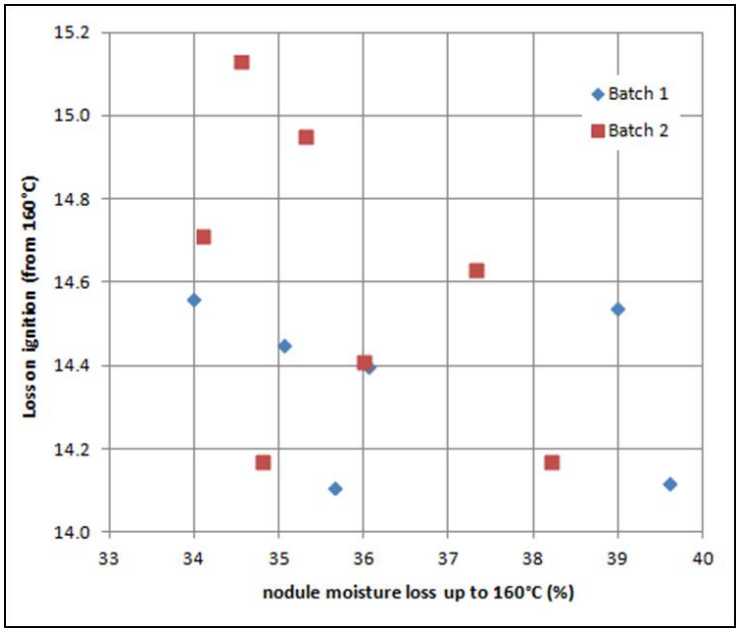
Stage three was loss on ignition (LOI) where samples were pulverised and effectively sintered at 1,000°C, driving off all moisture that might include other types of “combined water” (hydrates and labile hydroxy-compounds) and carbon dioxide although the latter is thought to be minimal in nodules.

From Figure 6.16 the LOI from 160°C was remarkably constant for the test samples between 14% and 15.2% which equates to:

- 10.6% to 11.8% from 160 °C on a starting wet basis.
- 16.8% to 18% from 105 °C. The results are comparable with other TOML analyses and figures from some sources:
  - Mero (1965) reports LOI (1100°C) of 15% to 39% averaging 25.8% but from nodules at an “air dried” level.
  - Reference material CGL131 (a nodule standard from the eastern German area in the CCZ) averaged an LOI of 16.98% from 16 laboratories, although the figure is not certified.

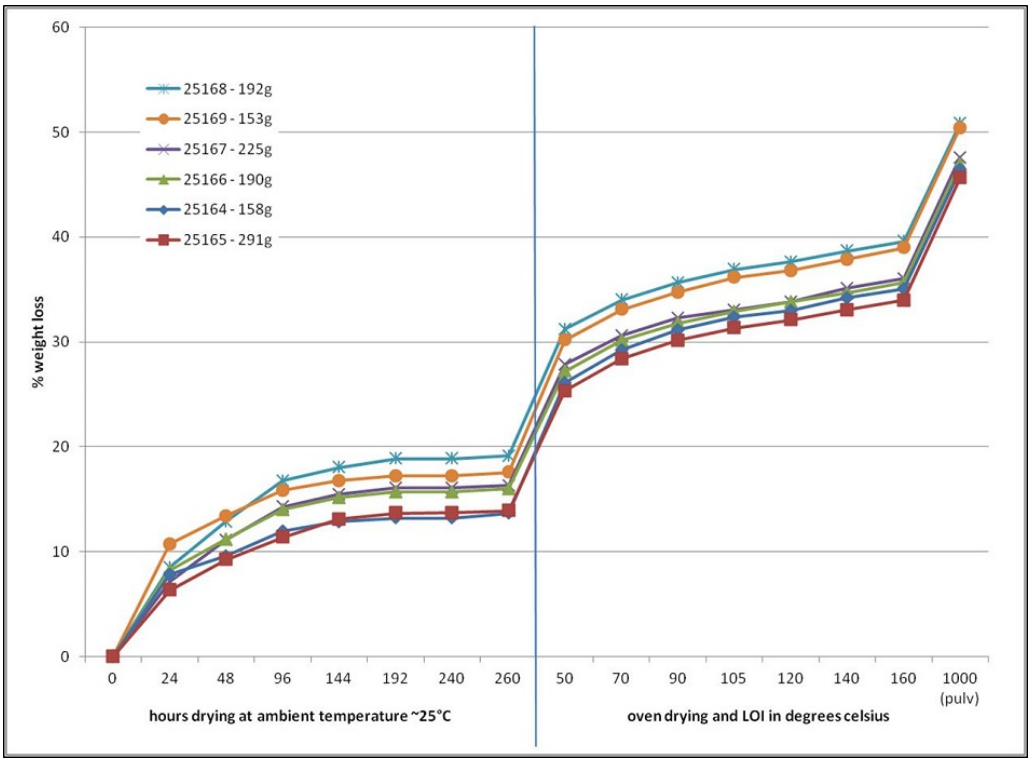
Other workers report higher LOIs (20% to 25%) but do not specify the drying method in enough detail for valid comparison. The chance of hygroscopic absorption of moisture cannot be discounted.

Figure 6.16 Loss on ignition (at 1,000°C) for two batches of TOML samples



A combined drying curve is summarised in Figure 6.17. Average total moisture content is 47% with most of the variance in total moisture apparent from the earliest stages of air-drying (48 hours at ambient temperature). With consideration of ~3% storage water absorbed into post sampling expansion cracks (see above) a standard total moisture content of 44% is derived.

Figure 6.17 Three stage drying curve for polymetallic nodules



Average total moisture content is 47% with most of the variance in total moisture apparent from the earliest stages of air-drying (48 hours at ambient temperature). After adjustment for absorbed water (determined in a separate test involving samples sealed from collection and sampled soaked before drying) an effective moisture content of 44% is arrived at.

In the estimation of moisture content (or other component) wet basis is taken before any air drying or soaking, dry basis is taken at 105 °C and a volatile free basis is taken after LOI at 1,000 °C with all volatiles removed. Other bases are mentioned in the text with the temperature specified.

6.5 Diagenetic Crusts

The minor amounts of ferro-manganese crust found in the CCZ are not the same as hydrogenetic cobalt-rich crusts typically found on the top of seamounts e.g., in the Pacific Prime Zone in the north-west Pacific Ocean (e.g., Hein and Koschinsky, 2013).Two types have been logged, both by TOML and other workers (e.g., Ifremer; Menot et al., 2010):

- Massive crust is five to ten centimetres thick and is typically found in blocks several decimetres a side but occasionally as pavement; and
- Crustal-nodules are small to medium sized (<20 cm) discrete fragments of ferro-manganese that can grade into nodules.

In total, crusts were logged in ~0.6% of the photo-profiles, with crustal nodules more common (~0.5%) and massive crusts being present only ~0.1% of the time. Neither type was collected in box-cores during the TOML CCZ15 campaign, and their extent is deemed insignificant in terms of the mineral resource estimation in Section 11.

6.6 Deposit Types

Surface and near surface polymetallic seafloor nodules are the only mineralisation type classed as a deposit in this report.

6.7 TOML Nodule Types

TOML's classification system was developed near the end of the CCZ15 campaign, once a wide range of characteristic nodules had been studied (Table 6.4). The classification aims to be simple and modular with two required codes (size then type, as per the ISA system) and three optional suffix codes (aspect of the nodules form, degree of fragmentation typically seen, and degree of development of botryoidal texture); as summarised in Table 6.4. Examples of type are also shown in Figure 6.18 and Figure 6.19.

Table 6.4 TOML CCZ15 Nodule classification and proportions seen in logging during CCZ15

		1:size Long Axis					
		=<2 cm		**2-5 cm**		**>5 cm**	
		s	**sm**	**m**	**ml**	**l**	**mx** (mixed)
		(small)		(medium)		(large)	18%
		8%	11%	20%	24%	18%	
2: type	**S**	*s-S 1%*	*sm-S 2%*	*m-S 1%*	*ml-S 1%*	*l-S 0%*	*mx-1%*
	(smooth)						
	10%						
	RS	s-SR 7%	sm-SR 8%	*m-SR 13%*	*ml-SR 22%*	*l-SR 18%*	*mx-SR 17%*
	(rough-smooth)						
	84%						
	R	s-R 1%	*sm-R 2%*	*m-R 2%*	*ml-R 1%*	*l-R 0%*	*mx-R 1%*
	(rough)						
	6%						

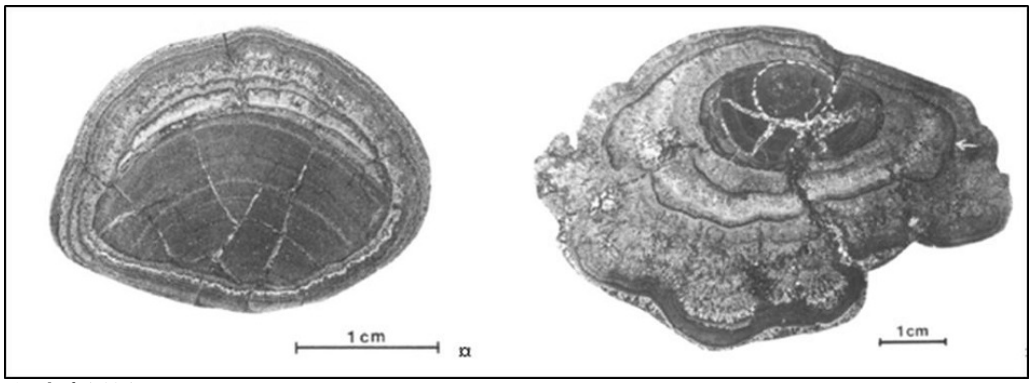
3: aspect/oblate				
high	**regular**	**low**	**irregular**	**prolate**
-hi	*-rg*	*-lw*	*-ir*	*-pr*

4: fragmentation		
rare	**mod**	**common**
-ra	-md	-cm

5: botryoidal		
well dev.	**poorly dev**	**absent**
-bo	-po	-no

From Table 6.4 it is apparent that in the TOML area at least, rough-smooth nodules are the most common, especially in the medium to large size range.

Figure 6.18 Sections through a S-type Nodule (left) and a R-type Nodule with a S-type core (right)



Source: von Stackelberg and Beiersdorf, (1991).

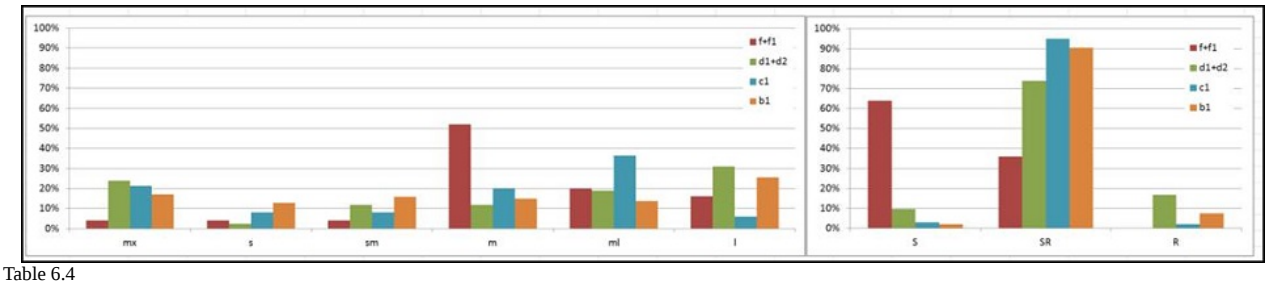
Figure 6.19 Example nodules found in the TOML area



Smooth (top left), rough-smooth (top right), rough (bottom left) and overturned rough-smooth (bottom right) types

Between TOML tenement areas B - F there are notable differences in the sizes and types of nodules present (Figure 6.20). Area F is distinctive for having generally more medium S type nodules than the other areas (although it also contains large SR type nodules of generally high aspect). Area C1 has very few truly large nodules with medium to large SRs dominating. Areas B1, and D1-D2 have a wider range of sizes again mostly (70–90%) of SR type although B1 has some discrete areas of smaller nodules. Two dredge samples from Area A contained mostly small smooth nodules, and as mentioned below one of these looks to be mostly of hydrogenetic character.

Figure 6.20 Nodule size and type within the areas sampled during TOML CCZ15



Codes are per Table 6.4

6.8 Variation in TOML Nodule Grades

Grade variation in CCZ nodules is remarkably low. Basic statistics pertaining to grade are included with the Mineral Resource data review in Section 11.

During the CCZ13 and CCZ15 TOML campaigns, dredge samples were taken for metallurgical test work and the opportunity was taken to analyse numerous (~30 per dredge) sub-samples of nodules to better establish grade variation within a small area.

These dredge sub-sample results are compared below with box-core and historical results for Ni, Cu, Co and Mn (Figure 6.21 and Figure 6.22). Bear in mind that the three datasets all cover different areas with:

- historical samples covering all of TOML A-E;
- TOML box-cores (BC) all of selected sub-areas in Areas B, C, D and F; and
- dredge samples in select locations.

Key conclusions from this comparison are that:

- There is generally good to excellent agreement between dredge samples and the more widely sampled but internally consolidated samples from box-cores;
- There is generally excellent agreement between the historical data (section 9.1) and the TOML dredge and box-core samples with the exception of Mn (higher in the TOML samples from some areas as discussed in Section 11);
- Some of the regional grade trends are seen between the TOML Areas (e.g., Area B has generally higher Ni and lower Cu than Area C, while Area F has distinctly lower Co);
- The lower grade nodules from box-cores from Area B1 seen in Figure 6.21 and Figure 6.22) tend to be found in a single area in the central-eastern part of the area (B3645 and surrounds), that is characterised by typically R-type nodules and frequently low to very low abundances;
- Area A and B nodules have a greater range in grade consistent with more variable ratios of diagenetic to hydrogenetic formation (higher Co and Fe).

Figure 6.21 Nodule variance in Ni and Cu for dredge and box-core samples in the TOML Areas

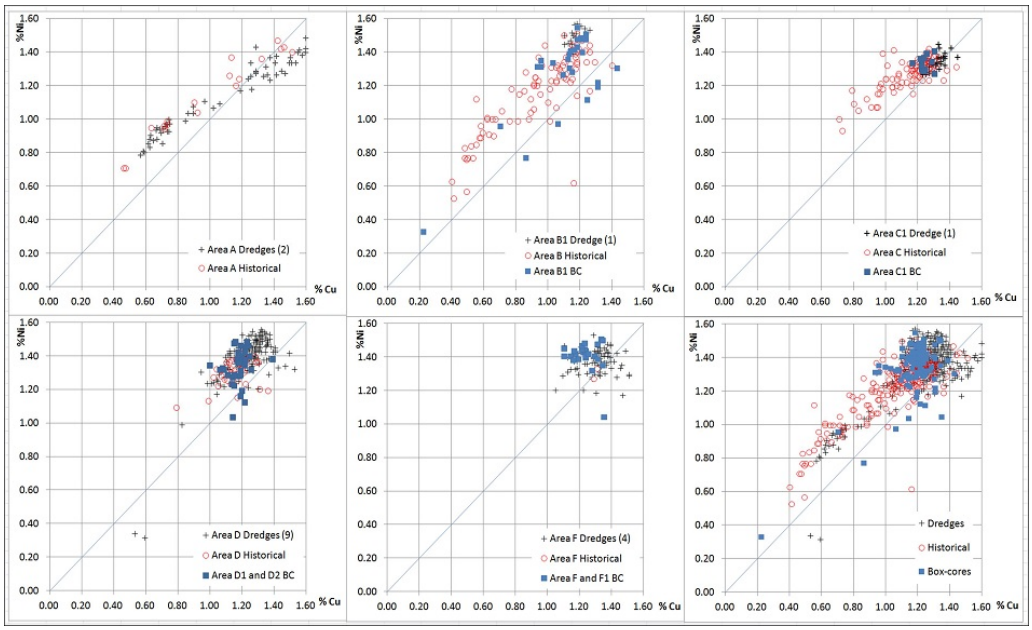
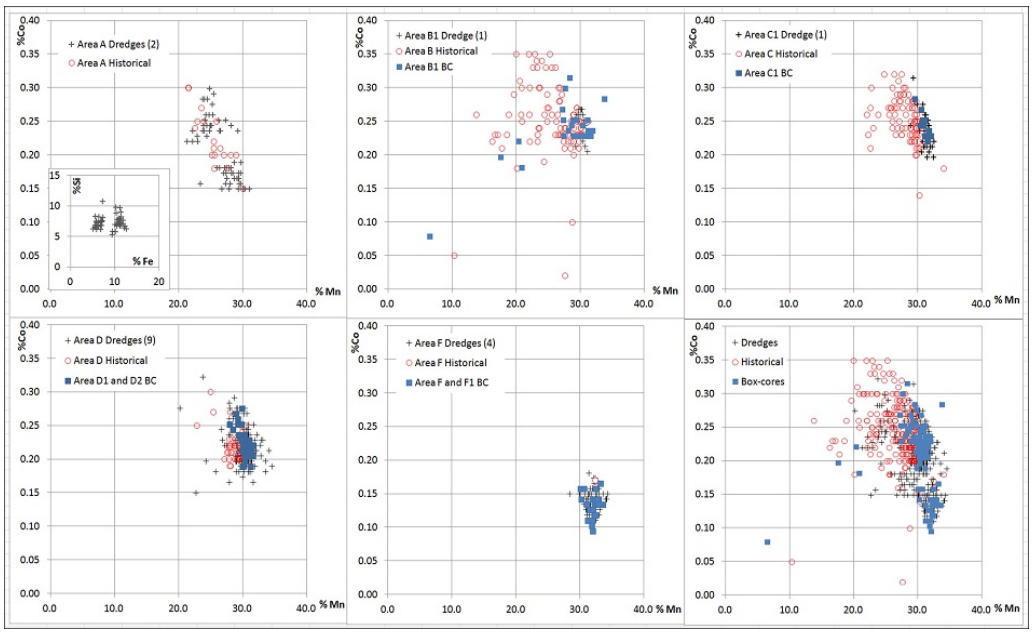


Figure 6.22 Nodule variance in Mn and Co for dredge and box-core samples in the TOML Areas



6.9 Nodule Distribution

The distribution of nodules though the CCZ is not constant, and likewise their abundance varies within the TOML contract areas. Areas with few or no nodules that can be discriminated in mapping are:

- Volcanic areas (seamounts and more recent flows)

- Slopes or escarpments (from ongoing normal faulting and both of basement basalt and overlying sediment)
- Areas of “no nodules on ooze” (Nnoo) that are thought to be areas of drifting sediments that preclude nodule formation.

As noted in Table 6.5, only the volcanic areas and Nnoo sediment drifts were domained separate to the sediment bearing nodules in the mineral resource estimate.

Table 6.5 MBES mapped seabed classification and proportions

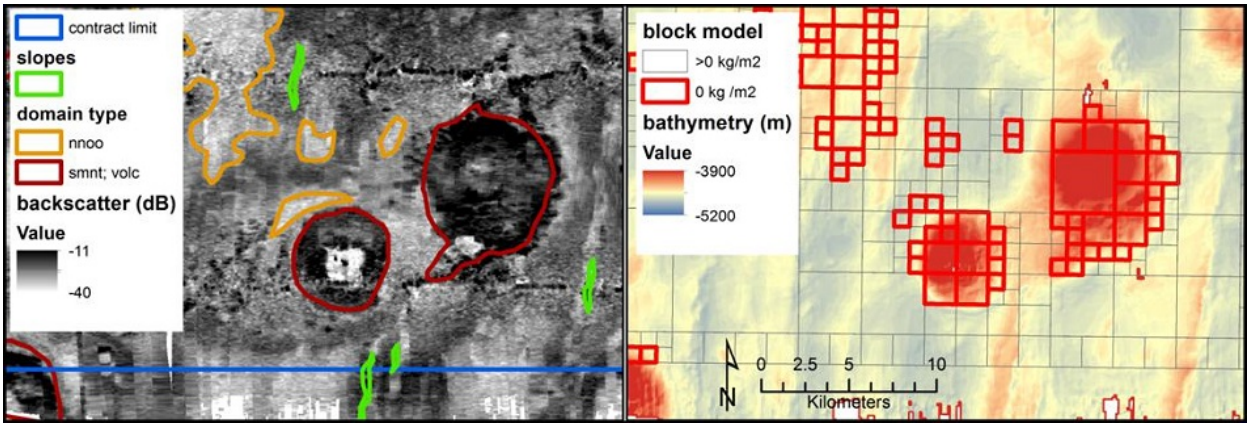
Area	Volcanic exposure	Nnoo sediment	Slopes	Nodule bearing
B	5.9	6.0	3.9	84.2
C	1.8	5.6	3.2	89.4
D + E	3.0	12.9	4.2	79.9
F	1.5	2.1	4.9	91.6

Note that without MBES survey, it is not possible to estimate the proportions of the above mapped units in Area A.

Strictly speaking, most of the above discriminated areas still contain some nodules. Small nodules are found on seamounts and in amongst the escarpments. Sediment drifts also usually contain the occasional nodule as seen in seafloor photos. There may also be nodules buried near the edge of sediment drifts.

Dealing with these areas in the mineral resource estimate is described in Section 11. Mapping based on MBES (e.g., Figure 6.23) estimates the area with no or insignificant nodules to comprises 10 to 20% of the total area (Table 6.5).

Figure 6.23 Mapped areas of volcanic rocks, slopes and Nnoo sediment in part of TOML Area B



Note that over-estimation of area of slopes is likely due to smoothing from the relatively coarse (60–120 m) resolution of the shipborne 12 kHz MBES and the nature of interpretation. Slopes were not significant enough to be domained out in the mineral resource estimate. There is also the possibility that many of the mapped volcanics of lower relief are partly covered with sediment and nodules. Box-core sampling of Nnoo type areas was done if that unit was covered by the planned sample grid in the CCZ15 campaign. Direct correlation of nodule abundance with MBES backscatter was relatively poor.

6.9.1 Importance of buried nodules

Sediment is thought to cover even surficially located nodules from time to time, due to ongoing sedimentation and the effect of seafloor currents. In many cases, grazing holothurians clear any accumulated sediment off the nodules.

In logging during TOML's CCZ15 campaign, a clear distinction was made between:

1. **Powder** a thin coating of sediment, usually so little (~ 5 mm) that the outline of the nodule can be seen in a photograph;

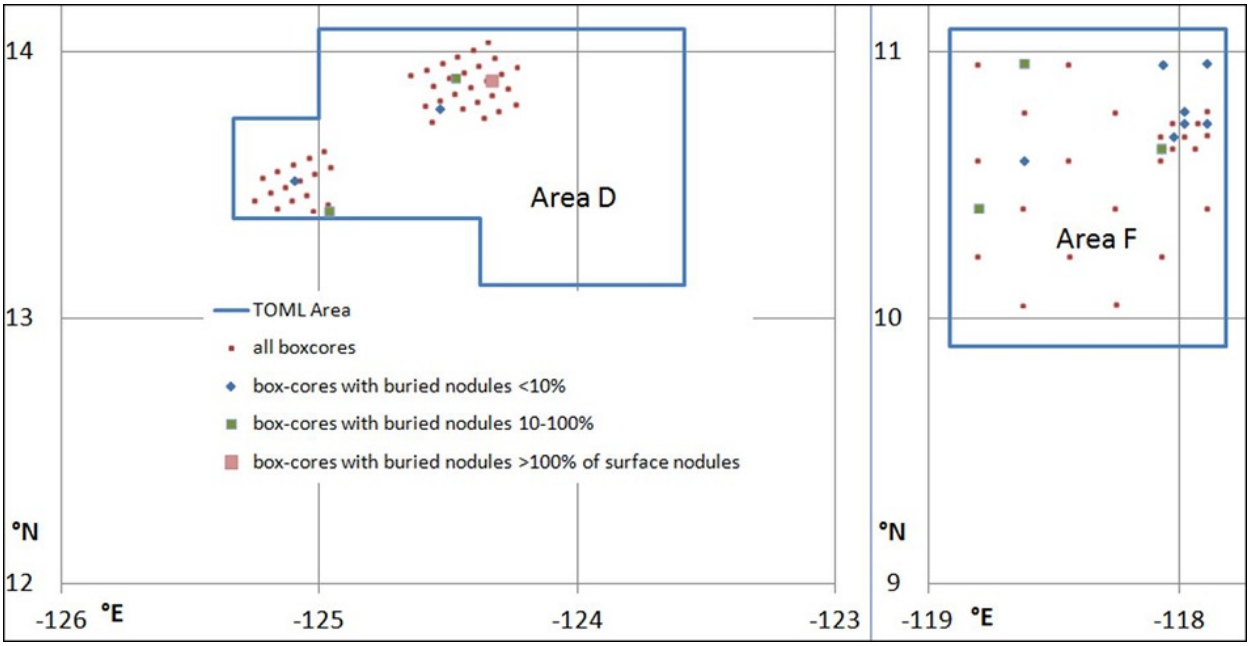
2. **Cover** is up to several centimetres of sediment, obscuring the nodule completely from vision, maintaining the nodule within the geochemically active layer and with the amount of cover irrelevant to sampling and collecting methods;

3. **Buried** was defined as when there is greater than 10 cm of sediment on the nodule. Buried nodules often are below the geochemically active layer. As they are likely located too deep for a nodule collector, they were collected from the box-cores in CCZ15 purely for reference purposes and their weights and chemical analyses were **not included** in the dataset supporting the mineral resource statement.

Buried nodules often have a very soft brown powdery surface, which is thought to reflect surface 'corrosion' due to reduction and breakdown of the nodule. However, this was always seen on the surface of nodules and no extensively degraded remnants were seen. Many buried nodules have the size and textures of large to medium SR type (see TOML classification in Table 6.4 above) indicating that they were at the surface for a long period of time before burial. When present in the box-cores, the buried nodules were often found in groups at the same depth, and it is suspected that they became buried by falling into burrows due to undermining. Buried nodules tend to be larger than the average nodules found at the surface.

Buried nodules are uncommon. A total of 16 out of the 113 box cores taken during CCZ15 had buried nodules and all of these were located in Area D and F (Figure 6.24). If just Areas D and F are considered, then buried nodules were found in about 23.8% of samples which is a similar ratio to that described by Kotlinski and Stoyanova (2006) who found 22.6% within the part of the IOM contract area (59 of 261 sample sites).

Figure 6.24 Location and percentage of buried nodules found during CCZ15



7 Exploration

Exploration in the TOML tenement area comprises two main phases:

- Historical work and data collected by the pioneer contractors who returned Reserved Areas to the ISA. This work underpins much of the inferred mineral resource estimated in Section 11 and reported previously (Golder Associates, 2013).
- TOML work and data acquired by TOML during two exploration campaigns in 2013 and 2015 (called CCZ13 and CCZ15 respectively in this report). This work underpins part of the inferred mineral resource estimate as well as all of the indicated and measured mineral resource estimates.

7.1 Historical Data

Six exploration groups are known to have surveyed areas within the TOML tenement area and collected samples of polymetallic nodules. Much of this work overlapped as it predated the signing of the Law of the Sea. These include the Japanese group (DORD), the South Korean group (KORDI), the Russian Federation group (Yuzhmorgeologiya), the French group (Ifremer), the German group (FIGNR or BGR), and the consortium, Ocean Minerals Company (OMCO). The timing and location (ISA, 2003) of the OMCO sampling is known but the results are not available outside of ISA published contour maps.

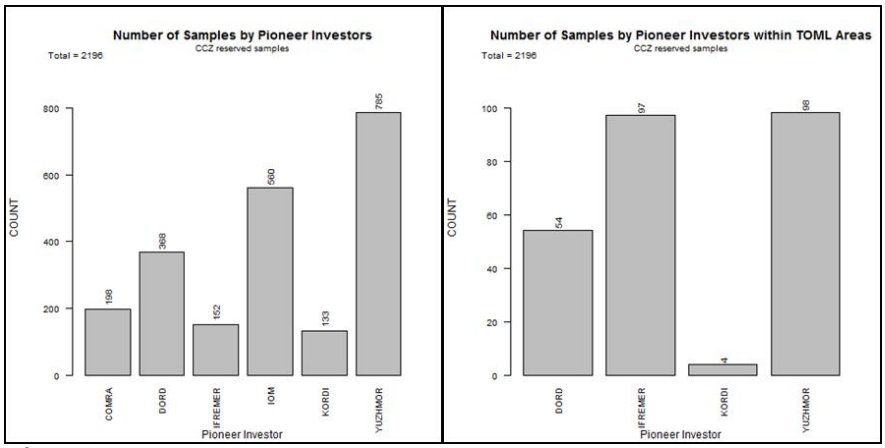
Virtually all the samples in the TOML tenement area were obtained by free fall grab (FFG) samplers, although a few results from box corers (BC) were also included. As detailed in section 7.5.6, nodule abundance (wet kg/m^2) is derived by dividing the weight of recovered nodules by the surface area covered by the open jaws of the sampler or corer (typically 0.25 to 0.5 m^2 but in some cases as much as 1 m^2). Assays were done on dried sample splits by commonly used spectrometric methods (AAS and XRF).

7.1.1 Nodule Sample Data Supplied to TOML

The TOML tenement area was a Reserved Area and as such was sampled by Pioneer Investor or developed nation sponsored contractors. These samples provided the basis of a database held and maintained by the ISA. These data were used initially to define the areas of the TOML application, and subsequently to estimate an inferred mineral resource for the part of the TOML tenement area they covered (Golder Associates, 2013).

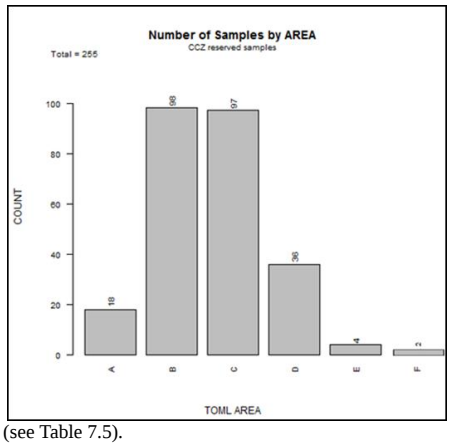
Bar plots showing the total number of samples within the TOML tenement area collected by each Pioneer Investor or developed nation contractor are presented in Figure 7.1 and Figure 7.2. The statistics for the samples that contain both abundance and grade data inside the TOML tenement area are tabulated in Table 7.1 to Table 7.6. Samples in the CCZ but outside the TOML tenement area are presented in Table 7.6.

Figure 7.1 Total Number of Samples by Pioneer Contractor.



Pioneer Contractors are sometimes referred to as Pioneer Investors

Figure 7.2 Total Number of Samples by TOML tenement areas.



Note that 8 additional samples were received for Area E from IOM (see Table 7.5).

Table 7.1 Summary of Historical Grab Samples Area A

(ex-DORD)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	18	18	18	18	18
Minimum	21.46	0.15	0.71	0.46	2.68
Maximum	30.05	0.30	1.47	1.51	17.93
Mean	25.40	0.22	1.14	1.00	10.12
Median	25.50	0.21	1.15	1.02	9.19
Standard Deviation	2.44	0.04	0.24	0.35	5.08
Coefficient of Variation	0.10	0.18	0.21	0.35	0.50

Table 7.2 Summary of Historical Grab Samples Area B

(ex-Yuzhmorgeologiya)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	88	88	88	88	88
Minimum	10.30	0.02	0.53	0.40	0.03
Maximum	31.20	0.35	1.51	1.40	26.00
Mean	25.40	0.25	1.16	0.94	8.82
Median	26.55	0.25	1.23	1.02	8.09
Standard Deviation	4.19	0.06	0.23	0.26	5.87
Coefficient of Variation	0.16	0.22	0.20	0.27	0.67

Excludes samples that had no nodules.

Table 7.3 Summary of Historical Grab Samples Area C

(ex- Ifremer)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	78	78	78	78	78
Minimum	22.01	0.14	0.93	0.71	1.35
Maximum	30.90	0.32	1.42	1.44	21.25
Mean	27.91	0.25	1.27	1.15	9.98
Median	28.55	0.25	1.29	1.19	9.17
Standard Deviation	2.13	0.03	0.10	0.15	4.20
Coefficient of Variation	0.08	0.13	0.08	0.13	0.42

Excludes samples that had no nodules.

Table 7.4 Summary of Historical Grab Samples Area D

(ex-DORD)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	36	36	36	36	36
Minimum	22.79	0.19	1.09	0.79	0.12
Maximum	30.45	0.30	1.44	1.36	16.37
Mean	28.52	0.22	1.31	1.16	7.68
Median	28.76	0.22	1.32	1.17	7.78
Standard Deviation	1.47	0.02	0.08	0.10	4.09
Coefficient of Variation	0.05	0.10	0.06	0.08	0.53

Table 7.5 Summary Historical Grab Samples Area E

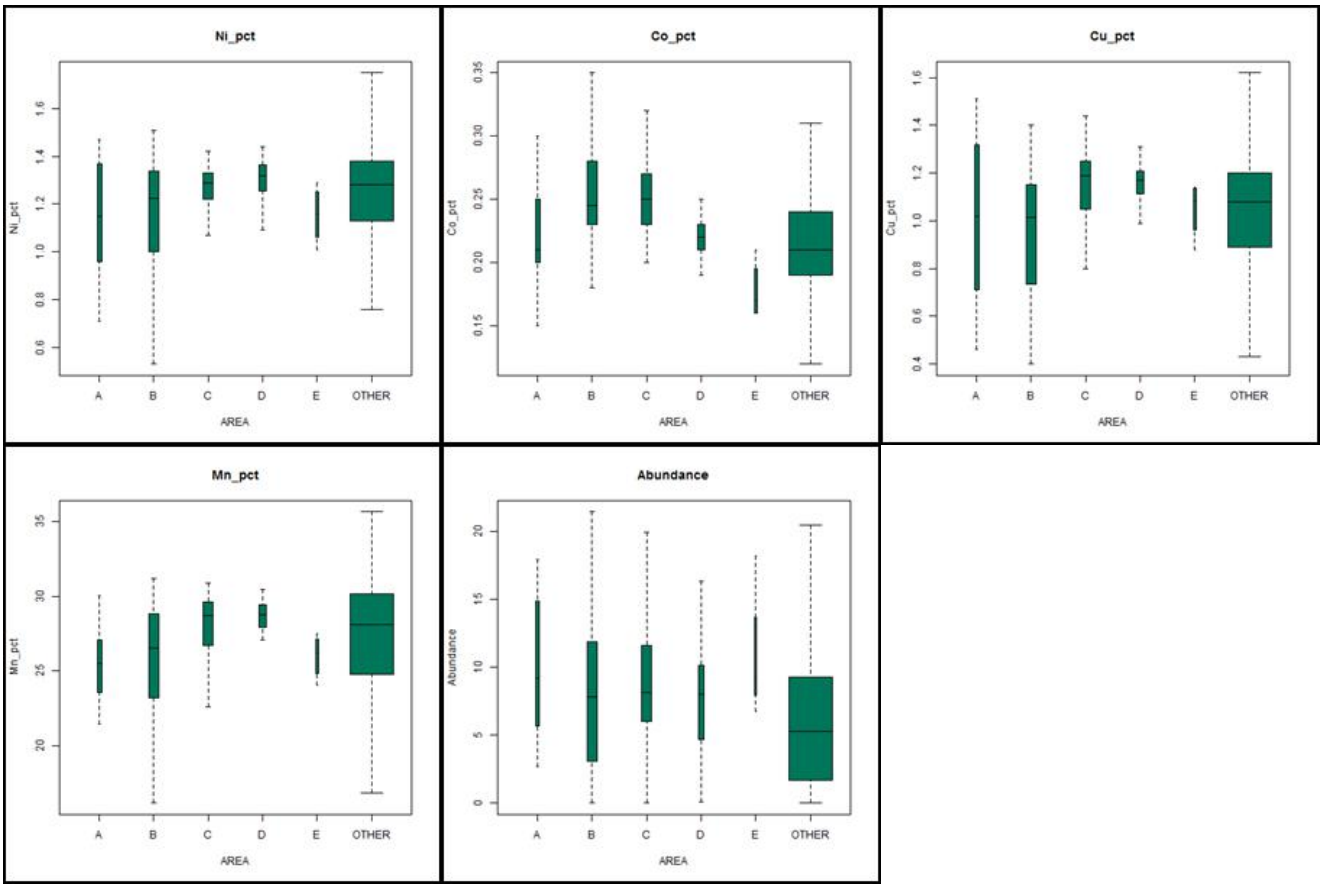
(ex-KORDI, IOM)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	10	10	10	10	10
Minimum	24.04	0.16	0.96	0.69	1.48
Maximum	31.34	0.27	1.43	1.27	22.90
Mean	27.54	0.21	1.21	1.07	11.34
Median	27.17	0.22	1.21	1.11	9.22
Standard Deviation	2.58	0.04	0.18	0.17	6.82
Coefficient of Variation	0.09	0.18	0.15	0.16	0.60

Table 7.6 Summary of Historical Samples from the Reserved Areas outside the TOML tenement area

	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	2188	2188	2188	2188	2188
Minimum	4.14	0.05	0.15	0.12	0.01
Maximum	35.62	3.23	1.75	1.62	52.20
Mean	27.47	0.21	1.25	1.04	8.21
Median	28.47	0.21	1.30	1.09	7.10
Standard Deviation	4.06	0.08	0.20	0.24	6.06
Coefficient of Variation	0.15	0.40	0.16	0.24	0.74

The above tables and Figure 7.3 indicate that all of the TOML tenement areas have similar ranges of grade and abundance to the rest of the CCZ deposit. The coefficients of variation of grades are low compared to most terrestrial mineral resources. Abundance values vary more widely, making abundance estimates the key variable of uncertainty in mineral resource estimation. For the historical data, sample spacing is predominantly wide (10 km to 30 km). However, there are a number of closely spaced samples (500 m to <10 km) but these are insufficient to constrain the short range controls on grade and abundance within the TOML tenement areas. TOML's own sampling (see below) serves to constrain the short range.

Figure 7.3 Box Plots of historical sample grades within the TOML tenement areas.



Box size represents 1st and 3rd quartiles centred on the median and box width reflects number of samples

Figure 7.4 Box Plots comparing the 6 Pioneer Investor Reserved Area Data Sets across the entire CCZ.

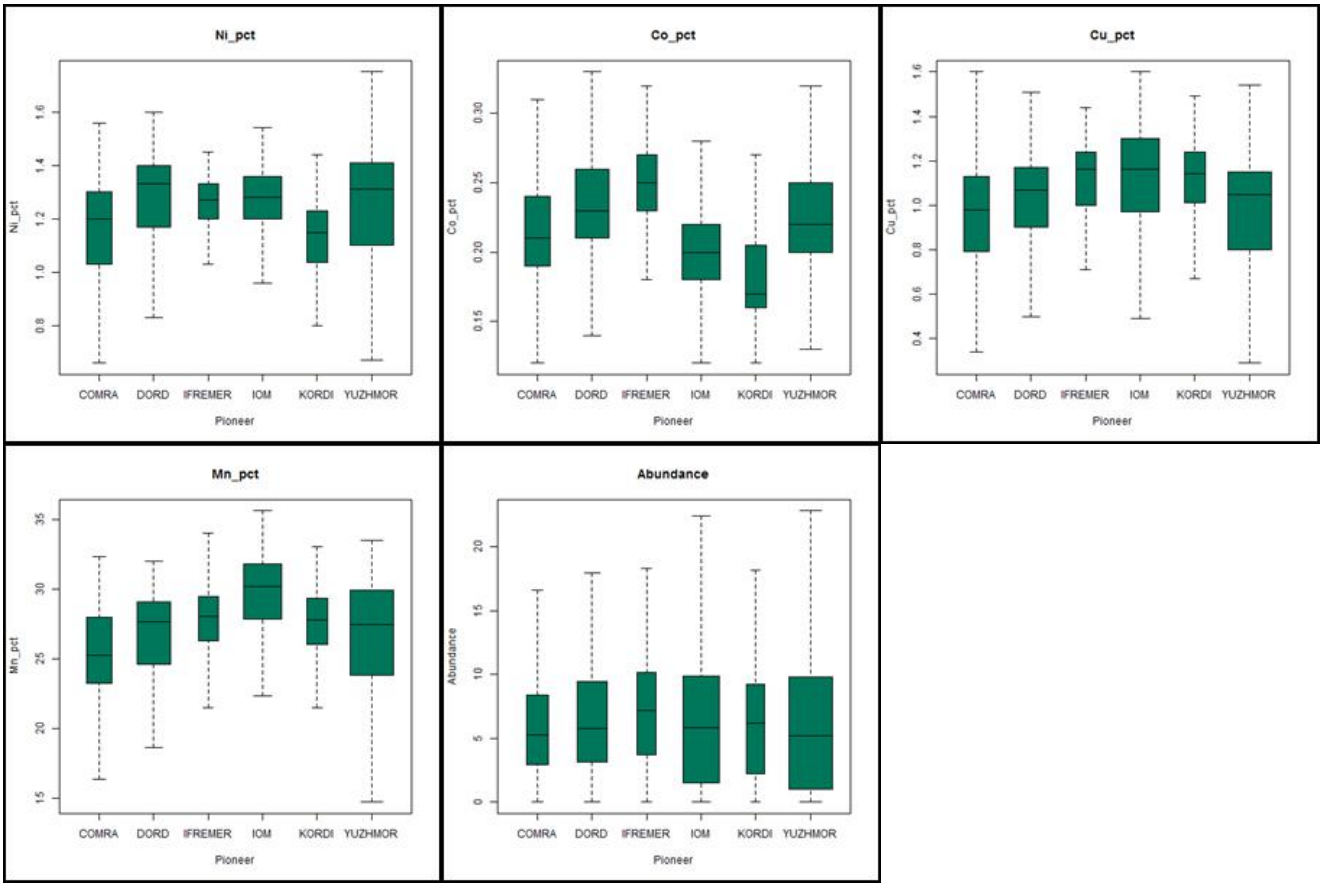
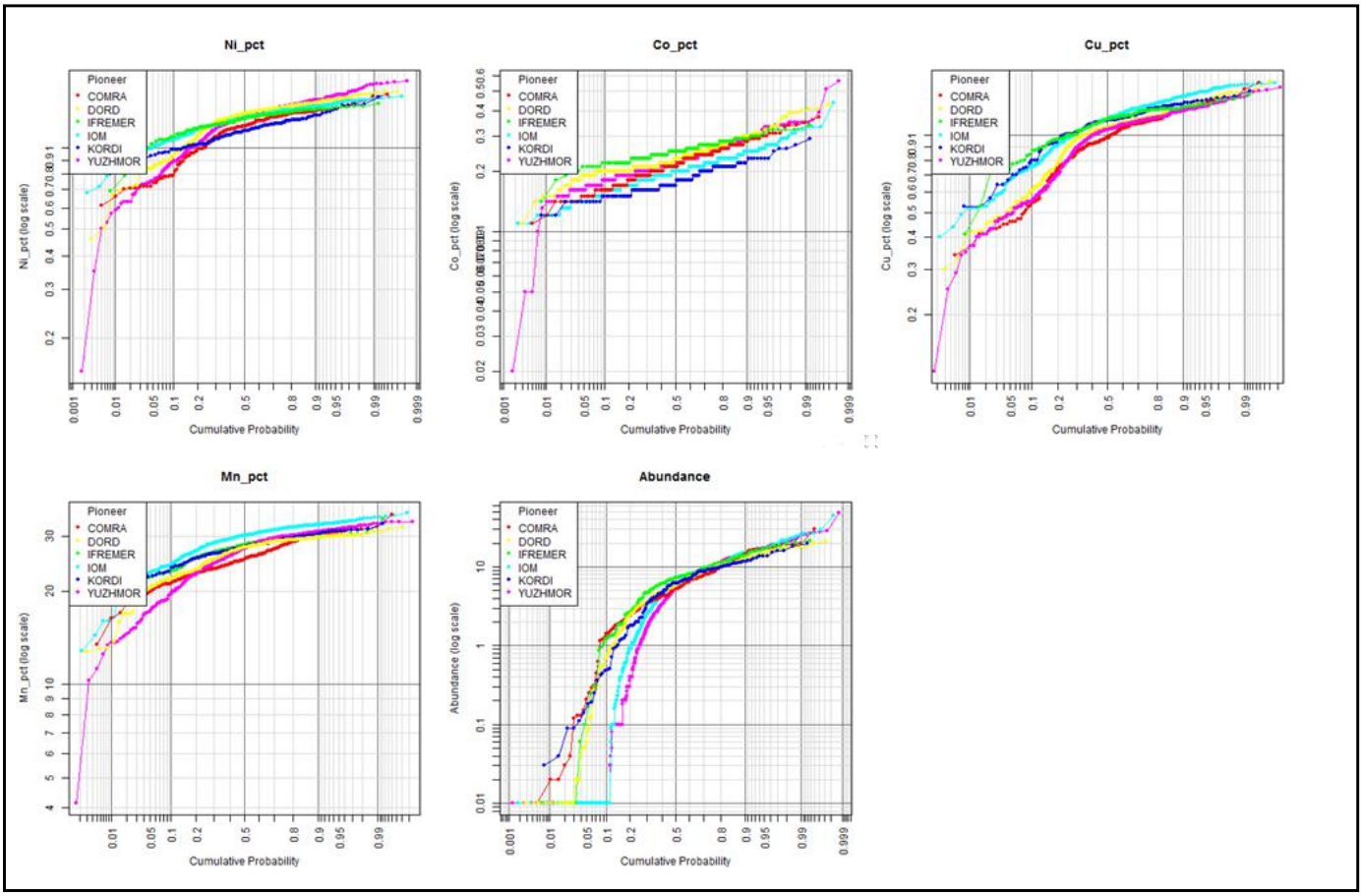


Figure 7.5 Log Probability plots comparing the 6 Pioneer Investor Data Sets.



7.1.2 Historical Sampling Method

Virtually all the historical samples used in the TOML Mineral Resource estimates were obtained by FFG samplers plus a few by BC samplers. Research has shown that free fall grab samplers consistently underestimate the actual abundance (Hennigar, Dick and Foell, 1986), but even today they are the most productive tool available for the assessment of nodule abundance. This is because a number of them can be deployed at any one time from the survey vessel allowing an order of magnitude increase in collection efficiency, i.e., approximately 10 to 20 samples per day for a FFG, versus about three samples per day for a BC that is winched to and from the seafloor.

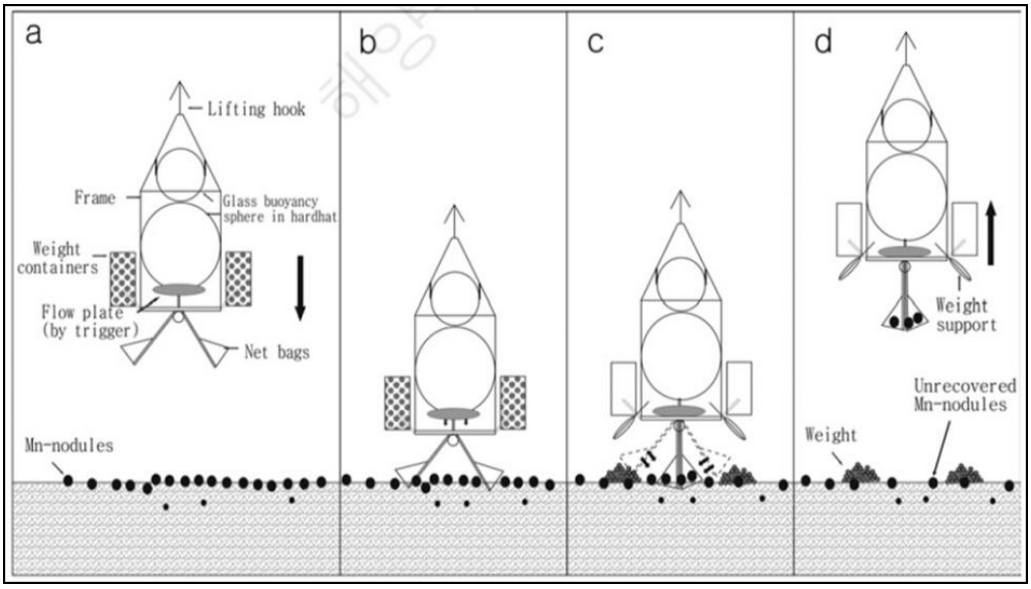
Lee et al. (2008) compared FFG and BC data in some detail. They found a wide range but consistent differences with FFG under-reporting compared to BC (Figure 7.8). They also illustrate why BC results should be much more accurate than FFG results based on mechanical effectiveness (Figure 7.6, Figure 7.7). They then recommend an overall correction factor of 1.4 to convert a FFG abundance to a BC abundance. However, they acknowledge that any simple factor lacks precision. One key issue is the size of the FFG or BC (area covered) versus the nodule diameter. Free fall grab samplers have been demonstrated to underestimate the actual abundance as smaller nodules may escape some grabs during ascent and larger nodules around the edge of the sampler may be knocked out or fall out during the sampling process.

No conversion has been applied to the TOML nodule abundance because:

- Sample collection type is not specified in the historical data (i.e. proportion and identity of BC versus FFG samples is unknown (although most are likely to be FFG).
- The size of collector and nodule sizes is not specified in the historical data.

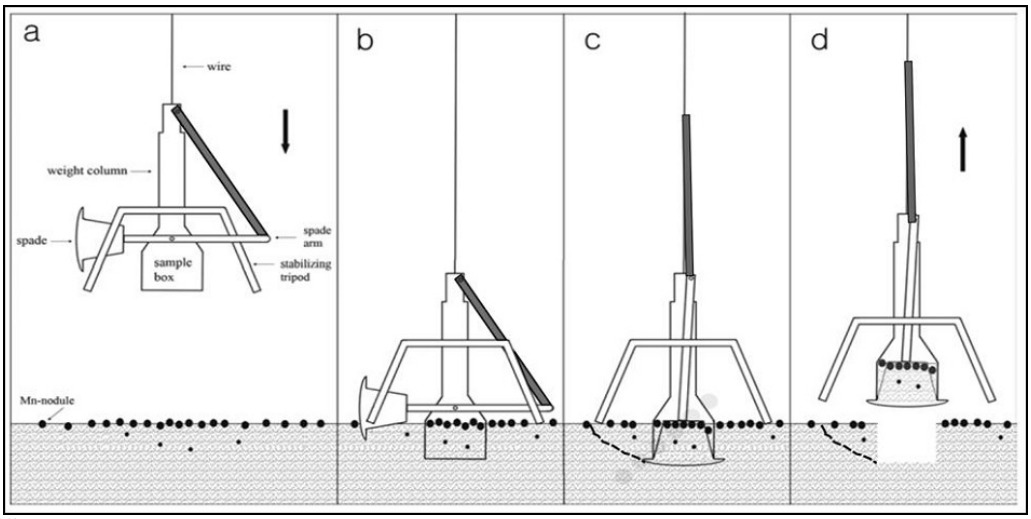
Therefore estimates of nodule abundance based on historical samples are likely to be conservative.

Figure 7.6 Cartoon showing the recovery process of nodules using Free Fall Grab



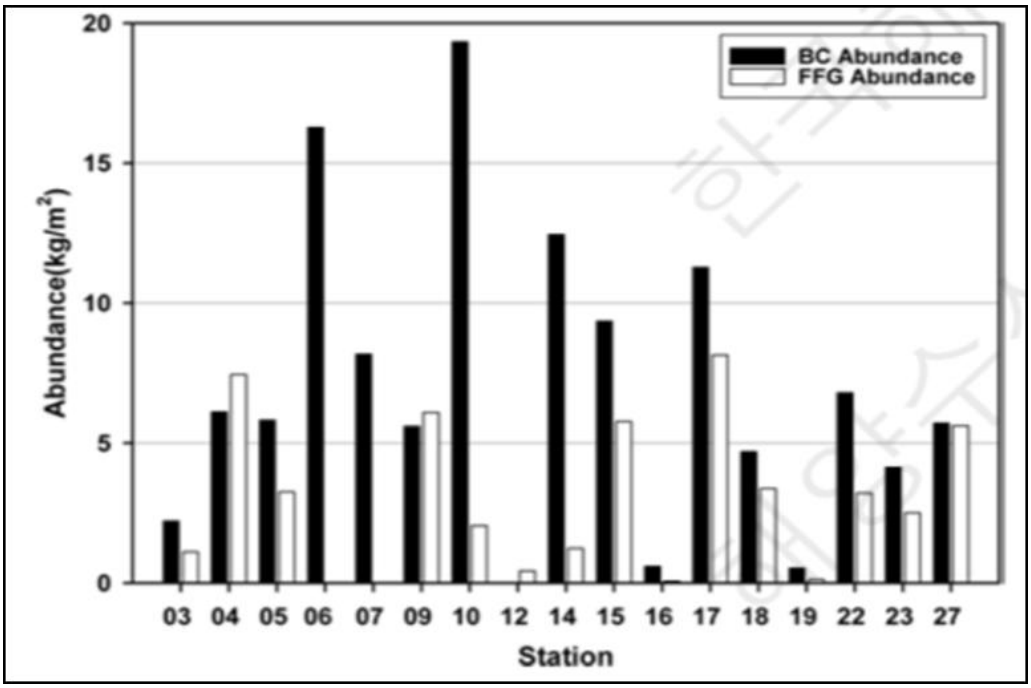
Source: Lee et al., (2008).

Figure 7.7 Cartoon showing the recovery process of nodules using Box Corer



Modified after: Lee et al., (2008).

Figure 7.8 Comparison of returned abundances from BC and FFG at test stations within the KORDI exploration area



Source: Lee et al., (2008).

Metal content in the historical samples was determined by a variety of standard analytical methods, including atomic absorption and X-ray fluorescence. Limited information is available on historical sample preparation and analytical methods. The various groups reportedly used polymetallic nodule Certified Reference Materials (e.g., NOD-P-1; Flanagan and Gottfried, 1980) for QAQC, however details of the Certified Reference Materials and analytical results were not included in the dataset supplied by the ISA to TOML and Golder.

7.2 TOML Work Programmes

In 2012, TOML realised the need for two campaigns to effectively define a mineral resource of sufficient confidence and size to likely support the building, commissioning and payback of a mining operation.

The first campaign in 2013 utilised the MBES system of the chartered RV Mt Mitchell (Figure 7.9) to map the seafloor in Areas B through F, as well as to test equipment and collect sufficient sample to confirm grades and support metallurgical test work.

The second campaign in 2015 used the experienced team and equipment spread on the RV Yuzhmorgeologiya (Figure 7.9) to sample and image mapped priority areas so that a higher confidence and expanded mineral resource could be estimated, and to collect environmental baseline and geotechnical data.

Figure 7.9 RV Mt Mitchell (CCZ13) and RV Yuzhmorgeologiya (CCZ15)

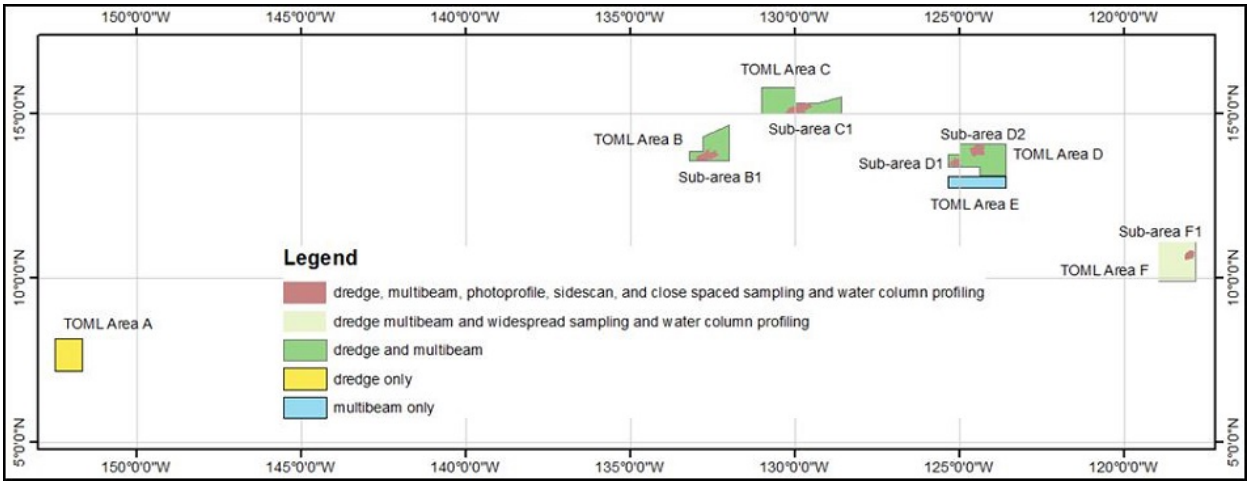


Table 7.7 and Figure 7.10 summarise collected data from each TOML area and sub-area. MBES (12 kHz MBES echosounding) includes bathymetric and backscatter products and geological geomorphological interpretation. Photo-profile includes still and video products and logging. Dredge sample data includes grade characterisation and some size distribution data. Water column includes temperature, pressure, turbidity and in some cases physical samples and current. Box-core data includes nodule grade and abundance; fauna, and in some cases vane shear and/or sediment characterisation. Deep-tow sonar includes sidescan sonar, sub-bottom profiler and micro survey and altimetry.

Table 7.7 TOML datasets by area and by campaign

	MBES km^2	**Photo-profile line km**	**Dredge #**	**Water column #**	**Box-core #**	**Deep Tow Sonar line km**
Area A	–	–	2 CCZ15	–	–	–
Area B	9,966 CCZ13	–	–	–	–	–
Sub-area B1	Included in B	178 CCZ15	1 CCZ13	14 CCZ15	30 CCZ15	88 CCZ15
Area C	15,763 CCZ13	–	–	–	–	–
Sub-area C1	Included in C	231 CCZ15	1 CCZ15	14 CCZ15	16 CCZ15	32 CCZ15
Area D	15,881 CCZ13	92 CCZ15	6 CCZ13	–	–	–
Sub-area D2	Included in D	47 CCZ15	2 CCZ13	26 CCZ15	26 CCZ15	120 CCZ15

Figure 7.10 Extent of TOML exploration in the CCZ



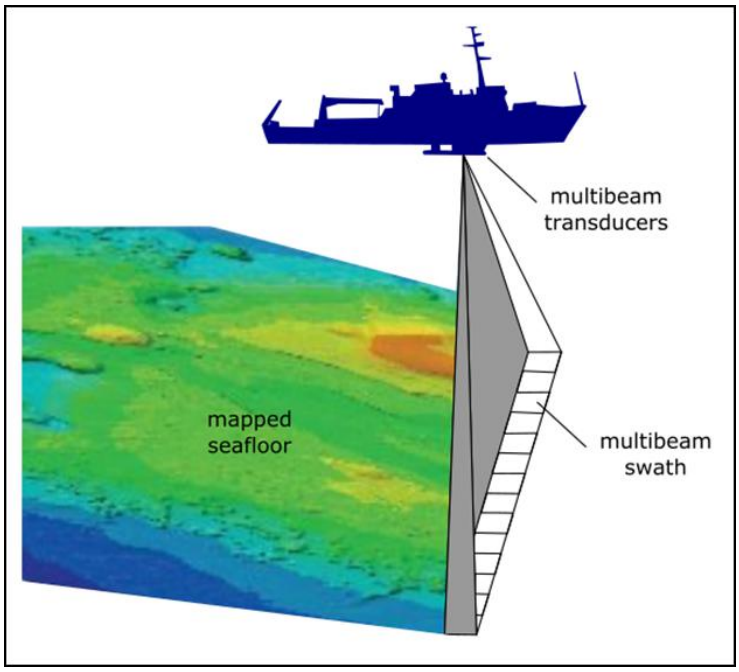
7.3 TOML Sampling Methods

Details of key resource data collection processes and methods are presented here.

7.3.1 Multibeam Bathymetry

MBES is used to determine the depth of water (bathymetry) and the acoustic reflectance (backscatter) of the seabed. It operates by transmitting a focused acoustic pulse (Figure 7.11) from a specially designed transducer across a swath across the vessel track. These pulses return as a set of receive beams that are weaker and narrower and whose arrive time varies depending on speed and distance. Thus position and depth can be measured and seafloor hardness can be qualitatively assessed.

Figure 7.11 MBES operations schematic



During the CCZ13 campaign the RV Mt Mitchell operated a hull mounted Kongsberg EM120 MBES over areas B through F. This equipment operates at 12 kHz and is capable of operation up to 11,000 m water depth. It has better than 5 m vertical resolution and ~60 m horizontal resolution for bathymetry and ~30 m for backscatter at water depths between 4,500-6,000 m. It has a maximum swath width of 6 times the water depth but the effective swath width varies from 2 to 6 times the water depth depending on the depth, sea state and heading.

The only pre-existing bathymetric data over the TOML tenement areas (excluding occasional widely spaced transit lines collected by research vessels) was the Sandwell and Smith based, satellite bathymetry (BODC, 2014). This bathymetry is calculated using mean sea levels to estimate depth to seafloor and is good for a resolution of 30 arc seconds (within the TOML areas this roughly equates to 900 m). In a general sense, this data is usually accurate to within a hundred metres vertically, but it lacks the definition necessary to define the smaller seamounts, ridges and smaller bathymetric features. No publicly available backscatter or seafloor reflectance data exists for these survey areas. As a result, conducting these MBES surveys provides TOML with a significant improvement in the vertical and horizontal resolution of the bathymetry, and with unprecedented intensity definition of the backscatter, resulting in visibly crisper, and much more interpretable imagery.

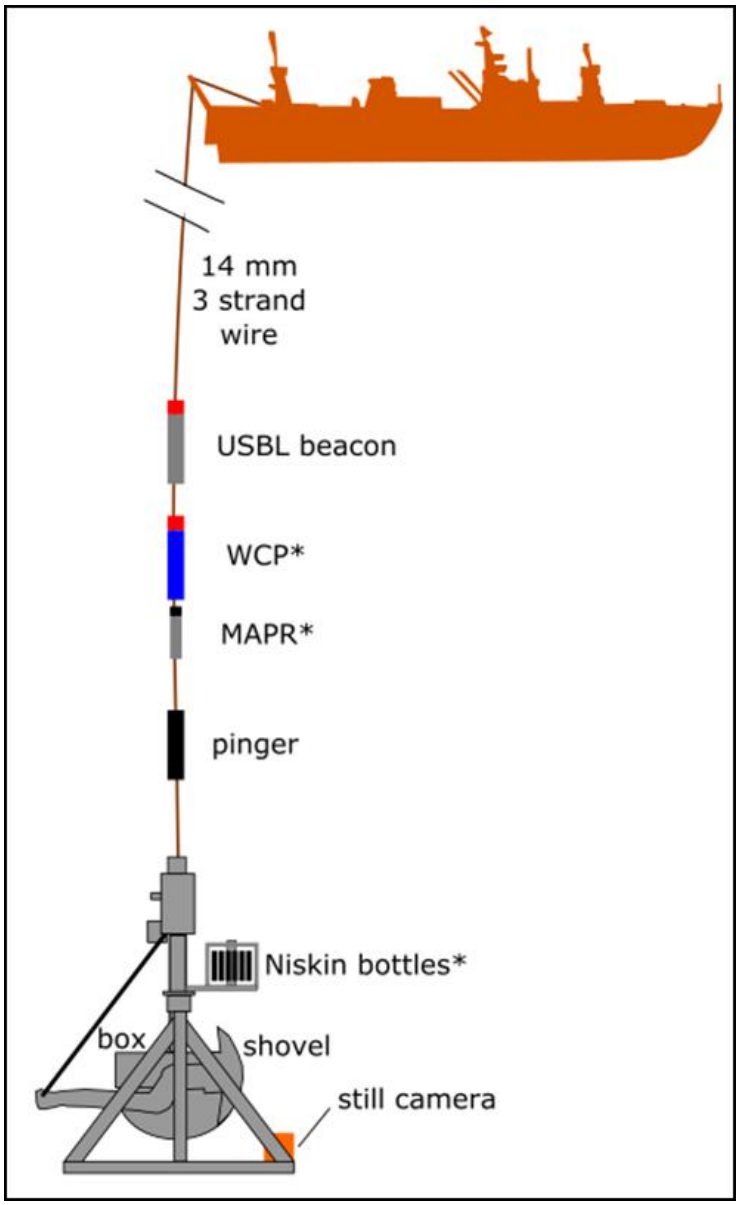
CTD (conductivity-temperature-depth) soundings were performed at each of the survey areas in 2013. The primary reason for this is that the MBES system requires an accurate full water column sound velocity profile with which to perform real time beam steering and location calculations.

7.3.2 Box-coring

Box-coring was undertaken in 2015 to collect samples for mineral resource estimation, to collect biological samples for environmental base-line measurement and to collect geotechnical data. Box-core operations adhered to the following:

- Deployment and recovery off the stern of the vessel using three strand wire and the vessel's starboard hydrographic sample winch (Figure 7.12)
- The vessel maintained minimum forward speed, typically 0.3 to 0.7 knots into result (combination of surface wind and waves)
- The box-core's progress and status (fired or not) was tracked using a signal from a 12 kHz pinger
- Landing points were within 500 m of the planned grid co-ordinates (as per Dive Plans) with the following pre-conditions:
  - Landing points avoid steeper areas (>10° slope) based on pre-existing multi-beam bathymetry
  - The hydrographic surveyors guiding the landing never sight the backscatter product of the existing multi-beam coverage (to eliminate chance of sighting bias)
  - USBL navigation provides location to within ±15 m.

Figure 7.12 Box-corer Deployment Schematic



7.3.3 Box-coring Overview

Box-corers have been used in the CCZ since the 1970s. As they collect a seabed sample effectively intact (Figure 7.7), they are seen by most workers as the best possible sampling device to estimate the nodule abundance in any given area. As such, the box-core samples were the most important contributor to the CCZ15 campaign results and by extension, to an independently validated, mineral resource estimate.

Box-corers come in different sizes: typically 0.1 m^2 or 0.25 m^2 (plan area of sample box or tube), but box-corers of 0.75 m^2 and 1 m^2 have also been used.

Smaller box-corers are good for micro-biological sampling of the epibenthic zone and are adequate for the estimation of abundant nodule resources, especially those involving smaller nodules. For accurate estimation of the abundance of larger nodules, especially in lower quantities, larger box-corers are more accurate.

The largest box-corers used in the CCZ were 1 m^2 (Afernod's Sympas system and one built by the OMCO consortium), but by all accounts, these were very large and difficult to handle. Kennecott built a 0.75 m^2 corer and used it extensively, deeming it to be an effective compromise (Felix, 1980).

7.3.4 Box-corer Equipment

Two types of box-corers were used during the TOML CCZ15 campaign:

- 0.75 m^2 box-corer manufactured by KC Denmark (80.740 code) and supplied by Nautilus Minerals (Figure 7.14). For part of the campaign, the KC box-corer included a carrousel of 12 small volume (300 ml) Niskin bottles for water sampling. Each side of the box has an internal width of just below 87 cm (there are minor variances of 1–2 mm with the corner welds), so the true area of 7569 cm^2 is used for the abundance estimation.

- 0.25 m^2 box-corer manufactured by YMG (Figure 7.15) based on a USNEL/Scripps design from the 1970s.

Figure 7.13 Details and operations with the KC box-corer

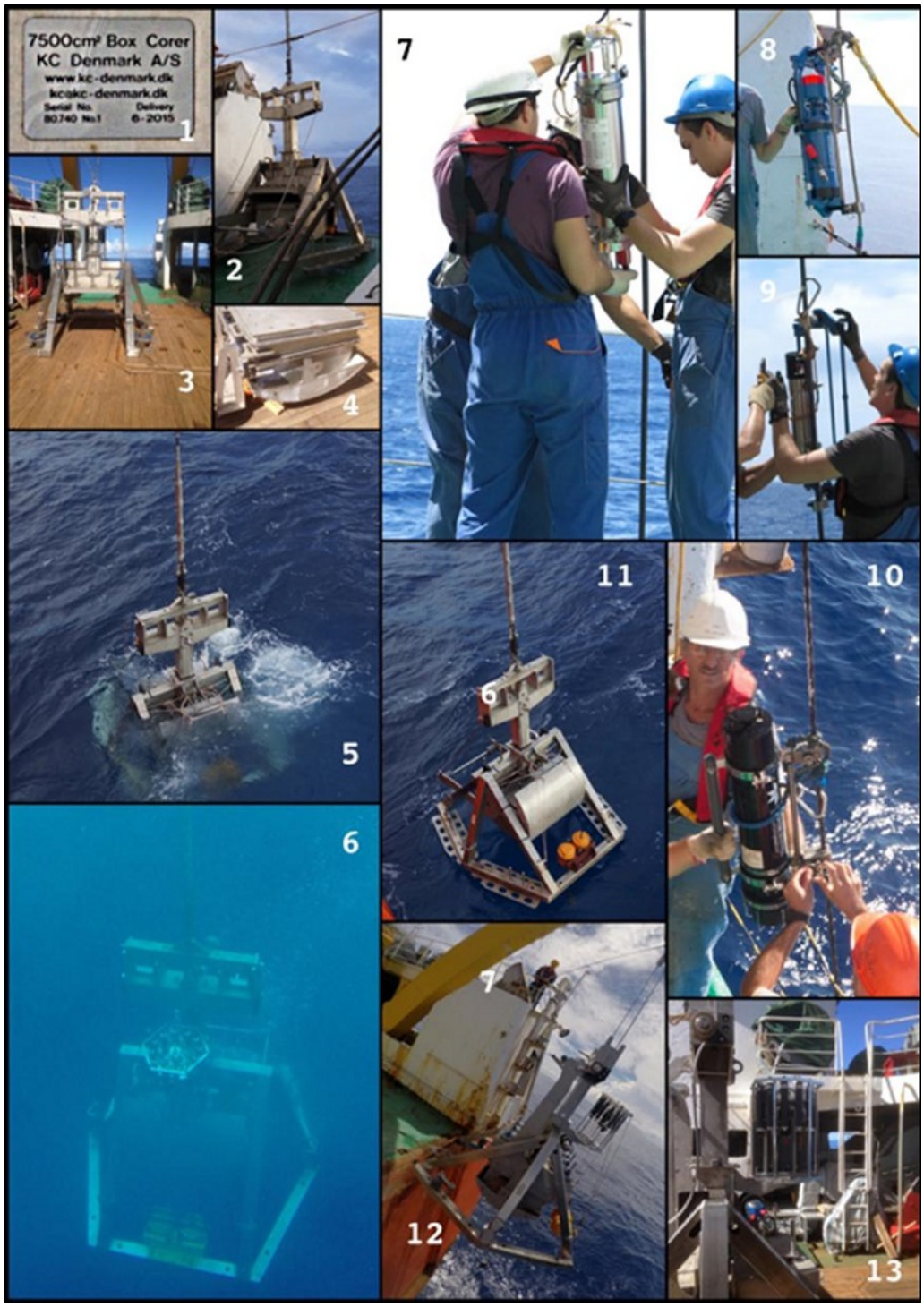


Figure 7.14 Details and recovery of the YMG box-corer



7.3.5 Nodule sampling

Logging was completed manually by the Lead Scientist on shift. The manual logs were scanned and then transposed into MS Excel.

All weights were taken using a Wedderburn Marine motion compensated scale (WM42; Serial number #3380724) that was checked and calibrated in Brisbane, Australia, before shipping to the vessel. The scale has a 40 cm x 40 cm plate with vessel motion recorded and corrected electronically. Scales are claimed to be accurate to 60 kg ± 50 g, which was as observed during the campaign. The scales were checked using 12×1.5 litre or 12×2 litre water bottles and recorded weights were consistent with the mass of water plus packaging.

Upon arrival on deck, the nodules were photographed in situ, removed from the box and weighed three times:

- 1st time with mud still attached (preliminary weight) to enable biological analysis
- 2nd time after washing in filtered salt water (washed weight)
- 3rd time several days later and after exposure to 30–90 minutes in air conditioning and removal of ponded or sweated free water (aired weight).

Note that at each stage of handling, despite due care, some attrition of the nodules occurred with loss of a small (generally <1%) of fine material (dust to sand sized). The bulk of this loss occurred at the washing stage, but it was noticeable at the aired stage as well. The rate of attrition varied by nodule type (rough nodules broke up more) and by area (the rough and smooth rough nodules in the southern part of Area F were especially soft).

The difference between the washed and other weights is illustrated below in Figure 7.16. There is almost no difference between the washed and aired weights (average for all samples over 1 kg is –0.87%; in Area F it is –1.86%), with the cause of the minor differences debatable (moisture or attrition).

Figure 7.15 Preliminary vs. washed vs. aired box-core nodule sample weights (kg)

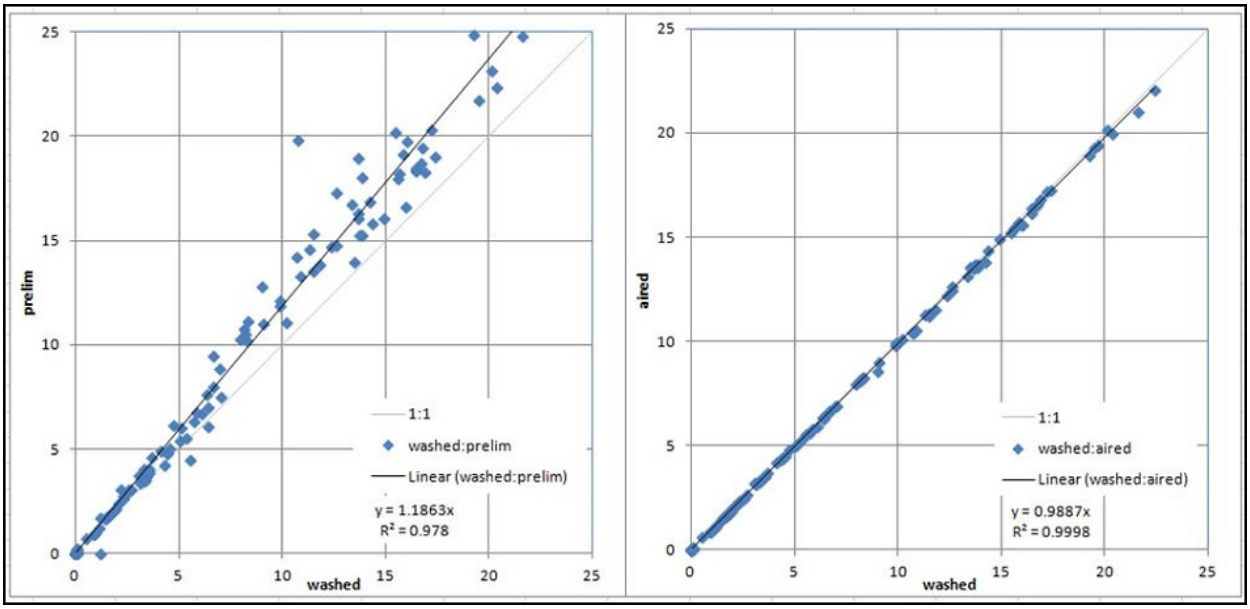
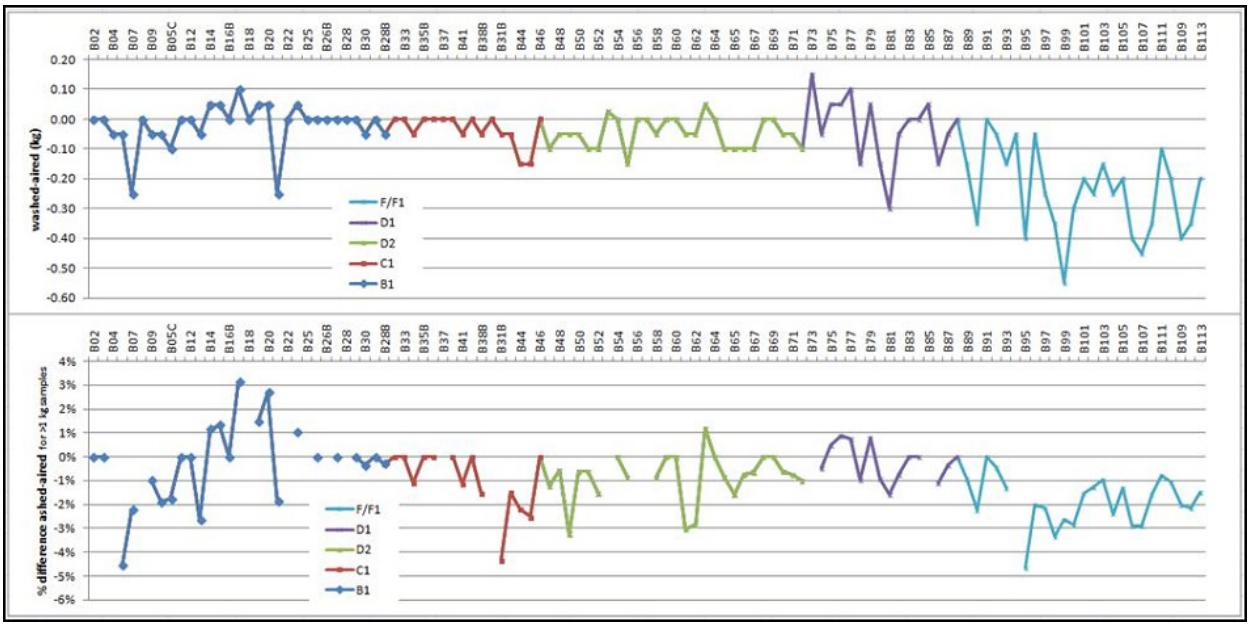


Figure 7.16 Differences in washed vs. aired box-core nodule sample weights by area



Handling of nodules was at all times supervised by the Chief or Lead Scientists, who were also the only people permitted to weigh the nodules, record the weights and seal bags and pails for transport. Nodule sampling was managed as follows (refer Figure 7.17, Plates 1 to 24):

- From the box, nodules were removed to the weighing station (in the geology laboratory or adjacent to the box-core landing spot on the back deck; (Plates 8 &13)
- Here, preliminary weight was taken and recorded, the nodules were washed, firstly the selection with observed fauna, then the rest of the nodules.
- Then the washed weight was taken and recorded (Plate 14).
- Then the nodules were carried to the geology laboratory where they were arranged and photographed by a designated scientist before temporary storage in sealed plastic bags in a designated area.
- Then at the conclusion of sampling of an area (1-7 days after collection), the samples were laid out about 6-20 at a time for airing (Plates 21 & 22).
- After 30 to 90 minutes of airing, reference and duplicate samples were selected, re-packed weighed again, sealed in plastic bags security tagged with tamper-proof tags or tape and then photographed (Plates 19 & 20).
- Then the nodules were packed into specially marked paint pails with tamper-proof tape (Plate 23).
- Duplicates were collected from roughly one in ten samples. Subsamples were taken using cone and quartering.
- Pails were then transported (escorted by Chief or Lead Scientist) to a refrigerated container (reefer) on deck for transport to Brisbane, Australia, where the main assay laboratory is located (Plate 24).
- Reference samples were placed in specially marked and labelled pails for airfreight to Brisbane, Australia (in case of loss of the reefer in transit). These samples are for general reference purposes, but also serve as backup for chemical analysis. These samples were not sealed with security tags or tamper-proof tape.
- Duplicate samples were placed in specially marked containers and labelled for air-freight to Jacobs University, Bremen, Germany, where the check laboratory is located. These samples and all container pails were sealed with tamper-proof tape.

Figure 7.17 Details and operations regarding sample processing



7.3.6 Buried Nodules

In most samples, there were no buried (i.e. >10cm) nodules although some were occasionally entrained by the sides of the box or the shovel. If present, buried nodules were separated at the point of collection from the box and were washed, weighed, and packed separately. Entrained nodules were sampled for reference purposes only and were not weighed.

7.3.7 Vane Shear Readings

Vane shear was measured in all box-cores that returned with undisturbed sediment. A 33 mm vane on a calibrated hand held shear vane device was used. Measurement location and readings were recorded on the Box-core Sample Log Sheet then transferred to a spreadsheet.

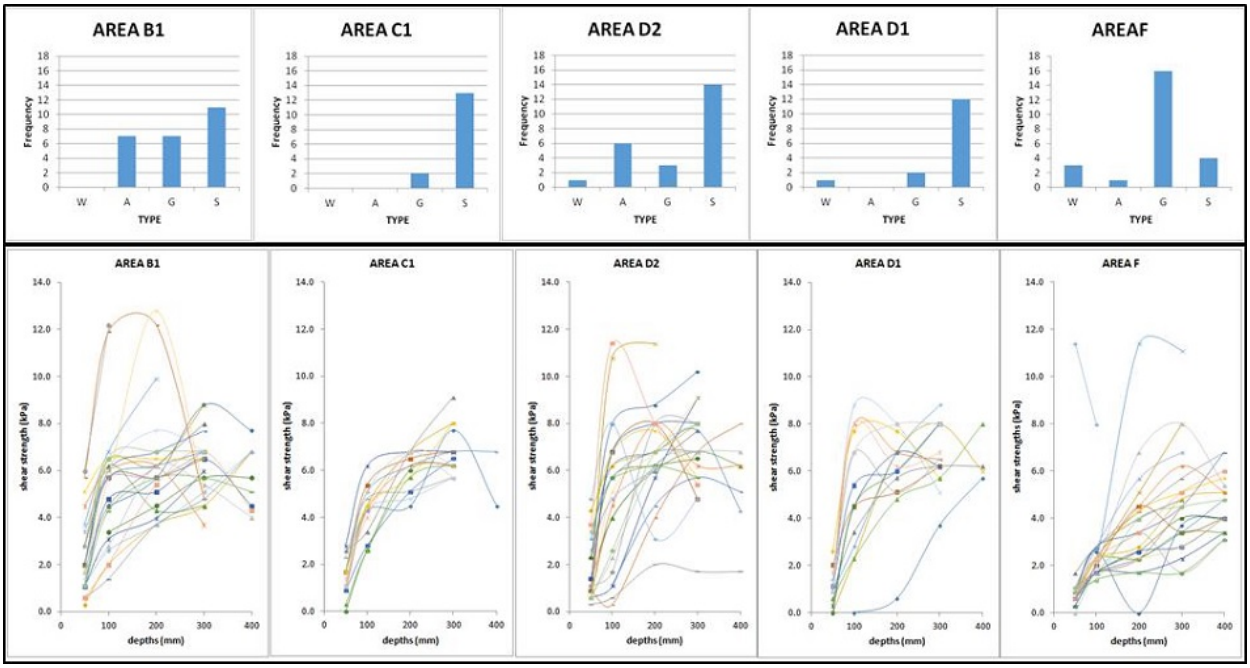
Vane shear was classified into one of four classes:

- W is mostly weak from top to base
- A is all stiff from top to base
- G is soft at the top with gradual stiffening with depth
- S is soft at the top with more sudden stiffening with depth.

Data were also reviewed by box and the most coherent reading selected. Averaging of readings was not undertaken as some measurements were taken in disturbed sediment, especially near the base. The most coherent readings were generally taken in the centre of the box.

Summary results are included in the maps further below, but the classes vary by area as shown in Figure 7.18.

Figure 7.18 Summary vane shear results from TOML CCZ15 study areas



These data shows clear differences in the uppermost part of the sediment between areas, with:

- Area C1 showing consistently suddenly stiffening ground conditions (mostly class S);
- Area D1 showing a slightly wider range to C1 including some more rapidly stiffening situations (mostly class S);
- Areas B1 and D2 have a wider range of conditions and both areas have occurrences of sediment drift (Nnoo);

- Area F (and F1) has a universally weak upper layer then generally and gradually stiffens (mostly class G).

7.3.8 Biological-Sediment sampling

Biological-sediment base-line samples were collected from the majority of box-core samples. These samples were collected in accordance with ISA Technical Study: No.10 “Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals”. If TOML is to proceed to trial mining/full scale mining, these samples will play a key role in the environmental impact assessment of the proposed mine site(s).

Samples were collected to obtain an understanding of the in-fauna and epi-benthic community composition and sediment characterisation within the TOML tenement areas. A variety of sample types were collected from each box-core, which were fixed and preserved separately for morphological and molecular taxonomy.

Sample types collected and planned analysis:

- Overlying water fauna
- Megafauna (animals greater than 2 cm)
- Nodule fauna
- Micro-fauna (animals smaller than 32 µm)
- Meio-fauna (animals greater than 32 µm and less than 250 µm)
- Macro-fauna (animals greater than 250 µm and less than 2 cm)
- Sediment chemistry
- Particle size distribution
- Special core samples. Sample type collected occasionally to capture unusual sediment characteristics of interest in their original sediment layers.

Collection method, fixing and preservation are illustrated in Figure 7.19 to Figure 7.23. Biological-sediment samples were only collected if the box-core sample was in relatively good condition. If the box-core sample was damaged during collection, or recovery resulting in the mixing of sediment layers, most sample types were not collected. Biological-sediment samples were collected in conjunction with nodule samples. However, care was taken to minimise the mixing of sediment layers during the extraction of nodules.

Between sampling events, all sampling equipment was washed thoroughly using 25 µm filtered seawater to prevent contamination of samples. Sterilised Nalgene sample containers and Whirl-Pak sample bags were used to collect samples. During the collection of sediment chemistry samples, no equipment containing metal was used in order to prevent cross-contamination due abrasion and to trace level analyses.

The following are the essential operations undertaken to collect all samples types listed above. Figure 7.17 displays the order of sample collection and processing:

- Upon retrieval of the box-core to deck and delivery of the box-core samples to science team, overlying water was siphoned off into clean pails using plastic tubing and large pipettes. The water was then poured through a 32 µm sieve and the contents collected and fixed/preserved in 99% ethanol. (Figure 7.17 – Plates 5 & 6)
- Visible mega-fauna were collected from the surface of the sample using forceps, placed in a sample container and preserved. After preliminary weighing of the nodules, selected nodules were washed over a sieve (32 µm) and the contents of the sieve collected and fixed/preserved in 6% formalin or 99% ethanol. Large mega-fauna attached to the nodules were photographed before being removed from the nodule
- The required amount of 5 cm and 10 cm PVC cores were pushed into a box-core sample to a depth of over 20 cm. Rubber bungs were then inserted into the cores (Figure 7.17 – Plates 10 & 11)
- Residue samples were collected using heavy-duty geological sample bags (Figure 7.17, Plate 12),

- PVC cores were extracted from the box-core and placed upright in pails to prevent mixing of layers. Cores were washed to prevent contamination during processing
- PVC cores were analysed either for fauna type or for sediment characterisation, using horizon measurers and core cutter (Figure 7.17 – Plates 15, 16, 17 & 18):
- Micro-fauna (2 x 5 cm diameter cores) — 0–2 cm, 2-5 cm and 5-10 cm horizons were extracted, placed in the appropriate Nalgene sample container and fixed/preserved in 99% ethanol
- Meio-fauna (4 x 10 cm diameter cores) – 0-2 cm, 2-5 cm and 5-10 cm horizons were extracted, placed in the appropriate Nalgene sample container and fixed/preserved in 4% formalin or 99% ethanol
- Macro-fauna (4 x 10 cm diameter cores) – 0-2 cm, 2–5 cm, 5–10 cm and 10–20 cm horizons were extracted and sieved (250 µm). The contents of the sieve placed in the appropriate Nalgene sample container and fixed/preserved in 6% formalin or 99% ethanol
- Sediment chemistry – 0-2 cm, 2–5 cm, 5–10 cm and 10–20 cm horizons were extracted and placed in sterilised Whirl-Pak sample bags
- Particle size distribution 0-2 cm, 2–5 cm, 5–10 cm and 10–20 horizons were extracted and placed in sterilised Whirl-Pak sample bags
- Duplicate samples – were collected
- All samples collected were labelled using the q-Core database, following a pre-determined sample numbering system
- After fixing/preservation, all samples were packed into pails and stored in a refrigerated container kept at 2–4 °C (Figure 7.17– Plate 24)
- Samples fixed in 4% and 6% formalin were transferred to buffered 99% ethanol after approximately two weeks for long-term storage and preservation.

The bulk of the samples collected were shipped to Nautilus Minerals in Brisbane, Australia. A selection of overlying fauna, nodule fauna, meio-fauna, macro-fauna and mega-fauna have been shipped to YMG, Gelendzhik, Russia for expert morphological taxonomic identification. Sediment chemistry and particle size distribution samples were sent to SGS, Cairns for analysis. The bulk of the fauna samples will be stored until they can be analysed in accordance with a yet to be scoped environmental impact statement project.

Figure 7.19 Sample Plan – Overlying fauna and nodule

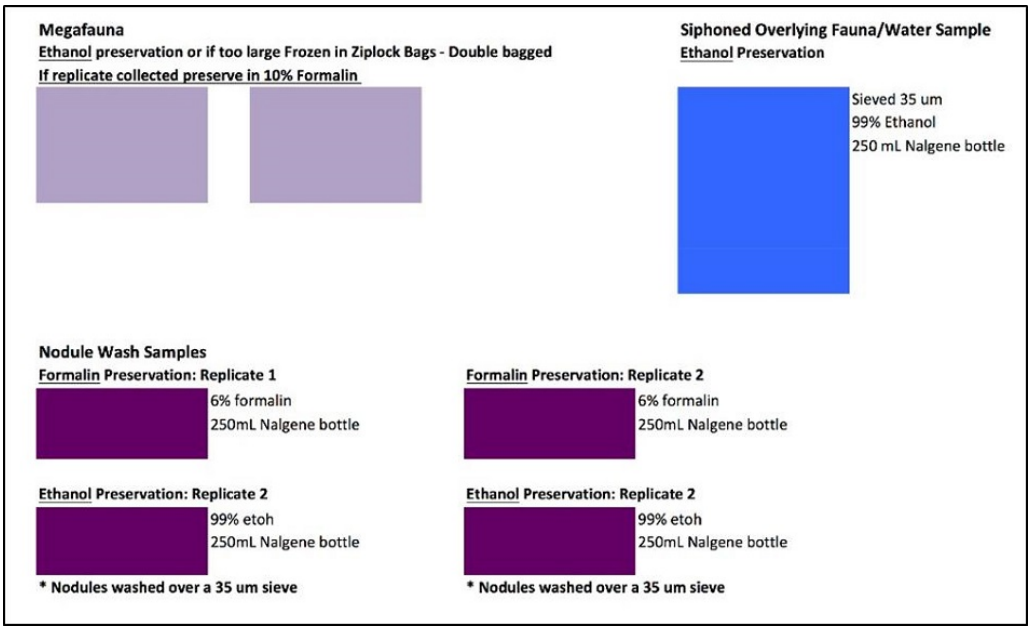


Figure 7.20 Sample Plan – Micro-fauna and box-core layout

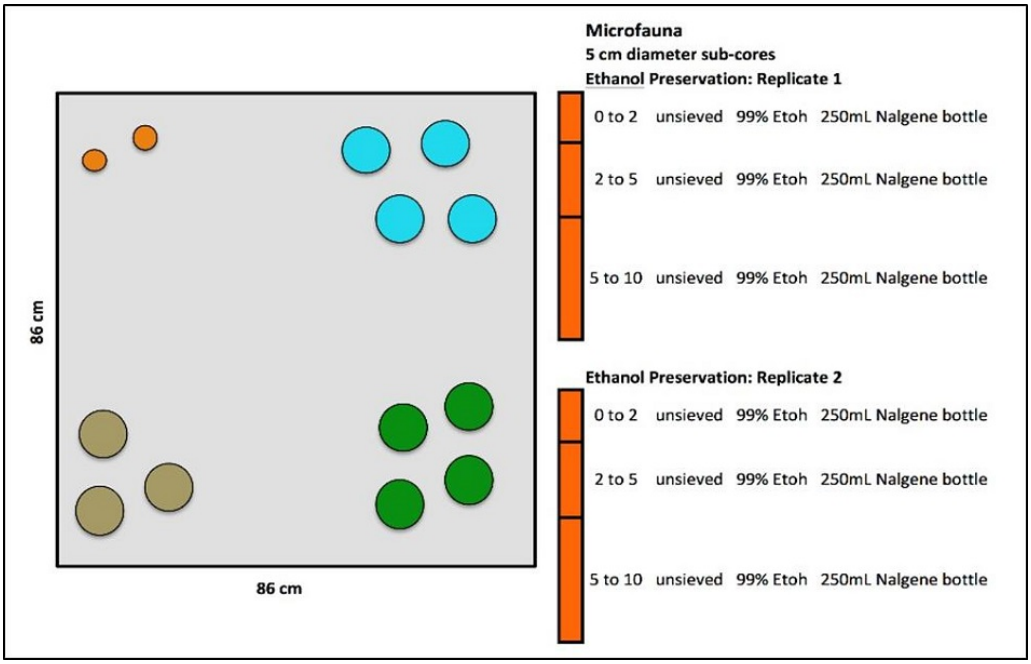


Figure 7.21 Sample Plan – Meio-fauna

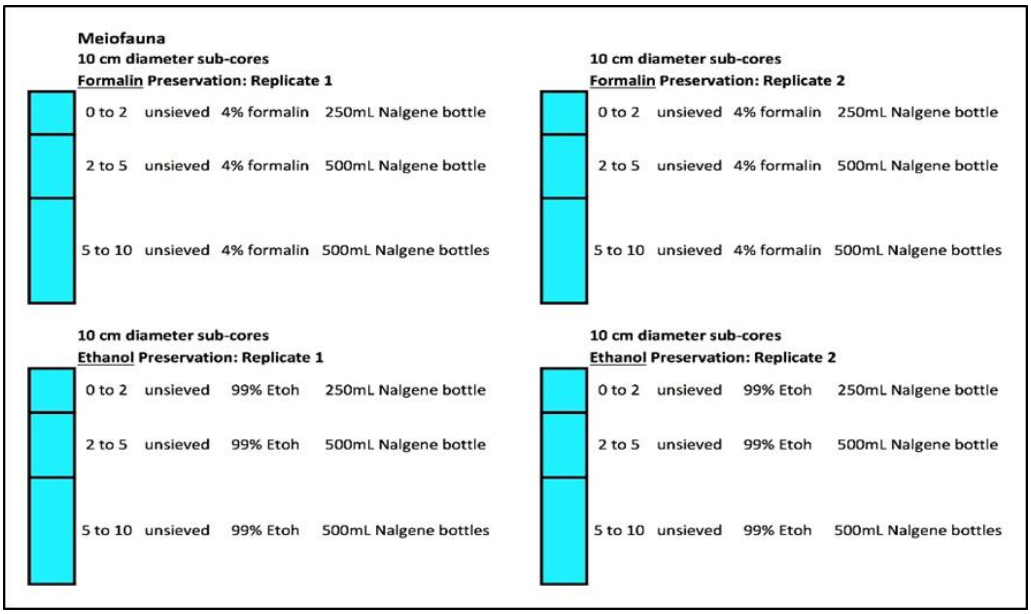
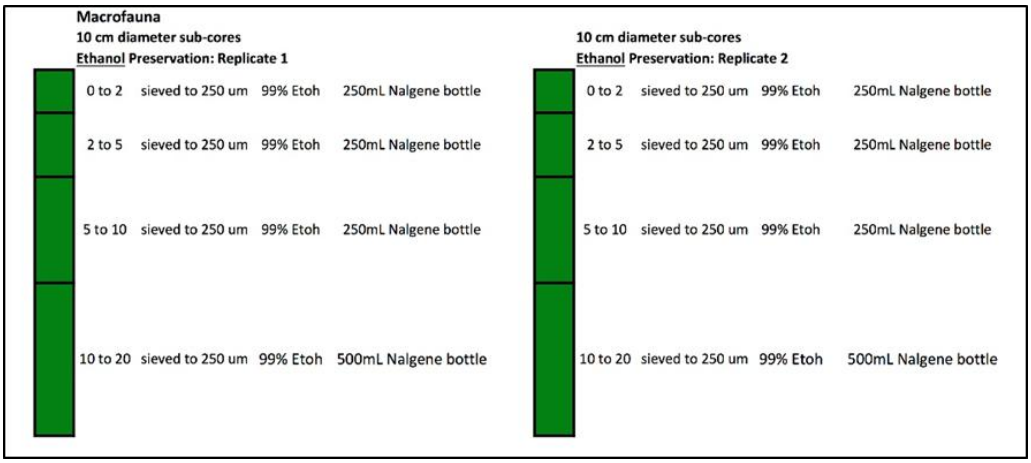


Figure 7.22 Sample Plan – Macro-fauna



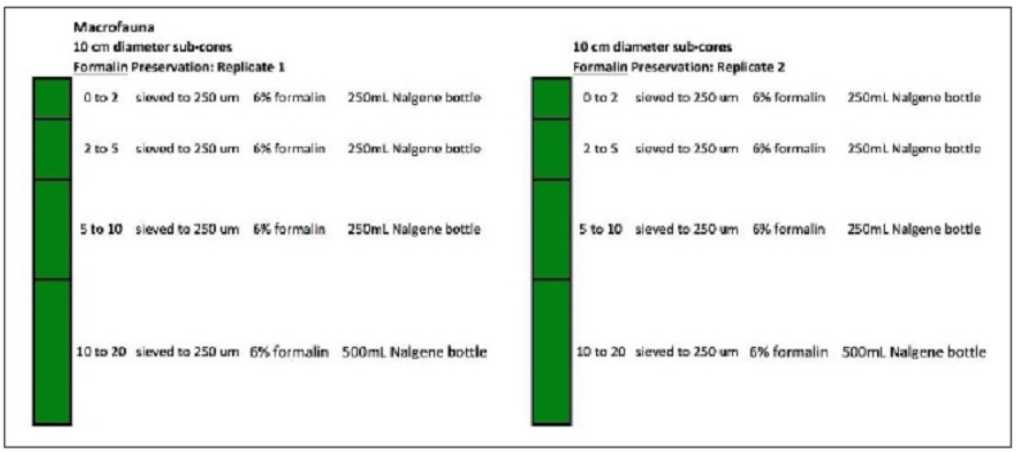
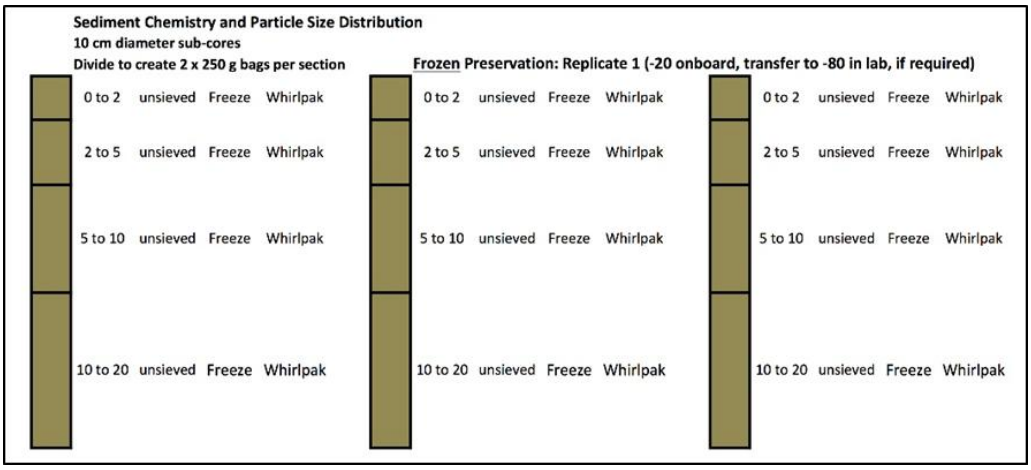


Figure 7.23 Sample Plan – Sediment characterisation



7.3.9 Sediment residue sampling

Most box-cores with good returned sediment had three samples taken after all other sampling was complete:

- Top sample was typically 0–5 cm and comprised any remaining semi-liquid layer and geochemically active layer. Typically very soft and selected by this characteristic.
- Second sample was of more solid sediment typically taken at 5–20 cm.
- Third sample was remaining to base of box, usually a further 10–20 cm down, depending on depth of penetration.
- Each sample weighed between 5 kg and 25 kg and in total about 330 samples were taken, making this the highest volume-weight sample collected and shipped.
- The sediment was taken for use in future geotechnical/engineering studies (e.g., reconstruction for traction and nodule collection bench top trials) and for reference.

7.3.10 Water sampling

Water column samples were collected during CCZ15 as part of the environmental base-line characterisation of the TOML tenement areas in order to meet the recommendations per the ISA document; Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals. Samples were collected via the Niskin bottle rosette attached to the box-corer (Figure 7.13, Figure 7.24). The Niskin bottle rosette contained 12×300 ml Niskin bottles, which were triggered using a pressure sensor. Samples were collected for both infield and on-shore laboratory analysis.

Water sample types collected were:

- Total Metals (TM) - 125 ml sterilised Nalgene container – 1 ml of nitric acid added for preservation (on-shore analysis);
- Total Suspended Solids (TSS) - 1 L sterilised container (on-shore analysis);
- pH and Oxidation-Reduction Potential (ORP) - In-field measurements – approximately 150 ml required to obtain measurements.

The water sampler (Niskin rosette) was programmed with the selected depth strata for full water sampling programme conducted in Area C, D and F and the Niskin bottles set to the open position, each time before deploying the box-core. The water-sampling programme was designed to collect samples from varying depth strata across all areas where box coring was conducted.

Depth strata sampled for the majority of samples collected were:

- 50 m
- 200 m
- 500 m
- 1,000 m
- 1,500 m
- 500 m from the seafloor
- 100 m from the seafloor
- 50 m from the seafloor

Upon recovery of box-core and Niskin rosette to deck, the Niskin bottles were processed depending on the sample type being collected. TM and TSS were collected using the appropriate sterilised sample containers and refrigerated at 4°C The pH and ORP samples were collected and taken to the water chemistry laboratory for analysis. Samples were analysed using YSI Pro10 handheld multi-probe with pH and ORP sensors. A three-point calibration was conducted on the pH sensor prior to every sampling event.

Niskin bottles were fired during the decent due to the limitations of the device, as there was no way of programming the device to delay firing at the set depth strata on ascent. To minimise the risk of contamination from residue left from previous sample, the box-core was washed out between deployments. Due to commissioning issues the water sampler was not operational until Area C. Therefore, water samples were only collected in Area C, D and F.

All water samples collected for laboratory analysis were priority hand-carried back to Brisbane and shipped to SGS Cairns for analysis.

Figure 7.24 Water Sample Collection and Water Chemistry Laboratory



7.3.11 Water column profiling

During CCZ15, water column profiles were collected as part of the environmental base-line characterisation of the TOML Areas in order to meet the recommendations per the ISA document: Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals. The majority of water column data were collected via a Mini Autonomous Plume Recorder (MAPR) with the following sensors:

- Temperature (°C);
- Turbidity (NTU);
- Depth (m).

The MAPR was deployed during most operations by attaching it to either the box-core cable (50 m above the box-corer) or the umbilical of the MAK (side-scan) or Neptune (photo-profiler) at 50 m above either instrument, see Figure 7.13-Plates 7 & 9. Upon recovery of the MAPR to deck, these data were downloaded and processed and Excel template.

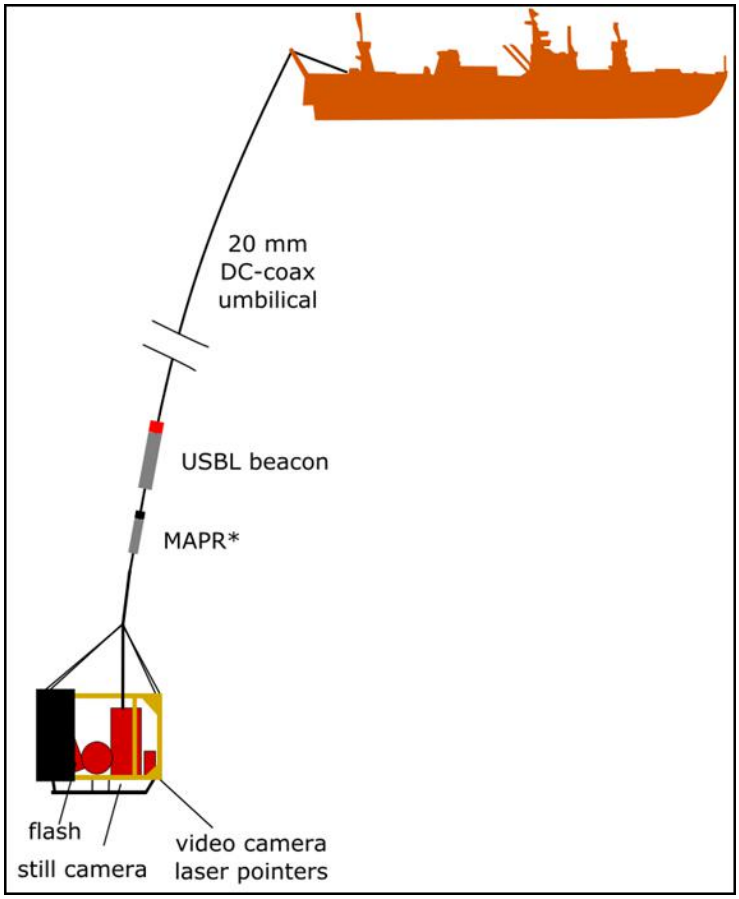
Along with the MAPR, an Aanderaa Seaguard single-point current sensor was deployed on a select number of box-core deployments in Area F.

7.3.12 Photo-Profiling Programme

Photo-profiling was undertaken to provide data on short range continuity of nodules and visual based estimates of nodule abundance for mineral resource estimation. It also provided a census of mega-fauna and macro-fauna for environmental base line measurement and habitat mapping. Finally, it helped calibrate MBES and deep towed sonar results in terms of understanding seafloor rugosity.

Deployment and recovery of the camera was off the stern of the vessel using an umbilical and the vessels aft tow winch (Figure 7.25). The system was deployed just above the seafloor with the winch operator taking line in and line out to compensate partially for vessel heave. Video was streamed constantly to the vessel where it was logged by TOML team into the Nautilus Minerals' proprietary Nautical logging system.

Figure 7.25 Neptune Deployment Schematic



Photographs were taken automatically at a prescribed altitude of 3.5 m above the seafloor, a minimum.

30 seconds apart and continually uploaded to the vessel where scientists collected them from the central server and logged them for geology and biology. These were also subsequently logged by the TOML biologist in more detail.

Neptune lines were pre-planned to place the vessel into “prevailing result” where it maintained a forward speed of about 1.2 knots. As the line got longer, more line tended to be fed out and vessel speed tended to increase. Average velocities also tended to increase as the campaign progressed and the team optimised survey settings.

The system’s position was monitored using a 12 kHz USBL beacon except on line CCZ15-F08, where an estimate of position had to be made from line out and vessel position.

Hydrographic surveyor and bridge shared the same navigation display and the vessel was steered so that the profiles never moved more than 1 km off line and typically was well within 500 m of the planned line.

Survey data from the vessel, USBL location of the camera and attitude sensor was collected and subjected to preliminary analysis to learn more about towing dynamics.

Figure 7.26 Neptune Deployment Photographs



7.3.13 Deep Towed Sonar Programme

YMG's MAK-1M deep towed system was brought on the CCZ15 campaign primarily to map and characterise the seafloor bathymetry in detail via its 30 kHz side scan system. The system also provided useful data on seafloor composition from its 5 kHz sub-bottom profiler and on seafloor surface survey from its altimeter-USBL survey data.

Essential operation was as follows:

- Deployment and recovery of the sled and depressor was off the stern of the vessel (Figure 7.27, Figure 7.28).
- MAK lines were pre-planned to place the vessel into prevailing result where it maintained a forward speed of about 1.5 knots.
- The system's position was monitored using an integrated 12 kHz USBL beacon and altimeter.
- The system was towed behind a depressor weight about 100 m above the seafloor with slight elevation changes to follow the seabed. Speed of towing was limited by ping rate and data quality.
- Hydrographic surveyor and bridge shared the same navigation display and the vessel was steered so that the sled never moved more than several hundred metres off line.
- All processing through to delivered products was done on-board by the YMG MAK team.

As with the Neptune photo-profile systems, analysis of the sled versus ship position as well as some attitude/MAPR sensor data provided information on deep tow dynamics that might be of help in the design of future towed systems (e.g., for the Nautilus mining concept).

Figure 7.27 MAK Deployment Schematic

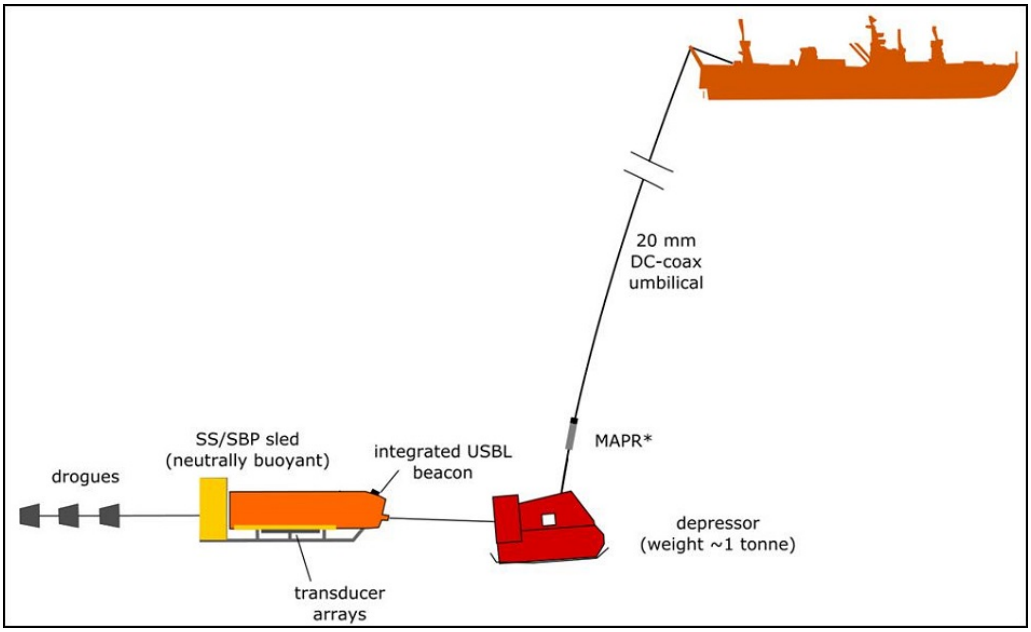
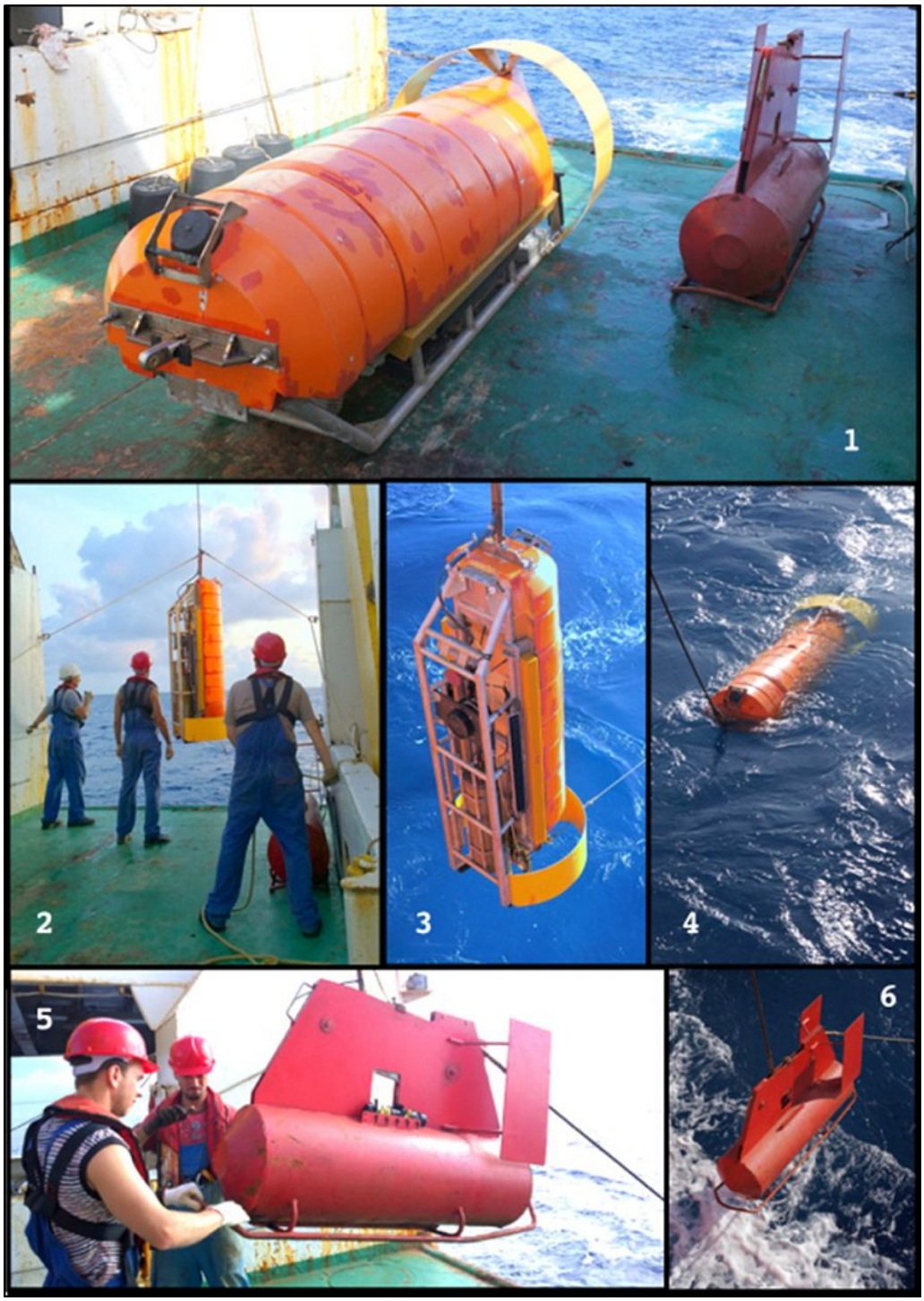


Figure 7.28 MAK Components and Deployment



7.3.14 Dredging Programmes

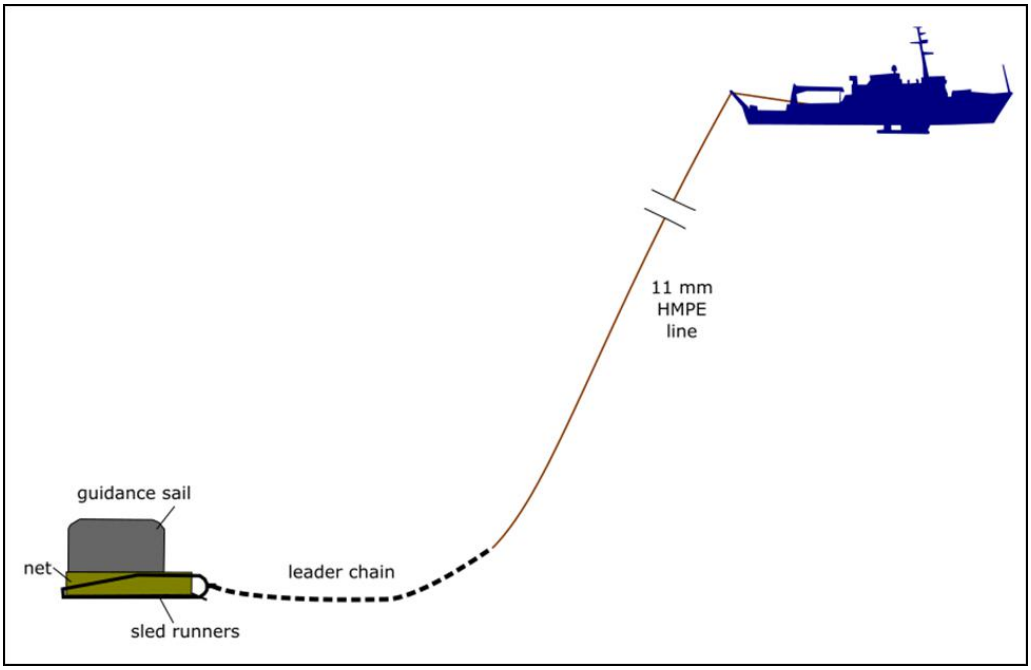
Dredging was carried out during both the CCZ13 and CCZ15 campaigns, albeit with different methodologies. The intent was to collect sample for metallurgical test work, including chemical whole rock analysis.

7.3.14.1 CCZ13 Epibenthic sled

An epibenthic sled was designed and built for the CCZ13 dredging (Figure 7.29, Figure 7.30). An epibenthic collector was chosen so as to:

- Be able to be set up to skim the seafloor collecting epibenthic and inbenthic located nodules with minimum mud;
- Be more able to clean itself of mud;
- Consequently, impact the environment less.

Figure 7.29 Epibenthic sled Deployment Schematic



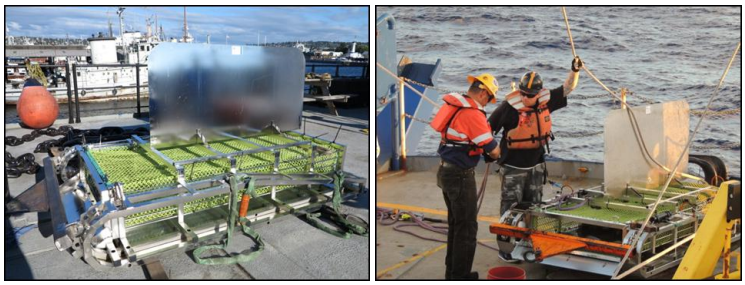
Sample handling procedures essentially comprised weighing on recovery, followed by screening (±and 3/8” or approximately 6 cm) and photography of all, or if an excess of material for the photo sheet, a typical sub-sample. Many of the nodules were broken from their time in the dredge.

After some trial and error, the approach generally taken to dredge was:

- About 1.5 km before the edge of the target zone, steam into the wind at 1.5–2.5 knots paying out line to 6–7 km.
- On reaching the bottom or the target line out slow to slowest effective forward speed (i.e., having available steerage). this was typically 0.3–0.8 kt speed over ground.
- Use line out to regulate load as transmitted to the load cell.
- Run the load between minimum (line slack) and maximum loads (lift off), decreasing the range around what was judged to be the effective towing load (this was typically a range of only about 40–80 kg).

- Once or twice during the deployment (later increased to 3–4 times) lift and lower the sled using the vessel speed to wash out excess mud that might be filling the sled (termed a “tea-bag” manoeuvre). Minimise use of the winch to avoid tipping the nose of the sled and losing sample.
- End the dredge by starting line in and speed up the boat to 2 knots.

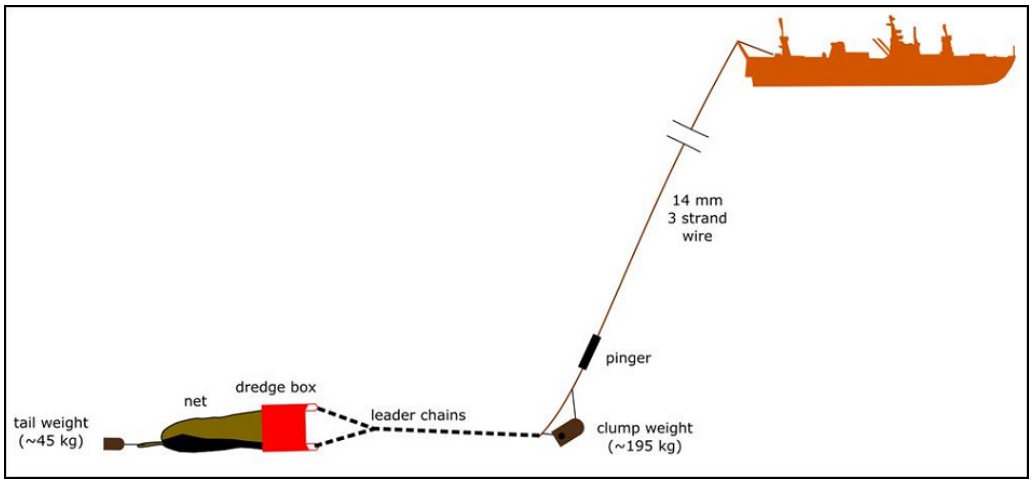
Figure 7.30 Photos of epibenthic sled



7.3.14.2 CCZ15 Galatea dredge

The dredging approach was changed in CCZ15 for reasons of practicality.

Figure 7.31 Galatea Dredge Deployment Schematic



The sample locations were picked to ensure that between the sampling of this campaign and the CCZ13 campaign, at least one dredge sample was taken in each contract area. Dredges were also the quickest and most effective way to sample Area A, albeit in a non-quantitative manner.

The process of dredging involved:

- Dredge lowered at 0.5 m/s for first 200 m then 1 m/s to the bottom, then slowed to 0.5 m/s till touching the seabed.
- Recovery to surface all the way at 1 m/s (full speed).

- The vessel maintained forward speed into the weather at all times (~0.8–1.3 knot SOG was OK no change in speed needed).
- Winch speed slowed but not stopped and the pinger trace height (~10 m) used to estimate when the dredge touches.
- “Teabag” manoeuvres used to clean the dredge between landings (each landing is about 1 minute and after lifting at about 0.7 m/s to 100 m the cleaning takes about 2–3 minutes before return to the seafloor at 0.5 m/s).
- 3–7 “teabags” were carried out depending on weight of sample required.

Figure 7.32 Operations and details of the YMG Galatea-trawl dredge



7.3.15 Marine Survey

During CCZ13 a TOML contract surveyor operated Caris HIPS (Hydrographic Data Processing System) software through the MBES system's dual head GPS array and maintained a digital survey log. Deployments and co-ordinates were written into a logbook. Communications were verbally to the bridge on the same level and via handheld radio to the back deck.

During CCZ15 RV Yuzhmorgeologiya's survey department coordinated operations and logged events (TOML personnel also kept a logbook). Various sensors (e.g., GPS, weather station, USBL) all fed to a central computer with most data read into Hydropro software. The main navigation screen from Hydropro was replicated on the bridge so that the officers there received real-time updates on current and planned movements. Communication between Hydrographer, Bridge, Pinger Operator, Winch Operator and Back Deck Supervisor was via a dedicated open intercom system. A USBL antenna was deployed through a small opening in the base of the ship and an IXSEA Posidonia 6000 gen1 system used this and an umbilical to transmit to the MAK deep tow system, and to communicate with a variety of 12 KHz beacons.

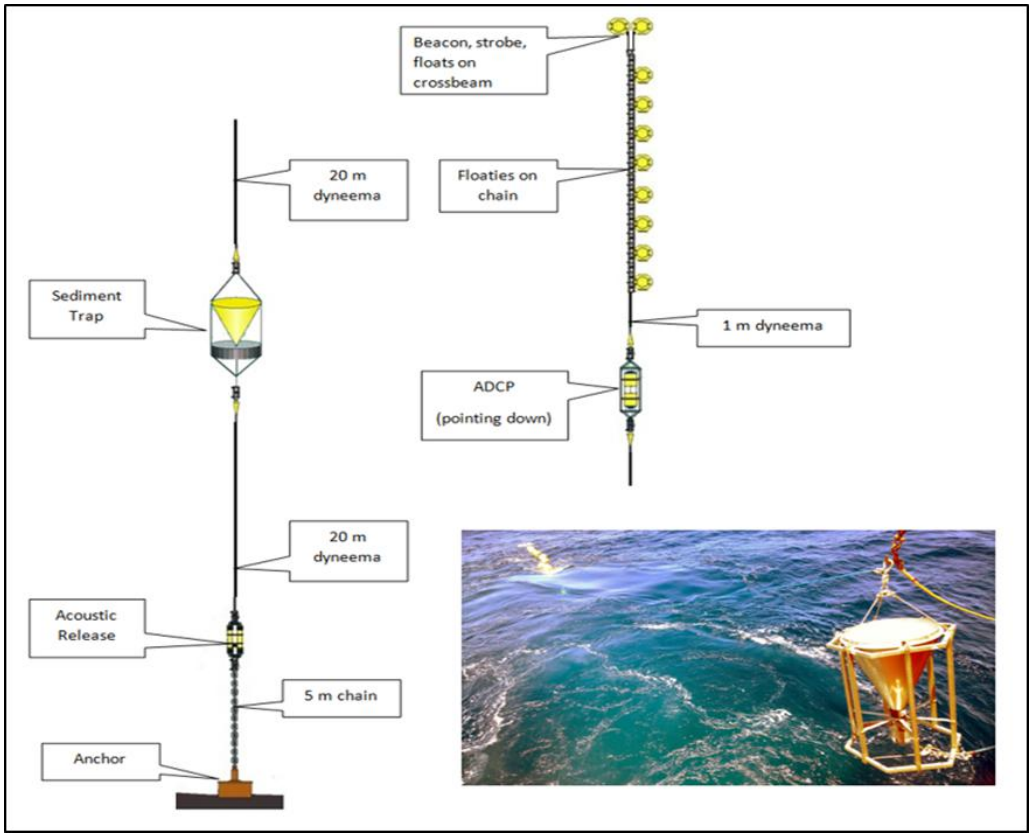
7.3.16 Other Programmes

7.3.16.1 Long Term Moorings

During and shortly after CCZ15, two moorings were deployed, one in Area C (S01) and one in Area B (S03).

The moorings were designed to be simple and inexpensive and to have a minimum two-year life (Figure 7.33). Engineering was by Sound Ocean Systems Inc based on environmental parameters provided by the Nautilus environmental team and an Erias Group (Melbourne, Australia) consultant.

Figure 7.33 CCZ15 Mooring Design and deployment of Mooring S01 in Area C



7.3.16.2 Other Environmental Data

A complete summary of environmental data collected during the CCZ15 campaign is presented in Table 7.8 below. Other specific data collected was:

- CSMF, or marine mammal observations, were recorded on a log by the bridge. During CCZ13 marine mammals were only seen outside the CCZ and during CCZ15 two mammal sightings were made with a solitary dolphin to the east of Area A and two whales (likely Sperm Whales) within Area D. Birds were seen on both campaigns but were only logged during CCZ15 (Figure 7.34)
- Weather Information, including logs, weather reports as well as interpretation of these data.

Figure 7.34 CCZ15 CSMF Events

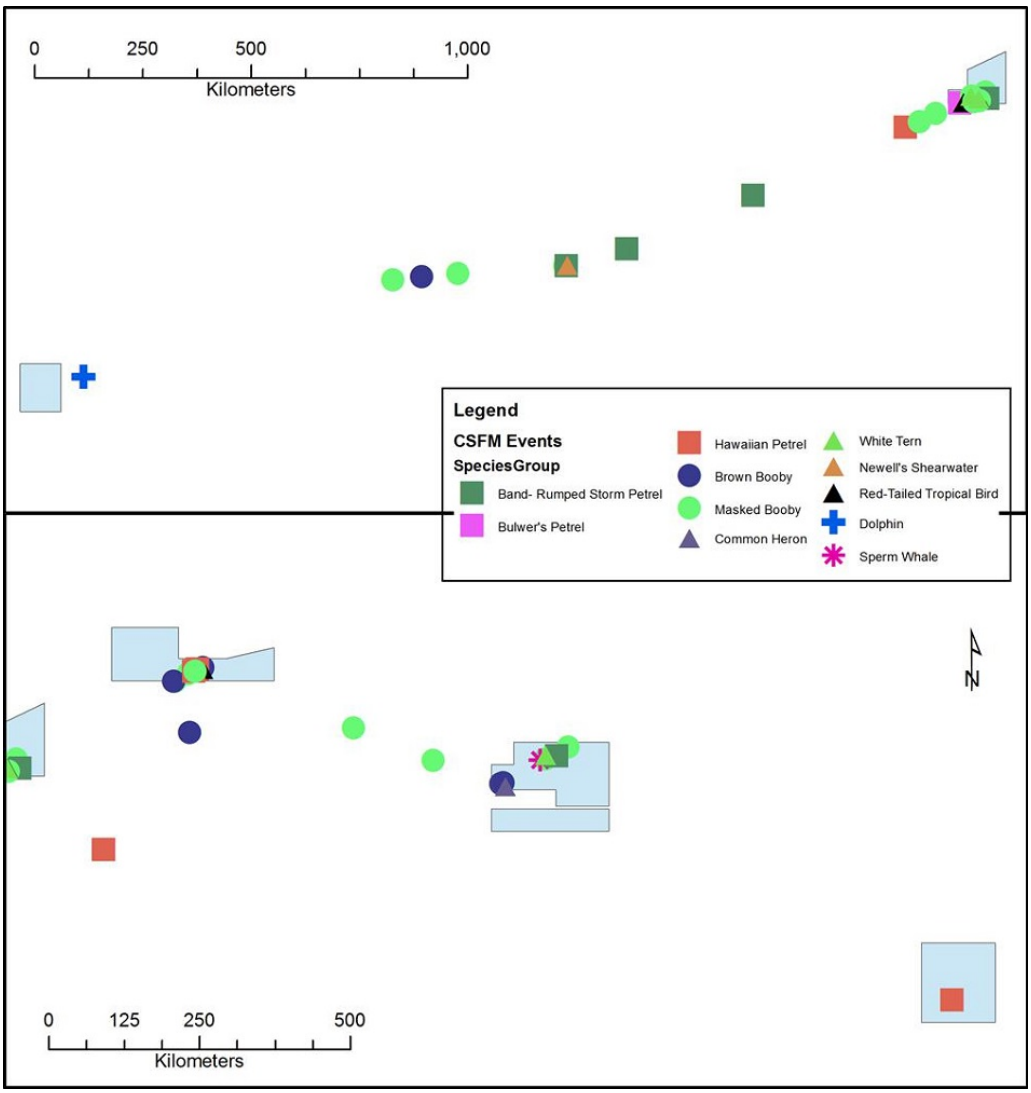


Table 7.8 CCZ15 Environmental Data Matrix

	Benthic Fauna Characterisation							Geological and Geomorphological Characterisation				Water Column Quality/Chemistry				Oceano-graphy	Ecosystem Function
	Mega	Macro	Meio	Micro	Overlying Fauna	Nodule Fauna	Benthic Fauna Morphology	SC	PSD	Geo-morphology	Substrate	TM	TSS	pH	Water Column Profiles (Temp °C & NTU)	Current Profiles	Sinking Particle Flux
Number of Samples	84	1195	997	458	78	383	see below	83	86	see below	see below	112	98	112	108	16	2
Logged Photographs	20857	20857	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Logged Video (hrs)	192	192	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Abundance	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA
Biological Diversity	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA
Community Composition	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA
Relation to Nodule Abundance/ Size	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA
Morphological Taxonomy	✓	✓	✓	NA	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA
Molecular Taxonomy	✓	✓	✓	✓	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA
Biotope Mapping	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA
Sampling Equipment	Photo Sled/ Boxcore	Photo Sled/ Boxcore/ Sub-cores	Boxcore/ Sub-cores	Boxcore/ Sub-cores	Boxcore	Boxcore	Photo Sled	Boxcore/ Sub-cores	Boxcore/ Sub-cores	Photo Sled / MBES / Side-Scan	Photo Sled / SBP/ MBES	Niskin Rosette	Niskin Rosette	Niskin Rosette	MAPR	ADCP / WCP	Near-Bottom Sediment Trap
Note:	Sub-cores sectioned at 3 to 4 horizons, dependent on fauna type. Horizons: 0-2 cm, 2-5 cm, 5-10 cm and 10-20 cm.																

Glossary							
SC	Sediment Chemistry	TM	Trace Metals	Photo Sled	576 line km	Side-scan + SBP	sub-bottom profiler - 286 line km
PSD	Particle Size Distribution	TSS	Total Suspended Solids	MAPR	Mini Autonomous Plume Recorder	WCP	Water Column Profiler
				ADCP	Acoustic Doppler Current Profiler	MBES	Multibeam Echosounder - 64,000 km2

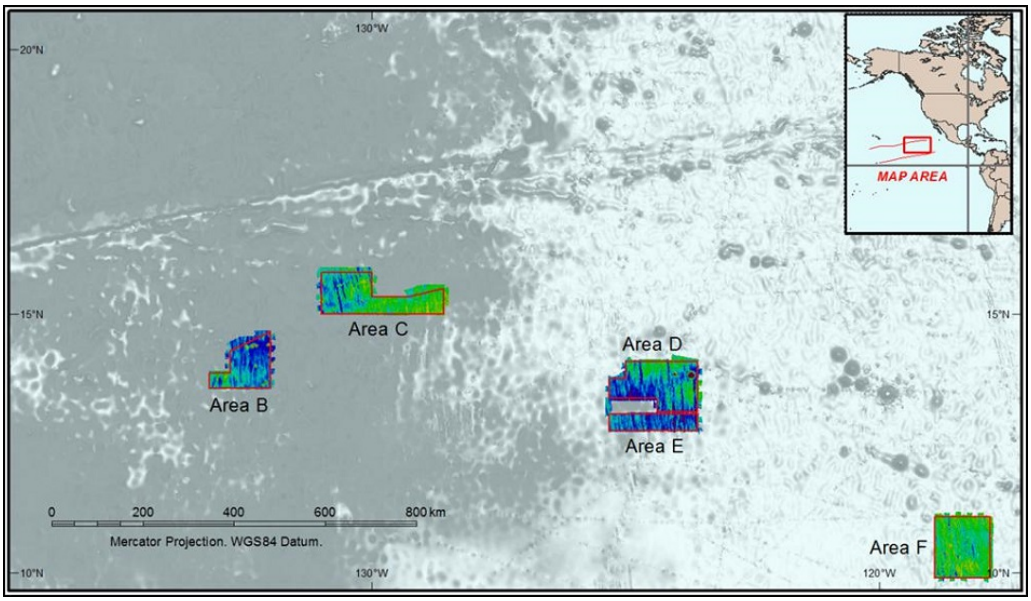
7.4 TOML Exploration Results

The exploration results discussed here include all data relevant to the mineral resource estimate. Much of the supporting data collected during the TOML CCZ13 and CCZ15 campaigns is still being processed. This includes much of the environmental and geotechnical data collected, but also includes mineralogy from samples and detailed geological interpretation from acoustic survey. This information will be reported, as relevant, at a later time.

7.4.1 TOML MBES results

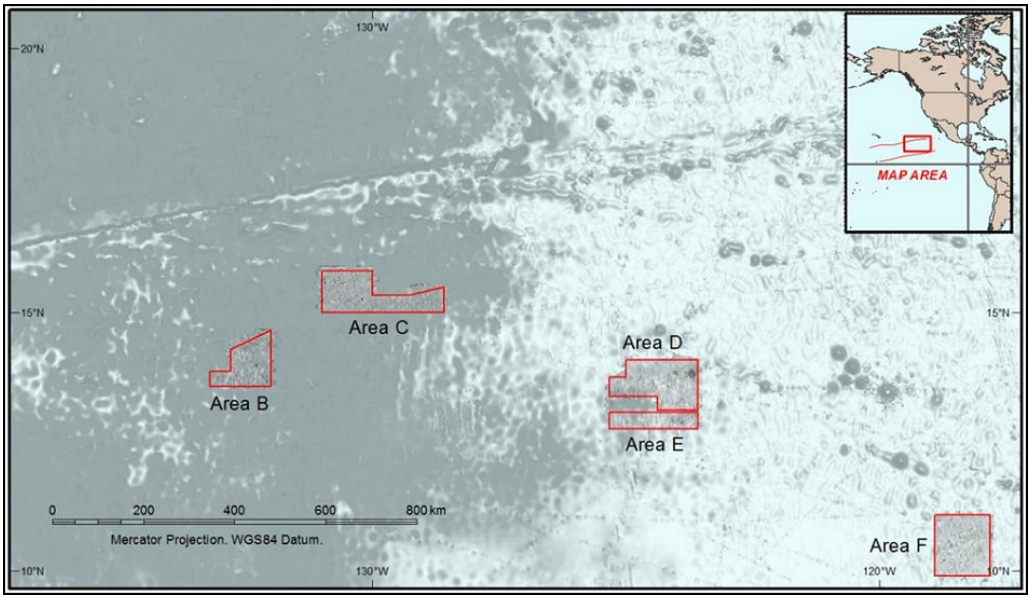
The MBES results are shown at a small scale in Figure 7.35 and Figure 7.36. The bathymetry shows that almost the entire area is composed abyssal hills and the bathymetry and backscatter together show that most of the area is covered by nodule bearing sediment.

Figure 7.35 CCZ13 MBES bathymetry coverage



Relief range blue to yellow is about 400 m scaled by each area. Background is the GEBCO bathymetric product (BODC, 2014)

Figure 7.36 CCZ13 MBES backscatter coverage



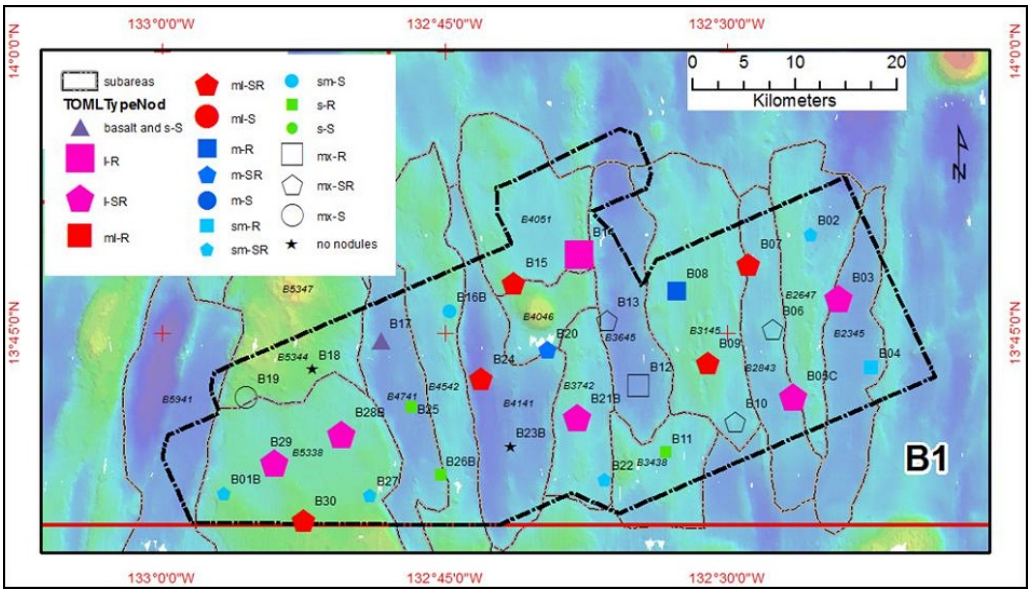
Background is the GEBCO bathymetric product (BODC, 2014)

The MBES bathymetry is used repeatedly in the following figures as the backdrop to the box-core results.

7.4.2 TOML Box-core results

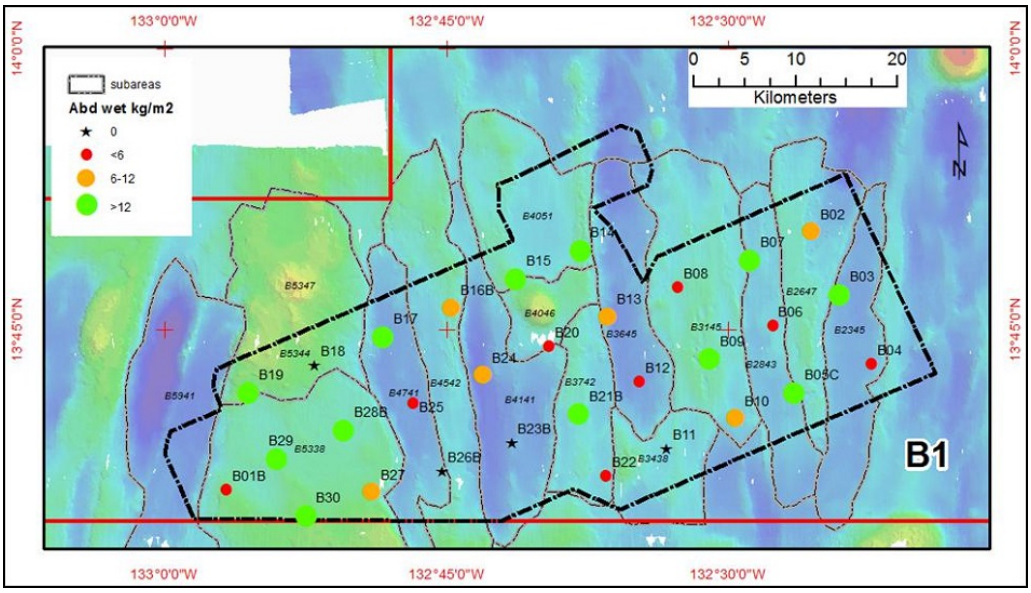
Figure 7.37 to Figure 7.51 summarises nodule and sediment characteristics of the box-core sites. Note that data exists at many of the same sites for water column characteristics and chemistry and fauna numbers and taxonomy data.

Figure 7.37 Nodule Types, Area B1



Nodule abundances are reported in wet kg/m^2, estimated using the process and principles discussed in section 7.5.6.

Figure 7.38 Nodule Abundance, Area B1



Shear strength is classified per the process and classification detailed in Section 9.3.7.

Figure 7.39 Shear Strength Class, Area B1

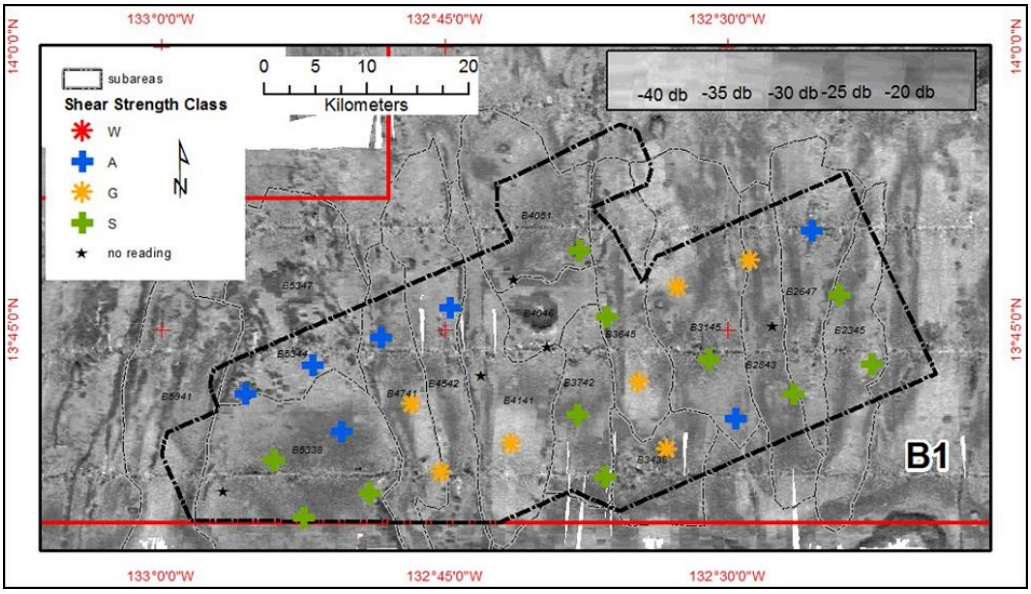


Figure 7.40 Nodule Types, Area C1

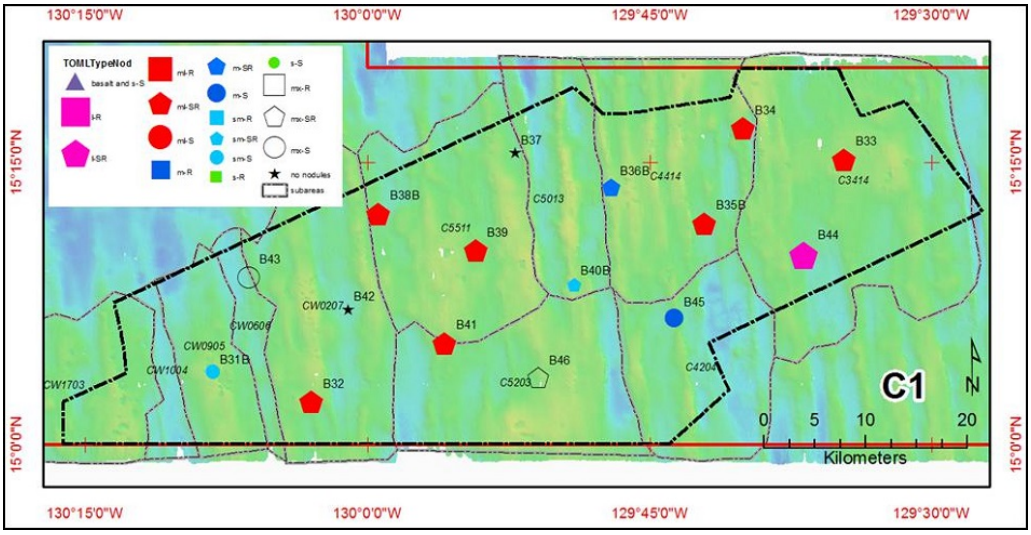


Figure 7.41 Nodule Abundance Area, C1

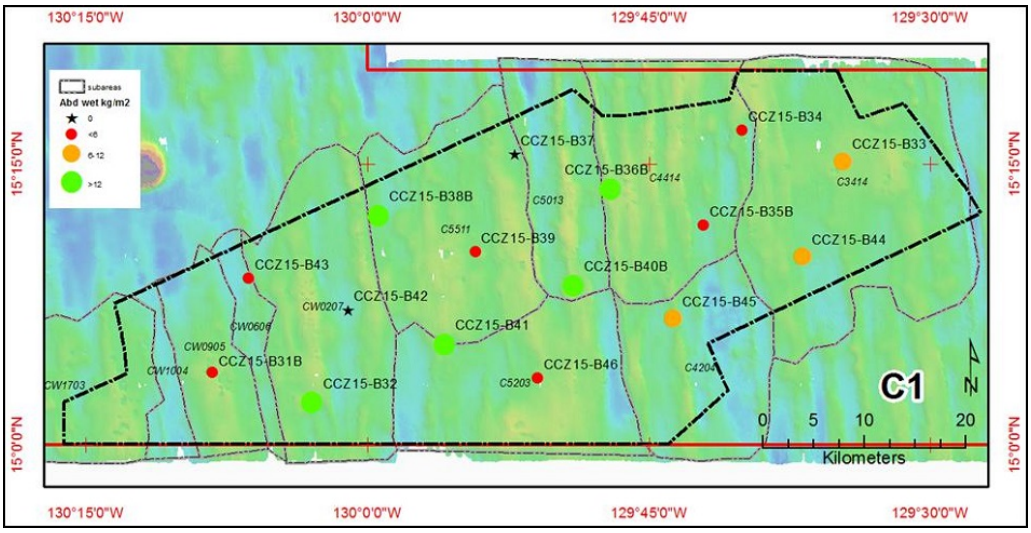


Figure 7.42 Shear Strength Class, Area C1

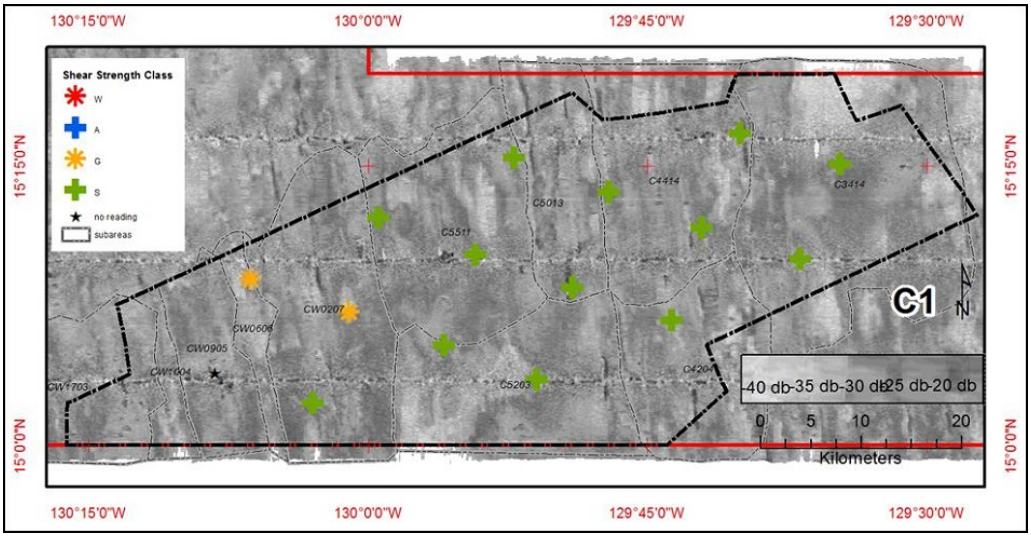


Figure 7.43 Nodule Types, Area D2

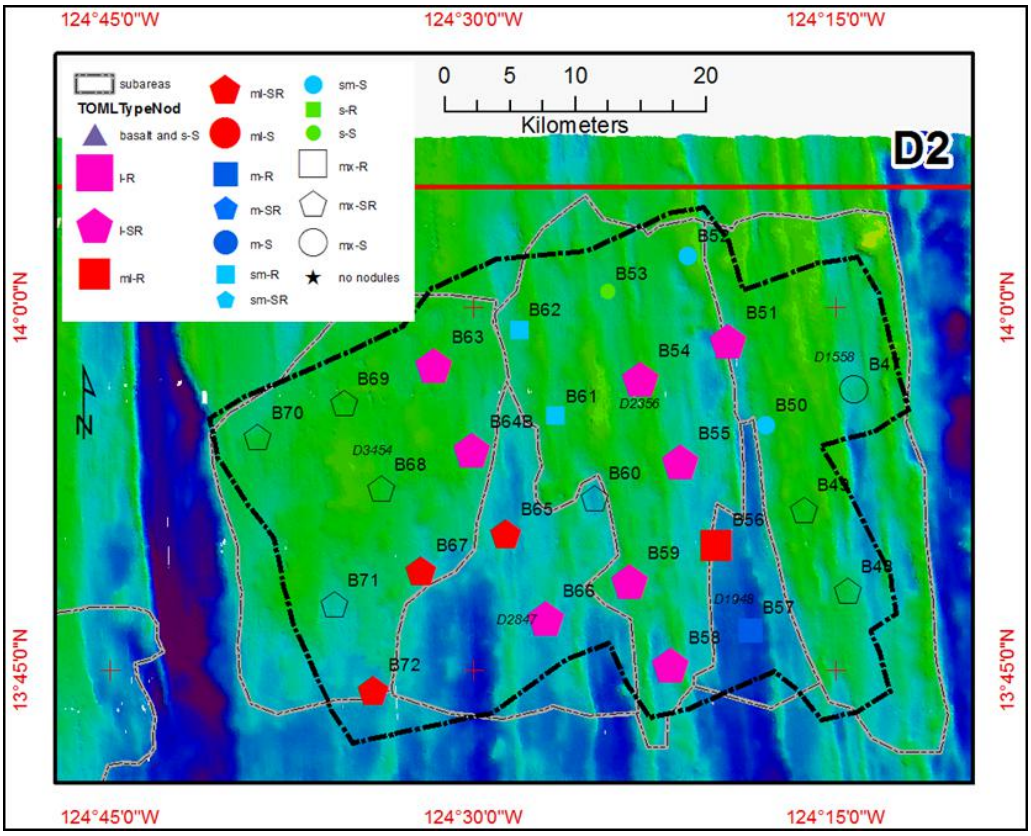


Figure 7.44 Nodule Abundance Area, D2

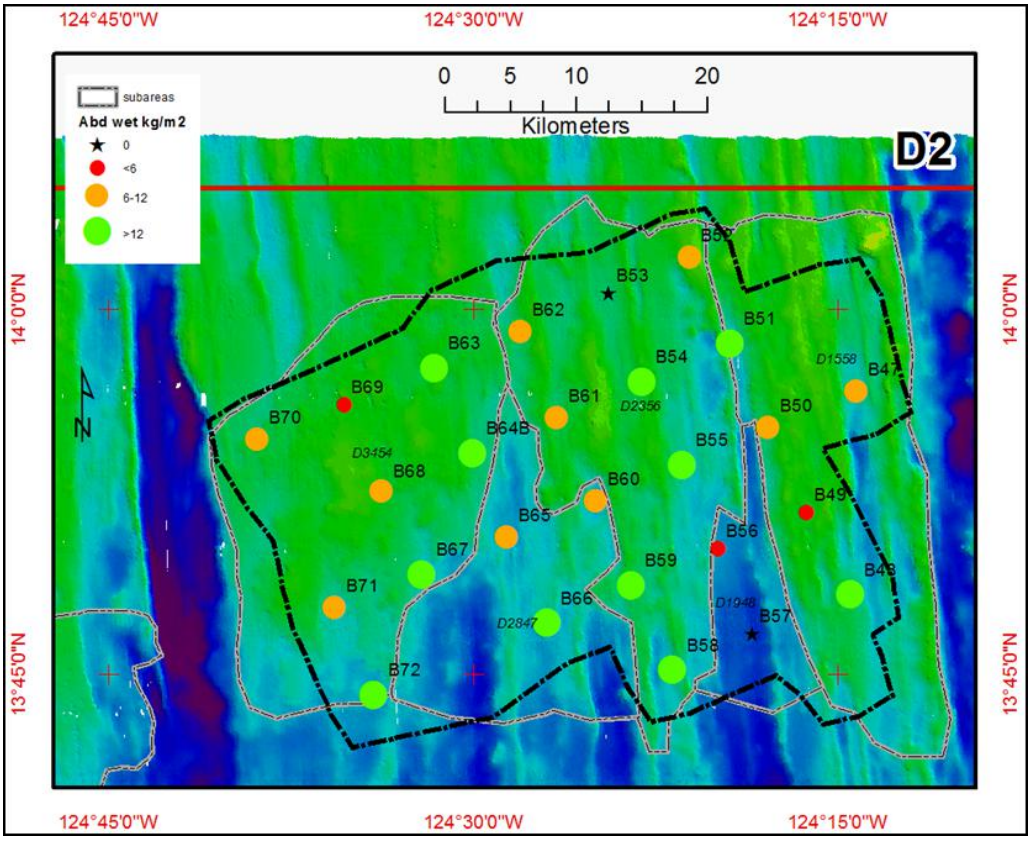


Figure 7.45 Vane Shear Strength Class, Area D2

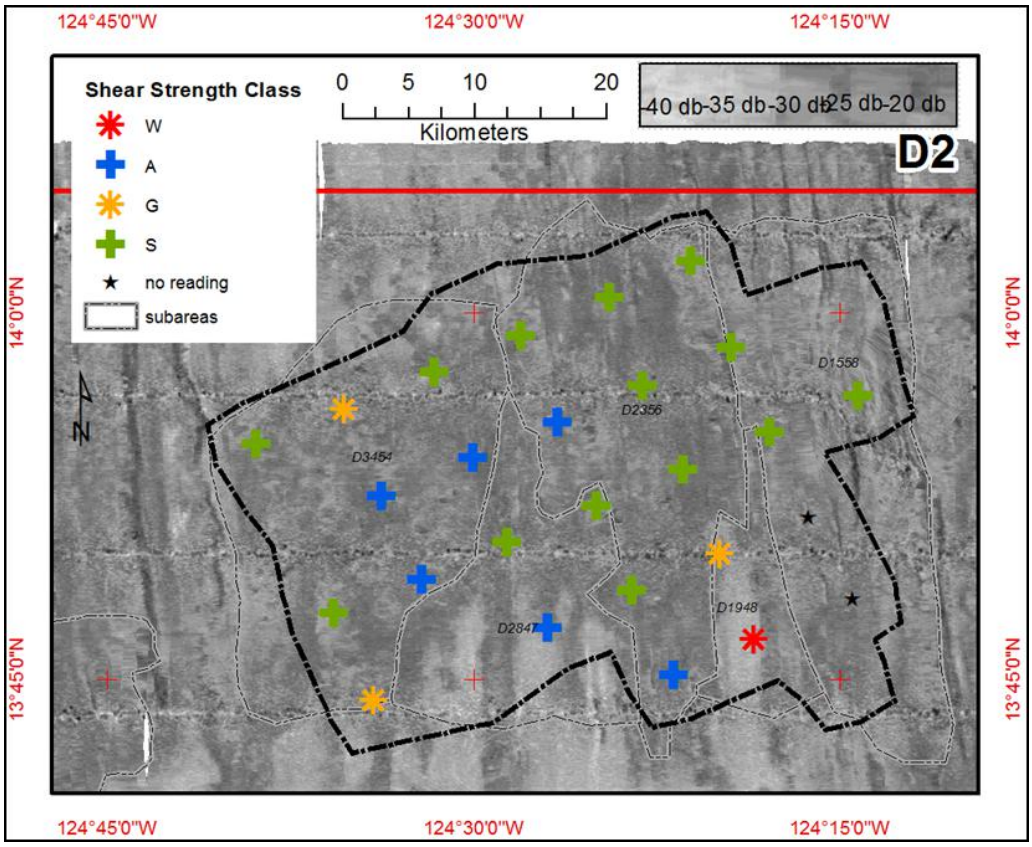


Figure 7.46 Nodule Types, Area D1

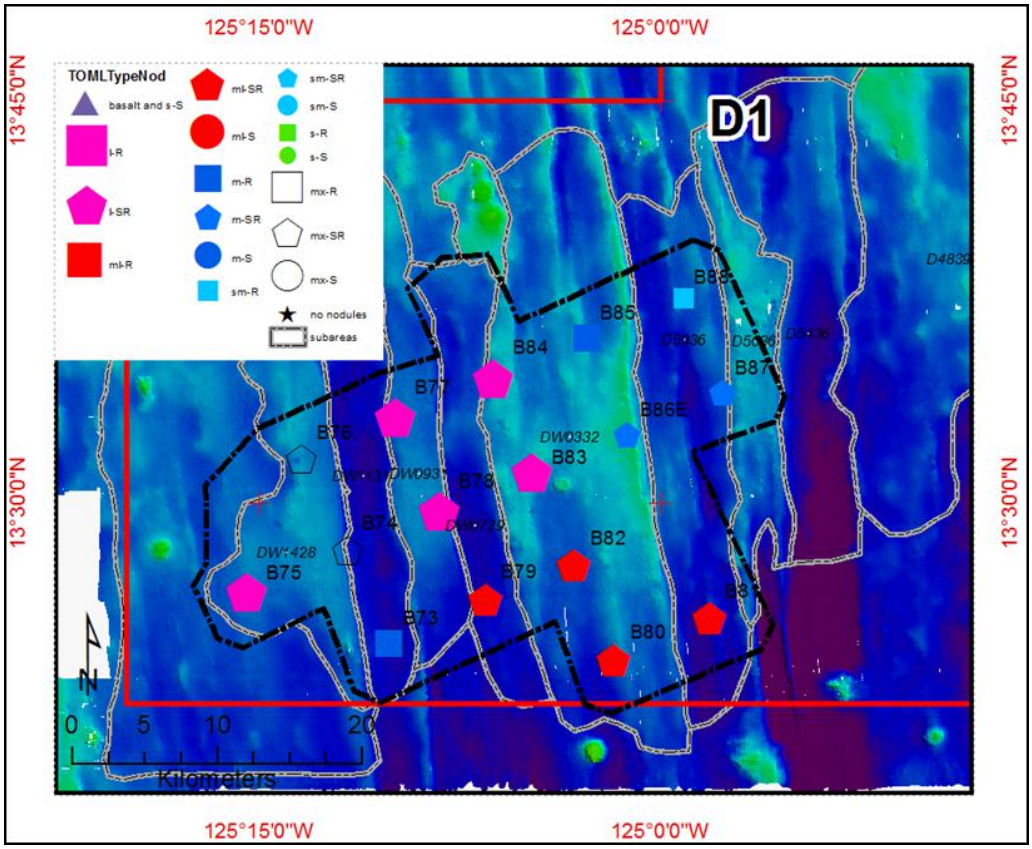


Figure 7.47 Nodule Abundance, Area D1

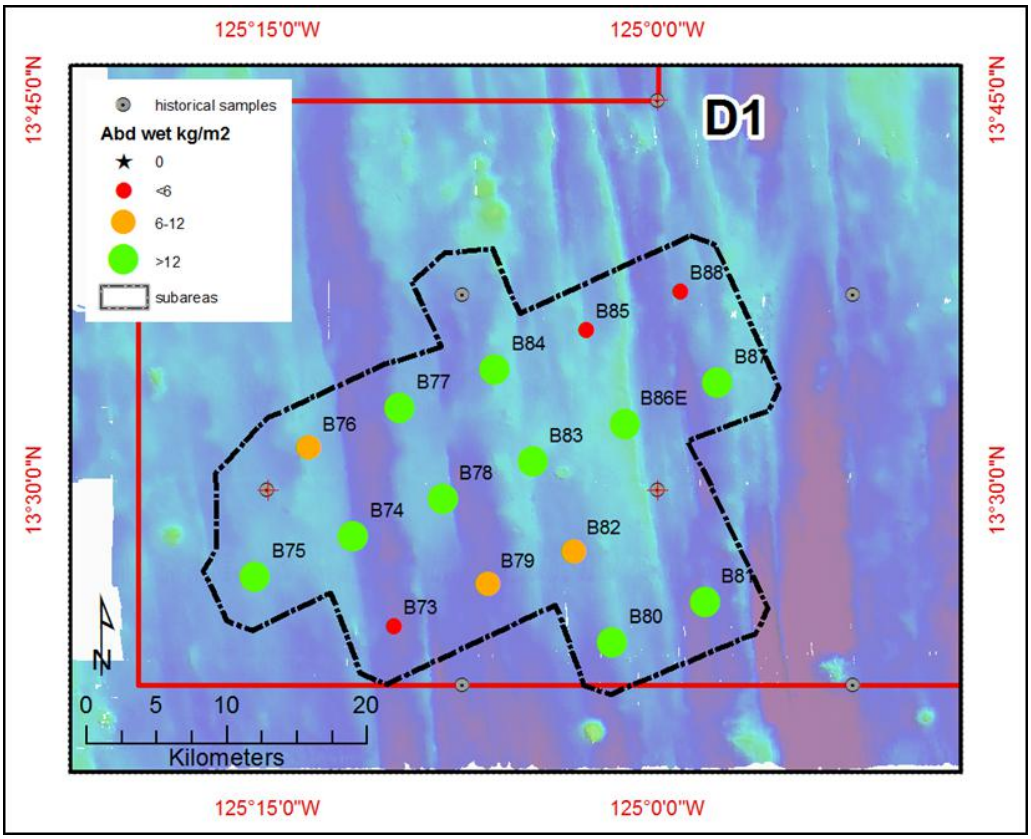


Figure 7.48 Vane Shear Strength Class, Area D1

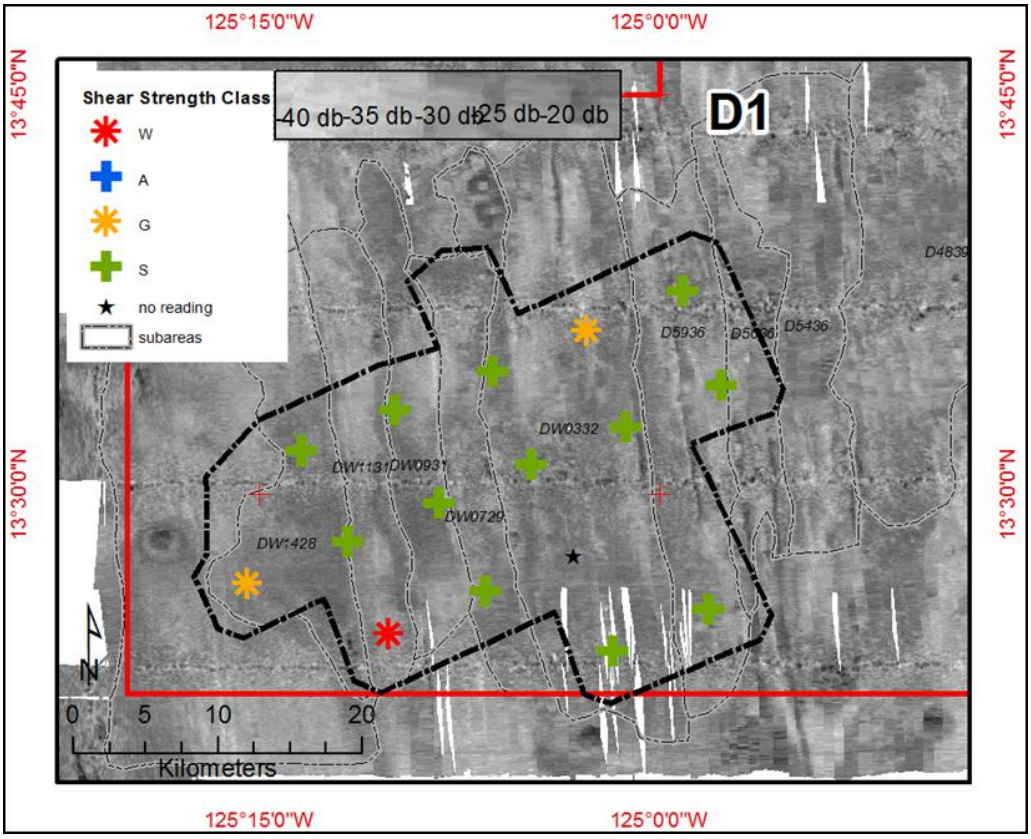


Figure 7.49 Nodule Types, Areas F and F1

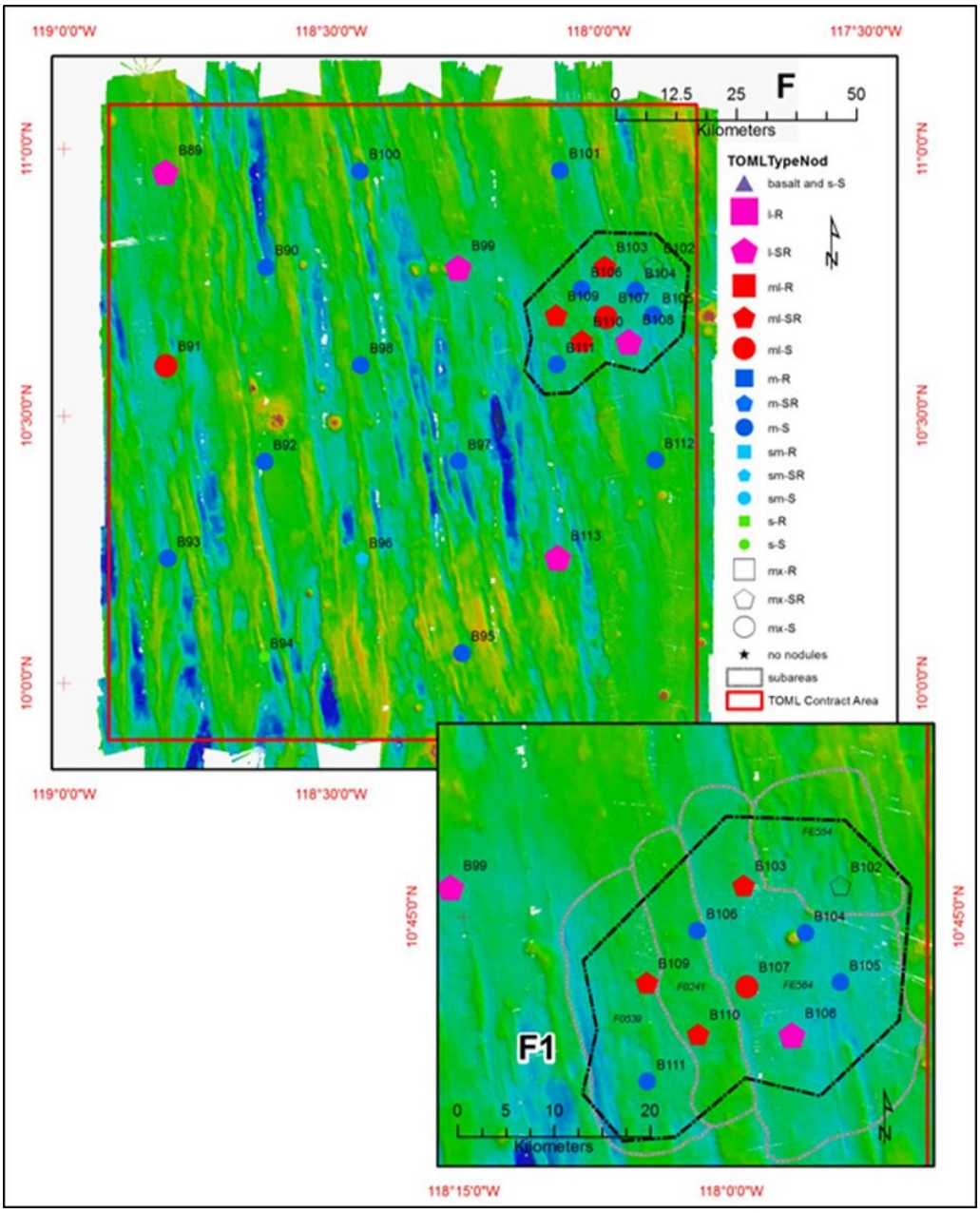


Figure 7.50 Nodule Abundance, Areas F and F1

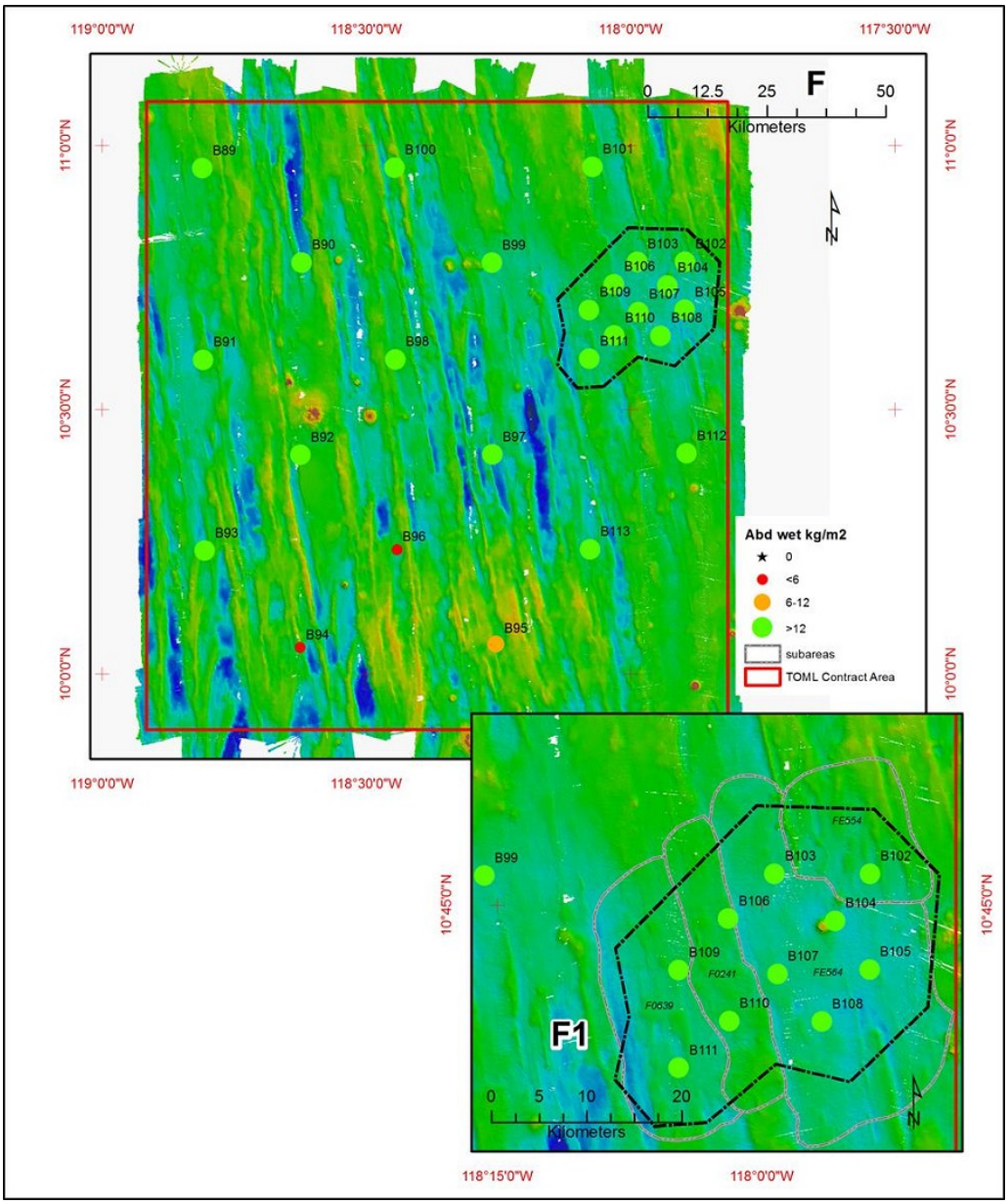
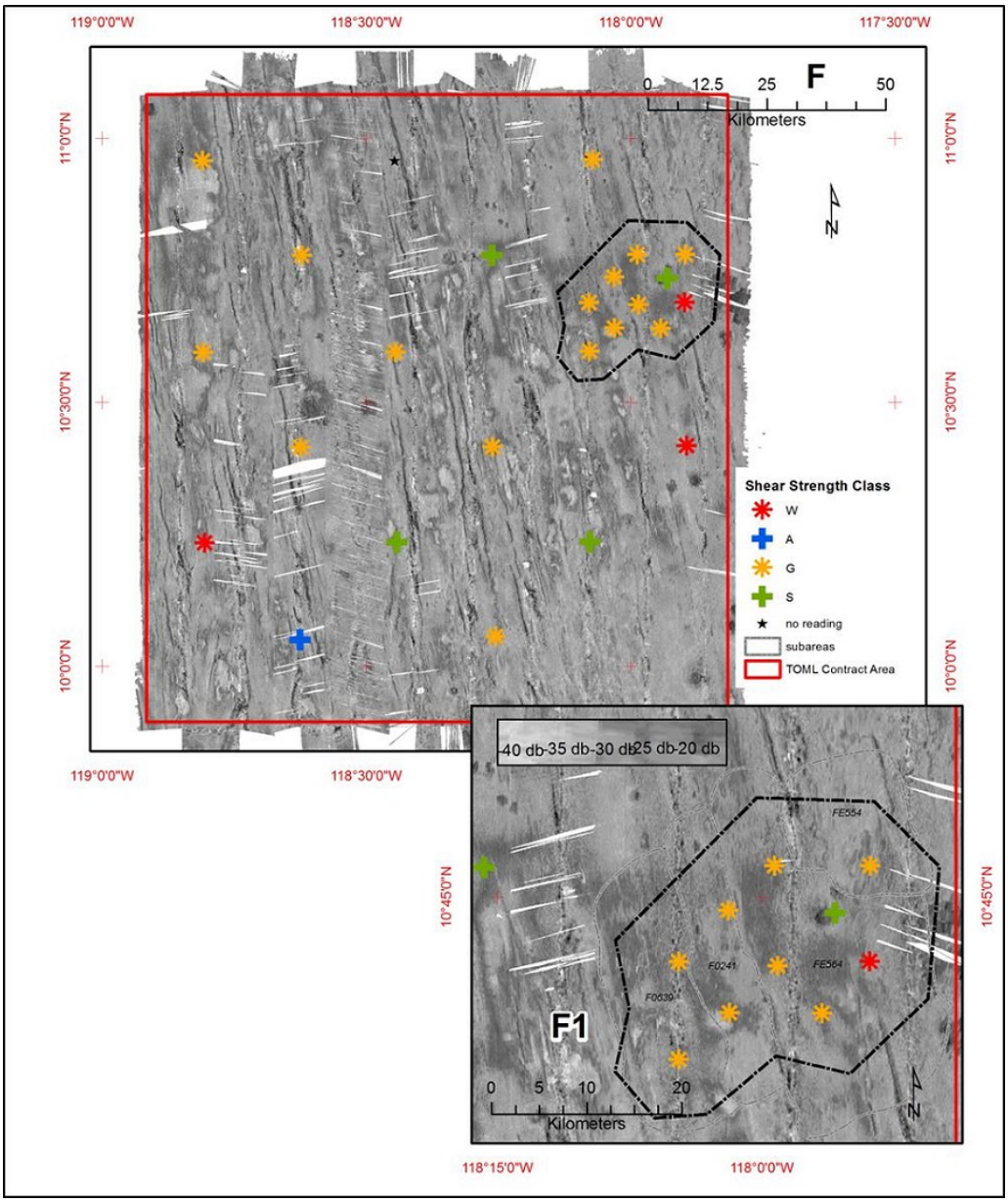


Figure 7.51 Vane Shear Strength Class, Areas F and F1



7.4.3 TOML Photo-profile results

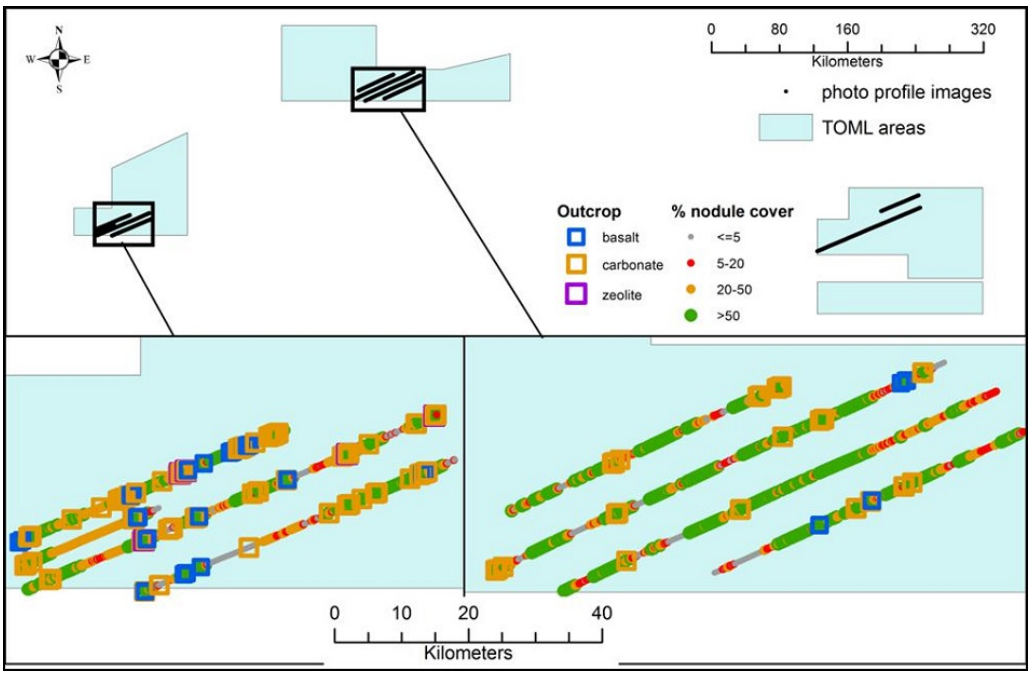
Photo-profiling provided key data on nodule type and abundance as well as for baseline logging of mega-fauna. Ten lines were completed, with one in two parts after equipment repair (Figure 7.52).

Use of photographs in nodule abundance estimations is not new and is discussed by Felix (1980) and by UNOETO (1979). These results are included with the box-core based abundance data used for mineral resource estimation.

An estimation of nodule cover (% visible cover by nodules on the seafloor) was also possible. This is much simpler to measure than nodule long axis as it is a simple colour contrast. Percentage cover does relate to abundance, but the relationship is much weaker than nodule long axis, so nodule cover was not used in the mineral resource estimate except to support interpreted and measured continuity.

When combined with observations of outcrop, the nodule coverage plots in Figure 7.52 give a good indication of the high levels of continuity for the nodules amongst the fault bounded abyssal hills. The process clearly does not work in Area D where sediment cover is high.

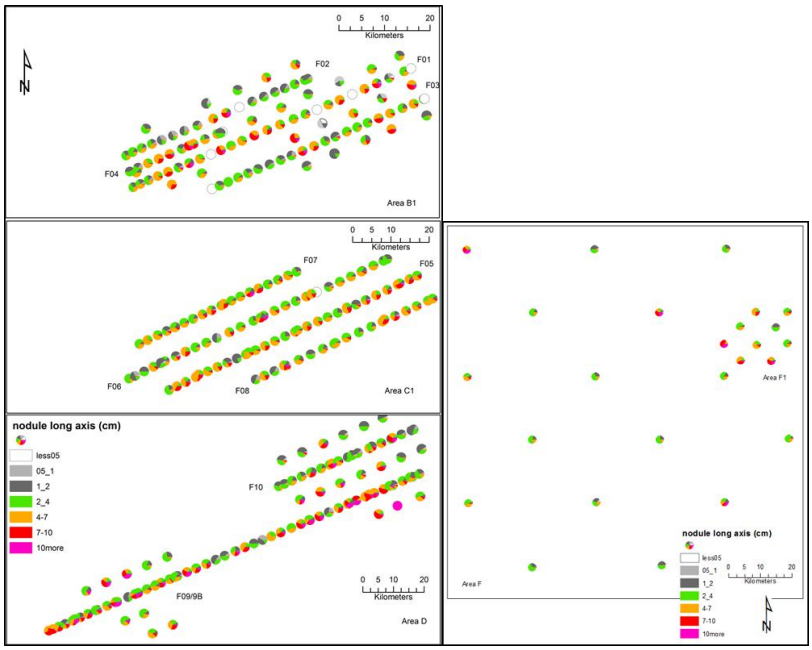
Figure 7.52 Neptune Photo-profile logging of % cover and outcrop types



Insets only shown for Area B (L) and C (R)

Nodule size analysis (combined with box core observations) is shown in Figure 7.53. An understanding of nodule sizes and other characteristics such as rugosity and strength will be useful in designing the mining system. Considerable information was collected in respect of long axis measurements taken from photo-profile images (roughly every 100th image for abundance estimation purposes).

Figure 7.53 Nodule sizes and types from photo-profiles and box-cores

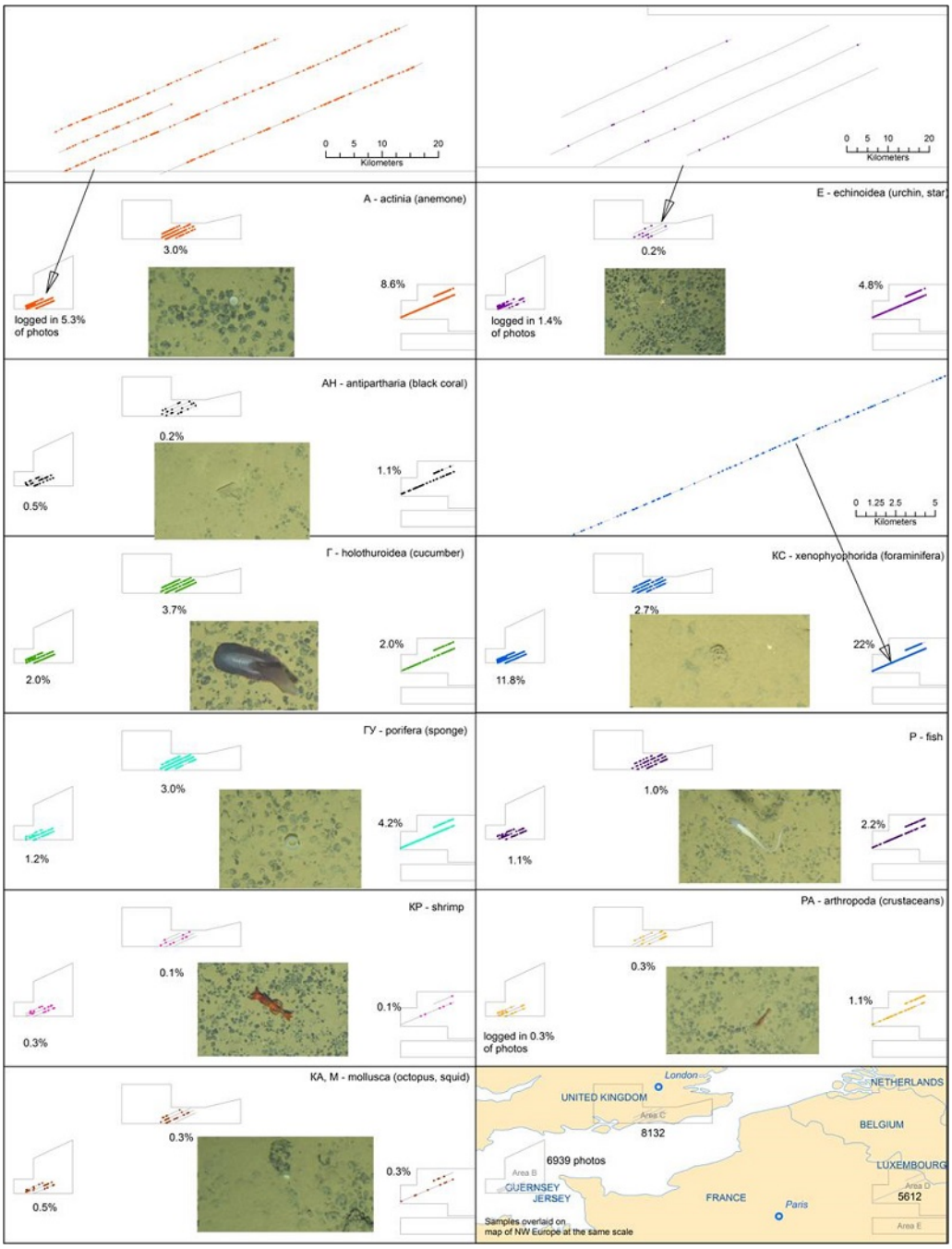


Top: B1, Middle-left: C1, Bottom-left: D1-D2, Bottom right: F and F1

All the surveyed areas host nodules of different sizes but Area B has mixed sized nodules and includes many of the smaller nodules. In Area C, nodule size increases to an average of small to medium and they are well distributed throughout. Within Area D, there is a mixture of sizes with some very large nodules found in the box-core samples. Bigger nodules were recovered from the box-corer than measured on the photo-profiling lines due to a frequent underestimation related to the sediment cover in this area. Area F has typically medium sized nodules but very large size nodules are seen in places.

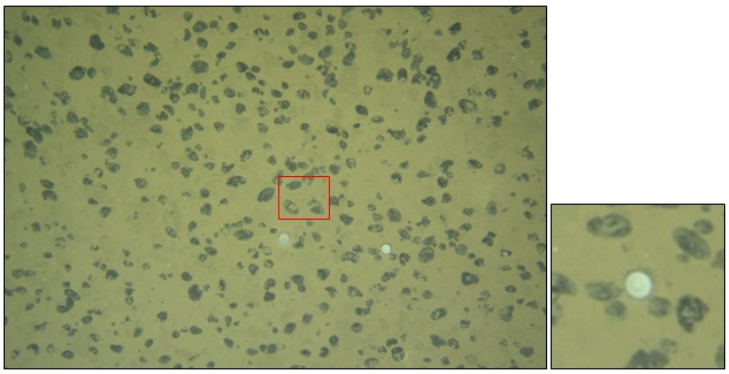
Photos were also logged as they were collected for visible megafauna with preliminary logging results in Figure 7.54.

Figure 7.54 Neptune Photo-profile preliminary logging summary distribution of megafauna



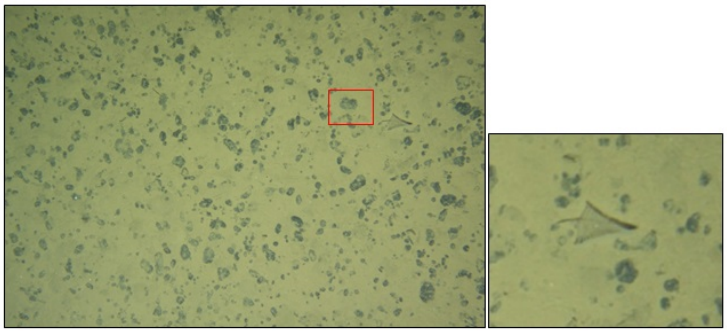
Some examples of the main types of megafauna seen in the photo-profiling conducted by TOML during the CCZ15 campaign are shown below. The photos were selected effectively at random from logging codes of the ~20,000 photos captured during that campaign.

Figure 7.55 Two genus Actinia (sea anemone) in Area C1



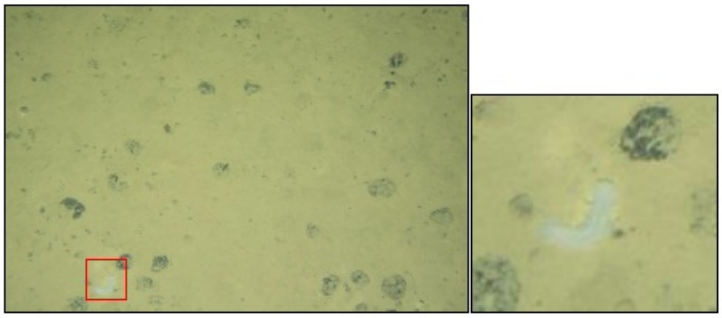
Main photo: 2.4 x 1.5 m; CCZ15-F08: 2015_09_08_154911

Figure 7.56 Order Antipatharia (black coral) in Area B1



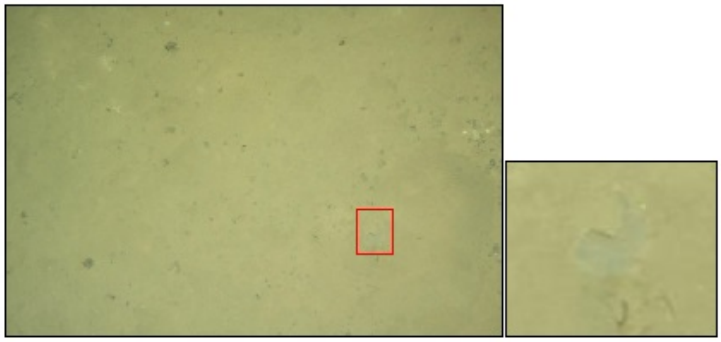
Main photo: 2.4 x 1.5 m; CCZ15-F03: 2015_08_21_205254

Figure 7.57 Class Holothuroidea (sea cucumber) in Area D



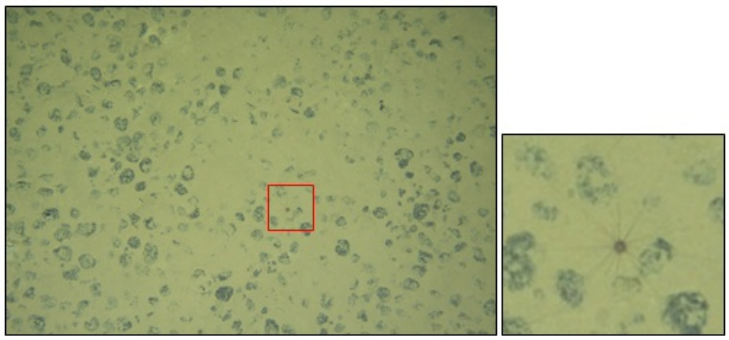
Main photo: 2.4 x 1.5 m; CCZ15-F09B: 2015_09_14_185421

Figure 7.58 Phylum Porifera (sponge) in Area B1



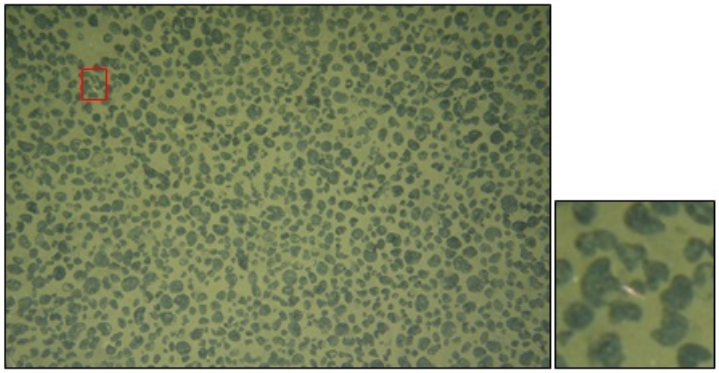
Main photo: 2.4 x 1.5 m; CCZ15-F04: 2015_08_26_082625

Figure 7.59 Class Echinoidea (sea urchin) in Area D2



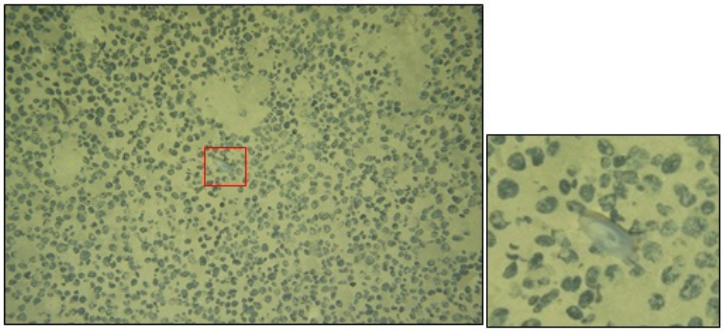
Main photo: 2.4 x 1.5 m; F10: 2015_09_16_070625

Figure 7.60 Order Decapoda (shrimp) in Area C1



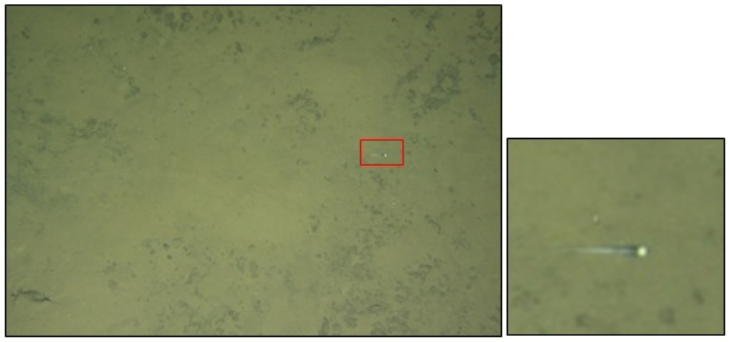
Main photo: 2.4 x 1.5 m; CCZ15-F05: 2015_08_29_060636

Figure 7.61 Order Teuthida (squid) in Area B1



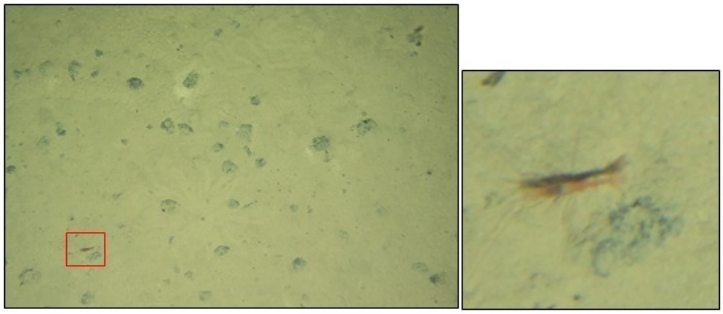
Main photo: 2.4 x 1.5 m; CCZ15-F01: 2015_08_11_110540

Figure 7.62 Fish in Area C



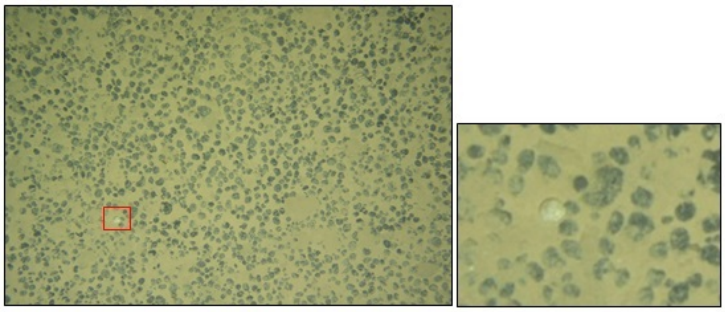
Main photo: 2.4 x 1.5 m; CCZ15-F06: 2015_09_02_190522

Figure 7.63 Phylum Arthropoda (excludes decapods) in Area D1



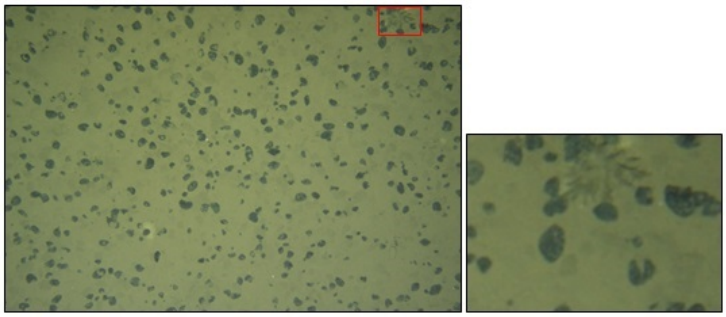
Main photo: 2.4 x 1.5 m; CCZ15-F09B: 2015_09_14_195043

Figure 7.64 Phylum mollusca (bivalve example) in Area B1



Main photo: 2.4 x 1.5 m; CCZ15-F02: 2015_08_16_195404

Figure 7.65 Class xenophyophorida (protozoan)



Main photo: 2.4 x 1.5 m; CCZ15-F07: 2015_09_03_190541

7.4.4 TOML Photo-profile based habitat mapping trial

A habitat classification scheme was developed during the CCZ15 campaign that was based on previous work in the CCZ and that adopted elements of existing classifications schemes, namely the US Coastal and Marine Ecological Classification Standard (CMECS, FGDC, 2012), the European Nature Information System (EUNIS, Davies et al. 2004) and the Collaborative and Automated Tools for Analysis of Marine Imagery (CATAMI, Althaus et al. 2015). The TOML scheme contained three components (Geomorphology, Substrate and Biological). The scheme was trialled on TOML area B1 (Figure 7.66, Figure 7.67) with the intent to apply to other areas after review.

Figure 7.66 Areas where biota was not observed

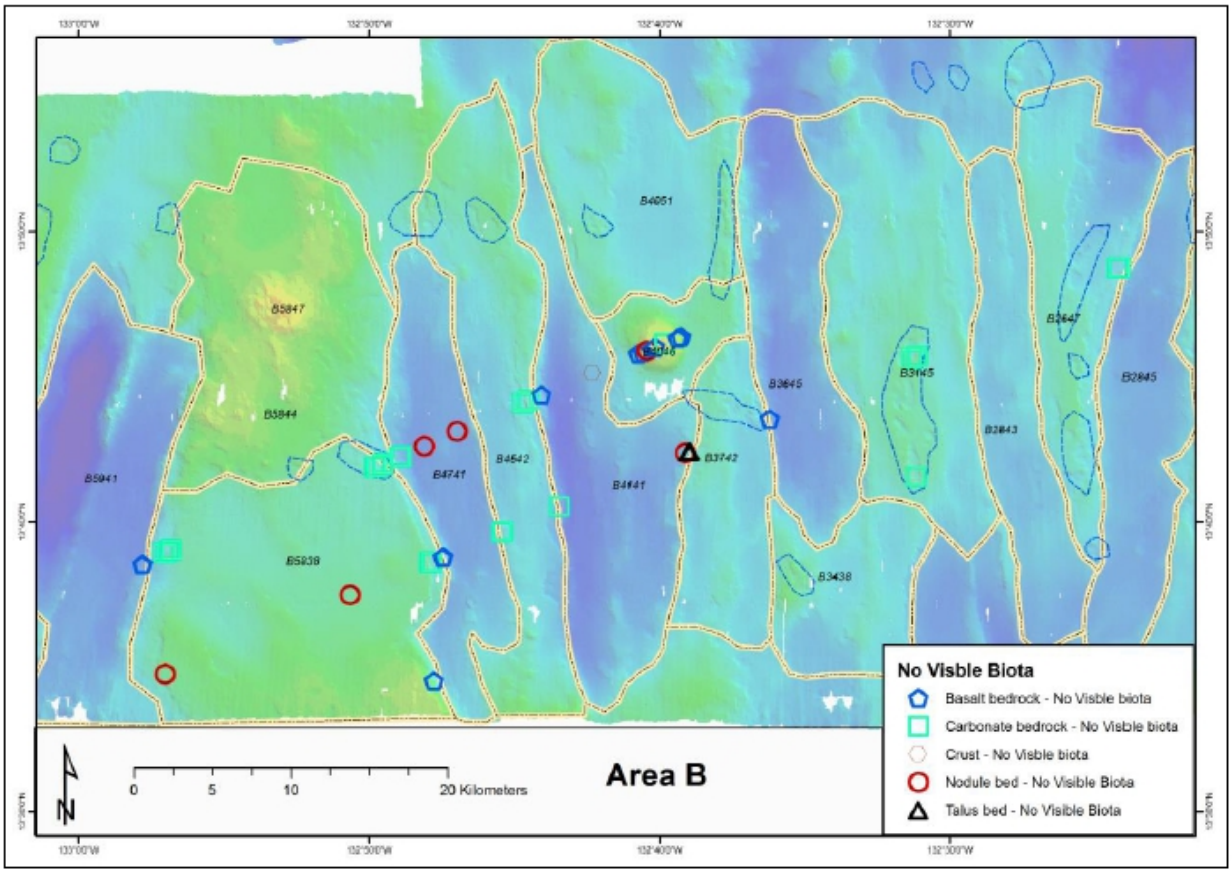
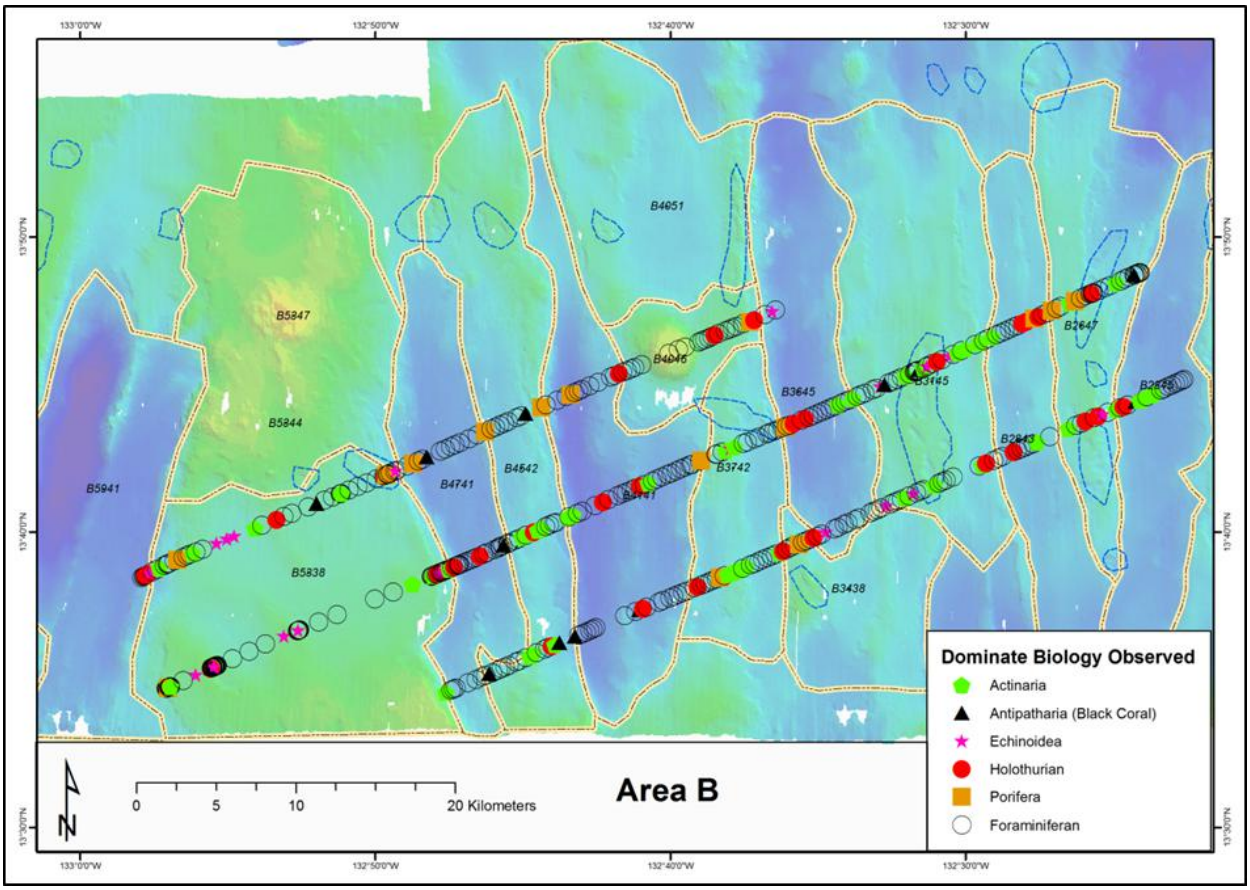


Figure 7.67 Dominant biota observed



The trial involved detailed classification of every tenth photo taken along three Neptune photo sled lines (CCZ15-F01, F02 and F03). In some areas, the number of photos logged was increased to capture seafloor features that were smaller in area.

Data were analysed to determine if there were any significant relationships between the distribution of benthic biota and the geoforms and substrate types on which they occurred. The analysis made use of boosted regression trees (BRT) via the R statistical software package
(R Core Team, 2016) and multivariate cluster analysis via Primer-e software (Clarke and Gorley, 2006). The trial dataset used in the analysis was relatively small and analysis was restricted to fauna that were most abundant in photo logging. Therefore, some caution is needed when interpreting the results. BRT analysis was not extended to investigate variable interactions or predictions of habitat suitability.

7.4.4.1 BRT Results

Actinarians (sea anemones) were predominantly observed in nodule bearing sediment. The BRT results indicated that actinarians were most frequently associated with nodule cover class of 21–40%, 41–60% and >60%. They were most commonly associated with large Type C nodules.

Megafauna-sized foraminifera were observed in the majority of photographs logged. Volcanic and carbonate bedrock were the only substrates that did not support foraminifera.

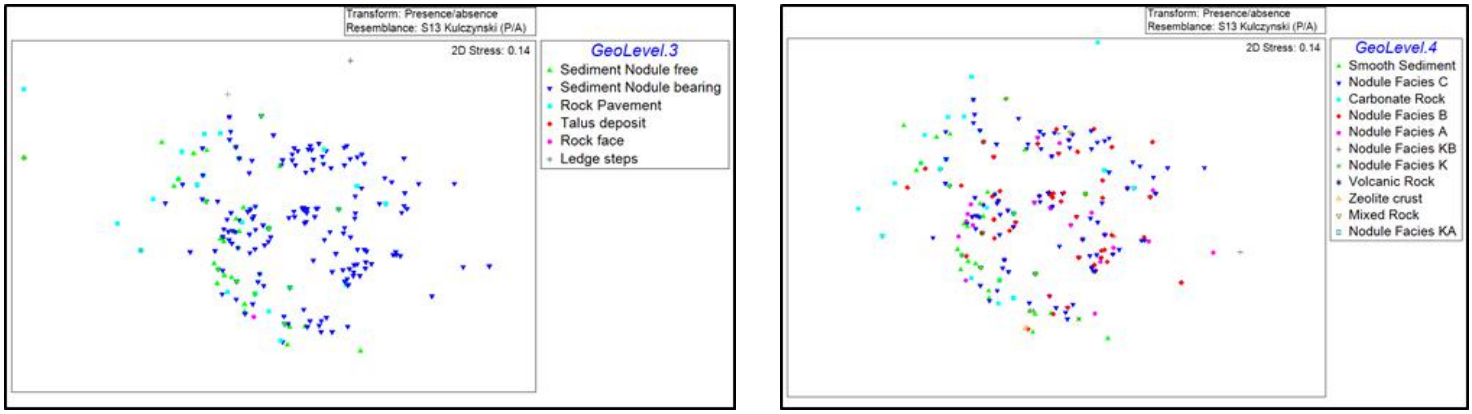
BRT analysis using a logging class “no visible biota” indicated that the seamount in Area B and step/ledge geoforms were devoid of megafauna. The substrate observed in these areas was volcanic and carbonate bedrock and crust.

7.4.4.2 Cluster Analysis Results

Morphospecies abundance was compiled for each photo frame, along with the four-level Geomorphology and Substrate components logged from each frame. Data from two photo sled lines in Area B were used in this preliminary analysis. The abundance data were transformed to presence-absence. This is the most aggressive form of transformation and so patterns detected using presence-absence data are considered to represent the strongest ecological patterns of interest to the preliminary analysis.

There was no clustering of samples according to Geoform levels 1 and 2. Samples did cluster according to Geoform Level 3 (Figure 7.68), with nodule-bearing sediment forming a somewhat dispersed cluster that overlaps with, but is distinct from, nodule-free sediments. A stress of 0.14 in the multidimensional scaling plot indicates that patterns are fairly well represented in two dimensions. A 3D plot of the same data decreased the stress to 0.1, indicating that there is an important third dimension to the data. Analysis of Similarity (ANOSIM routine) indicated that the difference between nodule-free and nodule-bearing sediments was statistically significant (Global R = 0.326, R significance < 0.05 for pairwise comparison). Rock pavement appeared to form a third intermediate and dispersed group and ANOSIM indicated that the rock pavement samples were significantly distinct from nodule-free sediments and nodule-bearing sediments.

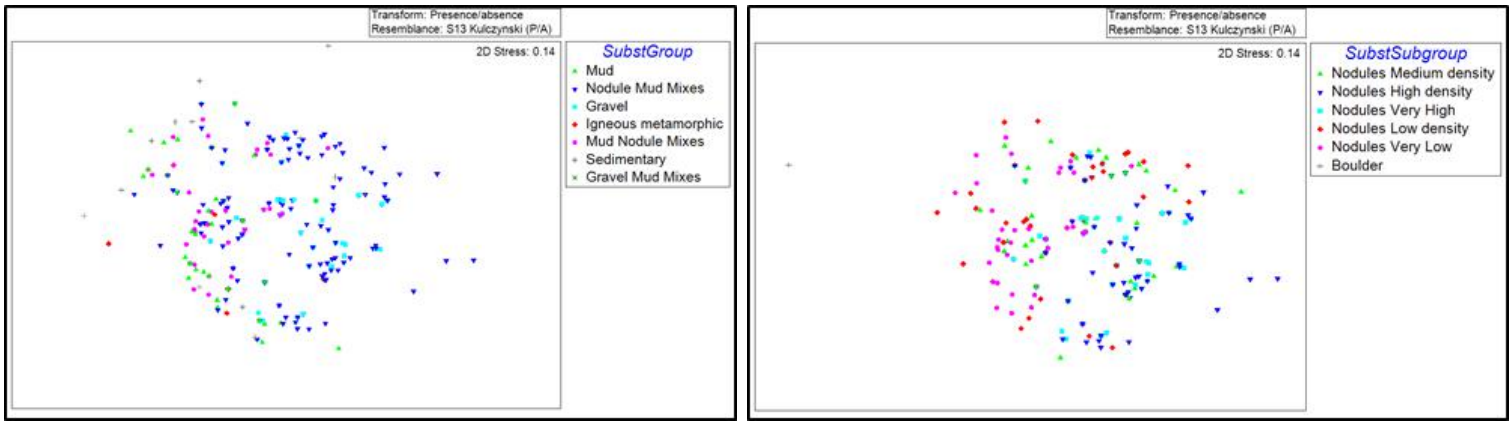
Figure 7.68 Samples (image frames) coded by Geoform Level 3 (L) and 4 (R)



At Geoform Level 4, samples from smooth sediment formed a dispersed but separate cluster from those on nodule-associated geoforms (Figure 7.68) but there was no significant clustering according to nodule facies type, a result confirmed by ANOSIM.

At the Substrate Group level (level 3 of the substrate classification hierarchy) there was dispersion among samples, but samples from nodule-mud mixes and gravels formed a group that was differentiated from mud and mud-nodule mixes (Figure 7.69). These groups represented varying dominance of nodules and ANOSIM indicated that the pairwise difference between nodule-mud mixes and mud-nodule mixes was significant. At level 4 of the substrate classification, nodule density was estimated. Again there was dispersion among samples, but those from high density (41–60%) and very high density (60+%) nodule density substrates clustered separately from the low (6-20%) and very low (1–5%) nodule density substrates (Figure 7.69). ANOSIM indicated that these groups were significantly different. Differences in community composition among substrate types may be expected because nodules represent attachment surfaces for sessile invertebrates that favour hard substrates.

Figure 7.69 Samples (image frames) coded by Substrate Group



Samples (image frames) coded by Substrate Group (level 3 of the substrate classification at L and level 4 at R)

7.4.4.3 Conclusions of Preliminary Habitat Mapping

The hierarchical physical and biological classification scheme used to log images appears to be suitably sensitive to detect gradients in megafauna community composition and relate these to physical habitat structure. Importantly, preliminary analysis indicated that high-level taxonomic identifications made using the formal scientific classification (e.g., phylum-level, which are often the only identifications possible from imagery) did not provide suitable resolution to detect differences. The concept of morphospecies identification has been adopted for megafauna in several contemporary marine studies and has been used in the CCZ for nodule-attached foraminifera, where formal taxonomic descriptions are not available (Kamenskaya et al, 2012; Veillette et al, 2007; Gooday et al, 2015).

Specific conclusions of the preliminary analysis are:

- Megafauna communities associated with nodule-free sediments differ from those associated with nodule-bearing sediments.
- Among the nodule-associated group, nodule facies (level 3 Geoform) as they were logged, was not a significant factor in structuring community composition. However, nodule density was significant.
- Based on the preliminary cluster analysis of Area B, a working hypothesis is supported for the existence of four benthic habitat types with respect to megafauna:
  - Sediment: nodule-free: smooth mud.
  - Sediment: nodule-bearing: high to very high density nodule-mud mixes.
  - Sediment: nodule-bearing: low to very low density nodule-mud mixes.
  - Rock pavement: sedimentary carbonate.

Populating Boosted Regression Tree models with additional data is expected to provide additional resolution on fauna distributions and provide a method for predictive habitat suitability modelling and thus support future impact assessment and spatial management of mining.

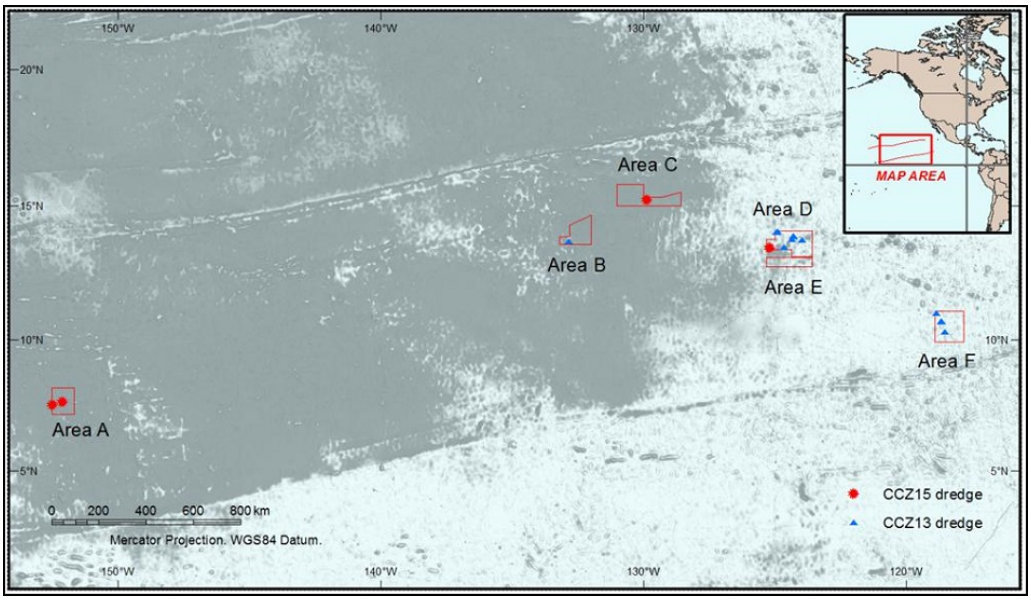
It is noted that the habitat mapping trial was done across a fairly restricted range of abyssal hill types (Physiographic Setting Subcomponent to Geoform Level 1 in Table 7-3) without any clear discrimination in biology between these types. This needs still to be reconciled with biological differences noted by Melnik and Lygina (2010) at Geoform Level 1 (their Striped, Undulated and Cloak type abyssal hills).

7.4.5 Other results

7.4.5.1 Dredging

Seventeen sites have been sampled either by epibenthic sled (CCZ13 campaign; Figure 7.30) or Galatea dredge (CCZ15 campaign; Figure 7.31).

Figure 7.70 Dredge sample locations CCZ13 and CCZ15



The samples were logged and:

- Sub-sampled extensively (up to 30 fragments per dredge sample) to confirm historical grades and to study variability in grade;
- Used in drying testwork;
- Used for metallurgical test work.

7.4.5.2 Towed Sonar - Side Scan

Sidescan sonar was used to map/characterise parts of several of the sub-areas for which an Indicated Mineral Resource is estimated. In effect these sub-areas are future options for TOML to conduct pilot, trial, and early commercial mining operations and are called Priority Mining Areas (PMA) in ISA terminology. An example of survey over the B5338 field within the B1 sub-area, is presented here.

In B5338 and the other areas, features of note on the side-scan and sub-bottom profiler can be classified into five categories:

- Texture relating to nodule coverage/size (and thus nodule abundance)
- Mapping of obstacles of concern in any future mining operation
- Detailed bathymetry (slopes and orientations of slopes)
- Textures and profiles relating to sediment types
- Features that imply a particular geological history.

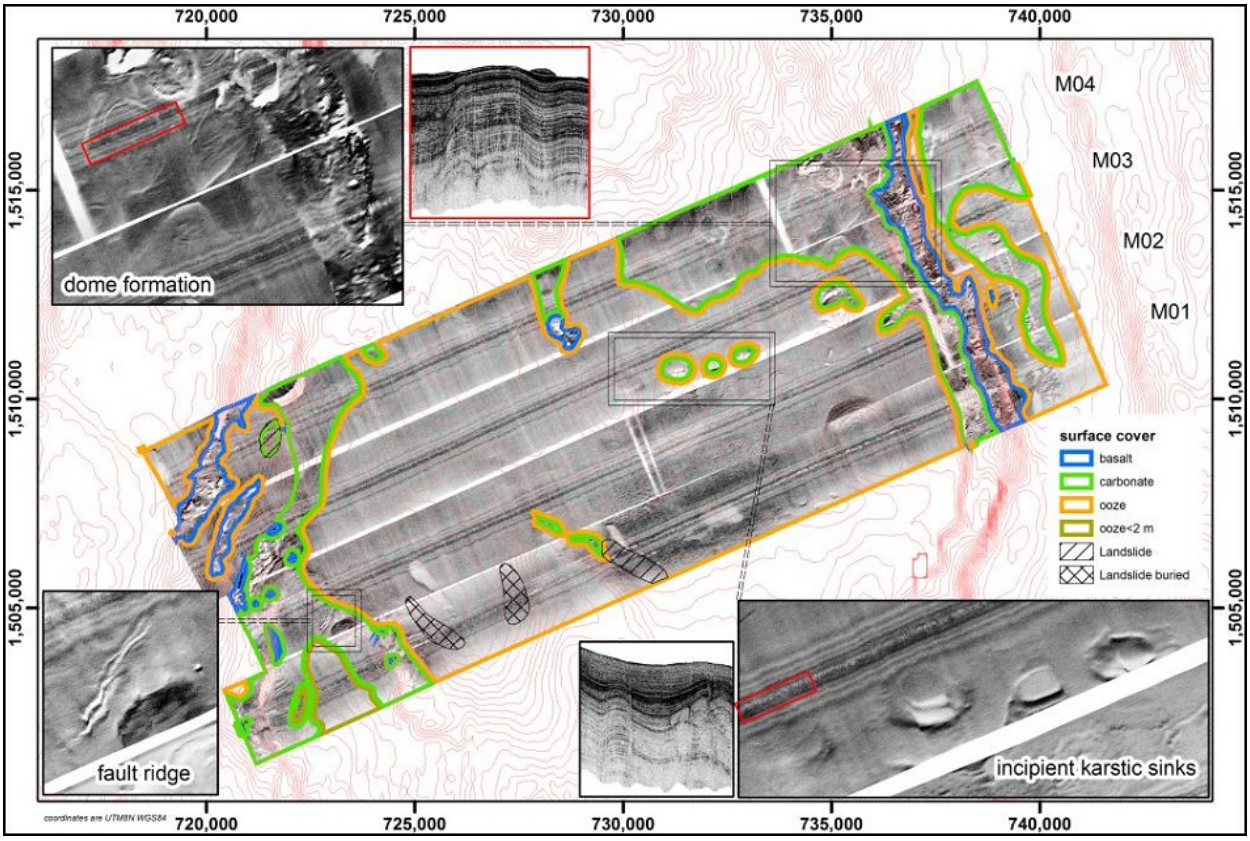
Nodule coverage in B5338 is consistent on the top of the ridge with a clear correlation with photo-profile coverage (Figure 7.52).

The most significant obstacles are the slopes defining the eastern and western boundaries of B5338, but there are also areas within the sub-area that could likely hinder a mining system. These include incipient karstic features and a basalt outcrop. There is also one steep small ridge as well as a small basalt floored karstic feature in the SW. Apart from these, however, the surface looks very smooth even with local ridge systems of several tens of metres altitude.

The sub-bottom profile data (not shown) show good development of a typical CCZ stratigraphy with thinning of siliceous ooze to the north.

In the northern area peculiar dome-shaped features (~1 km diameter) are visible on the
side-scan (Figure 7.71). These appear to be the result of block faulting. Sub-surface carbonate dissolution is indicated in the sub-bottom profiler at depth both in B5338 and in adjacent valley B4741 but these do not express at surface.

Figure 7.71 Side scan coverage and geological interpretation of the B5338 field, Area B1



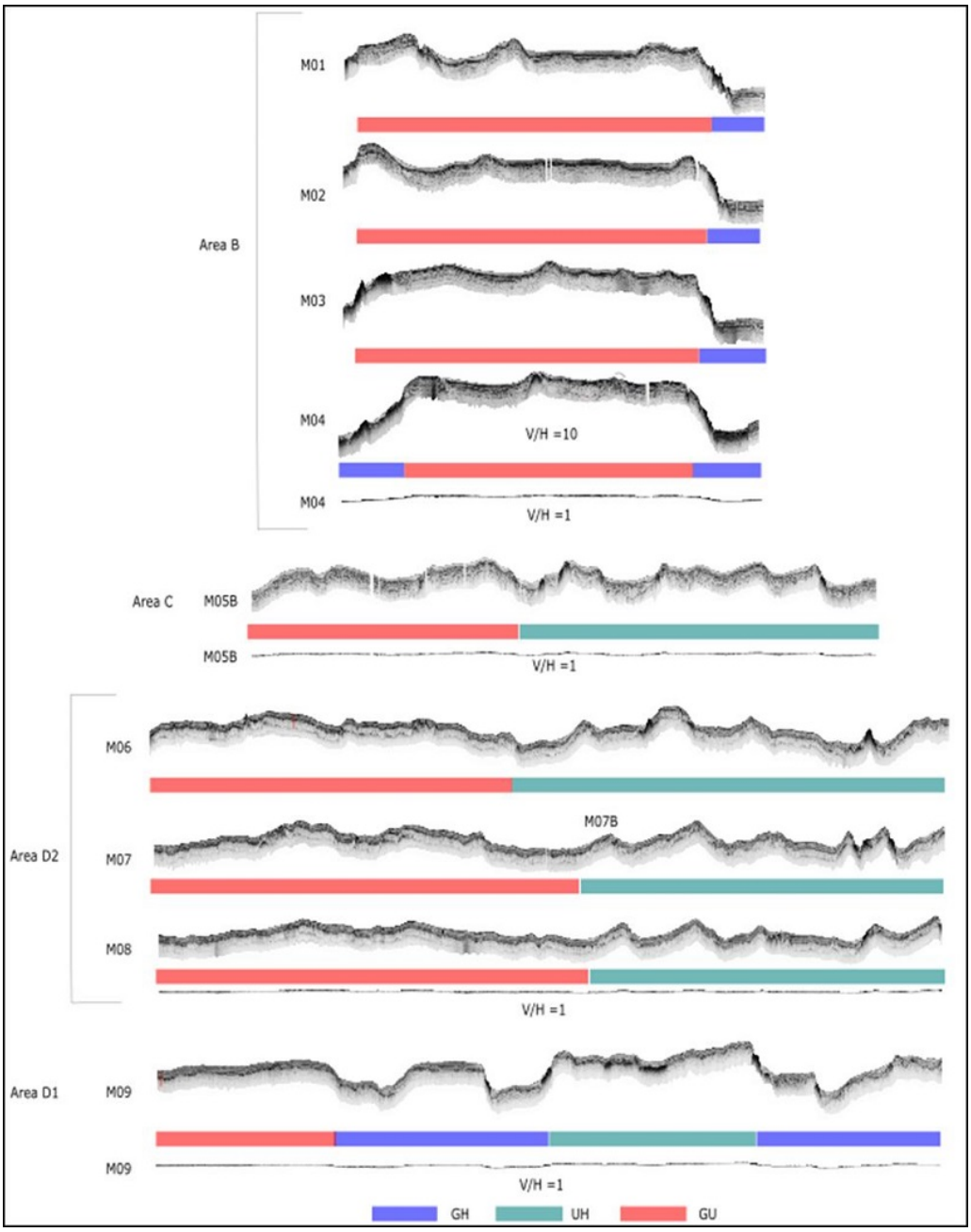
Swath is ~ 2km wide and sub-bottom profile thickness is ~ 100 m at V/H=10:1

7.4.5.3 Towed Sonar – Sub-bottom Profiler

The sub-bottom profiler was used to classify types of abyssal hills. Figure 7.72 shows profiles with three types of abyssal hill:

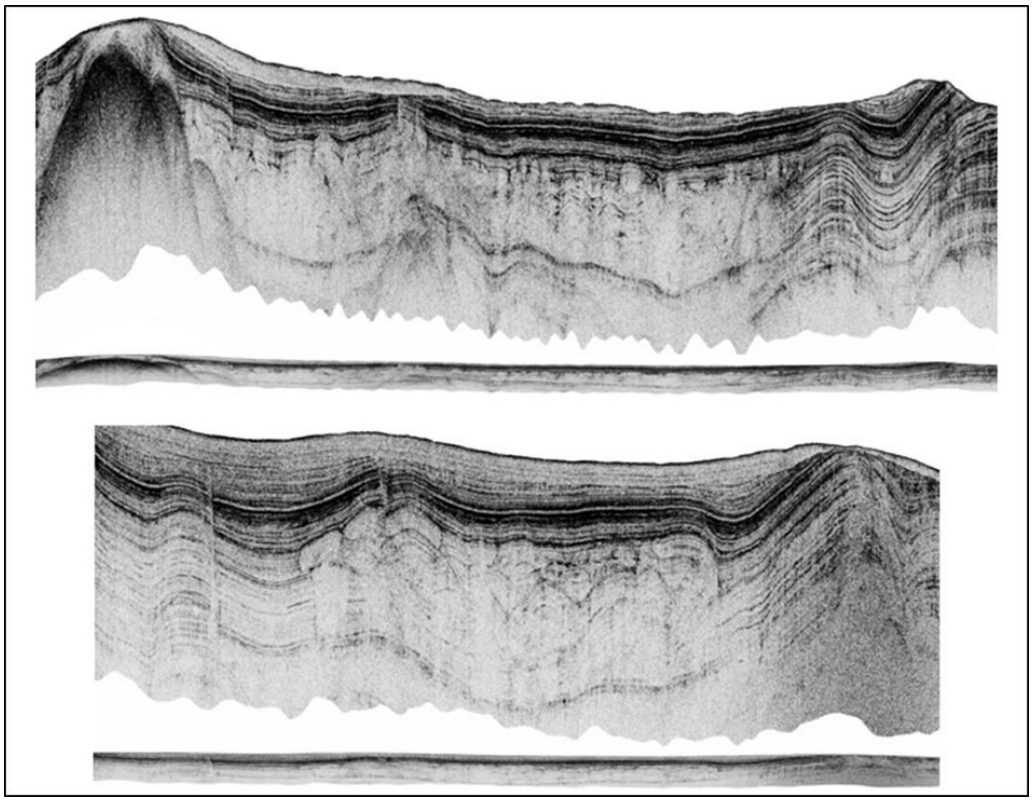
- GH stands for graben-horst and is the most rugged topography with fully developed grabens (valleys) and intermediate horsts (hills)
- UH stands for undulating hills and is less rugged than GH and typically includes half-grabens and warped rather than fault-blocked topography
- GU stands for gently undulating and is the most, gentle land form with warped gently undulating topography.

Figure 7.72 Abyssal hill classification from sub-bottom profiles



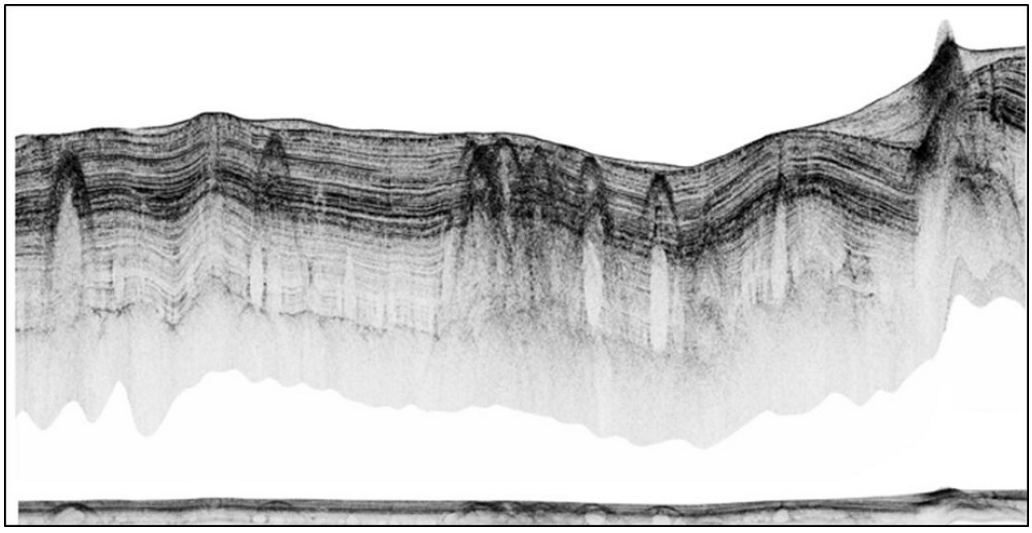
A range of other geological features can been seen on the sub-bottom profile sections, including faults, collapse features (probably related to a combination of faulting and carbonate dissolution; (Figure 7.73) and recent igneous activity including dykes (Figure 7.74) and sills (Figure 7.75). Of note are the “basin type” dissolution horizons that are found almost exclusively in grabens or down-warped areas. They have distinctly different sonar signature to the karstic features that typically form on hill crests.

Figure 7.73 Fault bound collapse-dissolution in carbonate



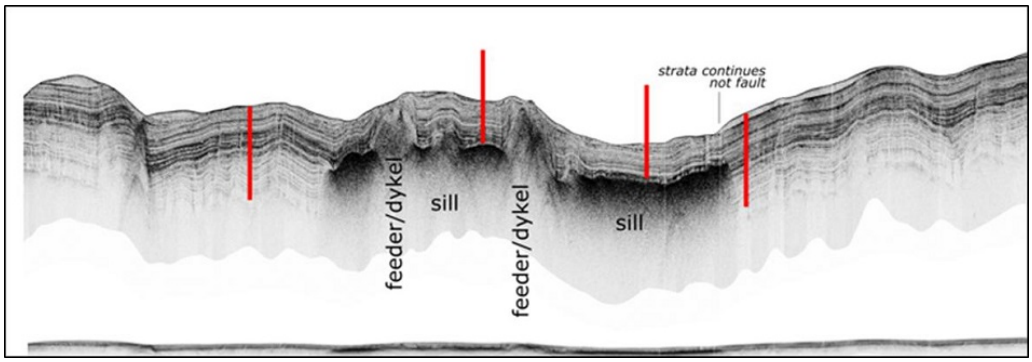
Profile is about 100 m thick: CCZ15-M04_(T), CCZ15-M03_(B) each section pair is V/H=10, and V/H=1

Figure 7.74 Possible dyke swarm in western subarea D 3454



Profile is about 100 m thick: (CCZ15-M06) section pair is V/H=10, and V/H=1

Figure 7.75 Possible late stage sill or peperite layer and feeders in DW0332, Area D1



Profile is about 100 m thick: section pair is V/H=10, and V/H=1

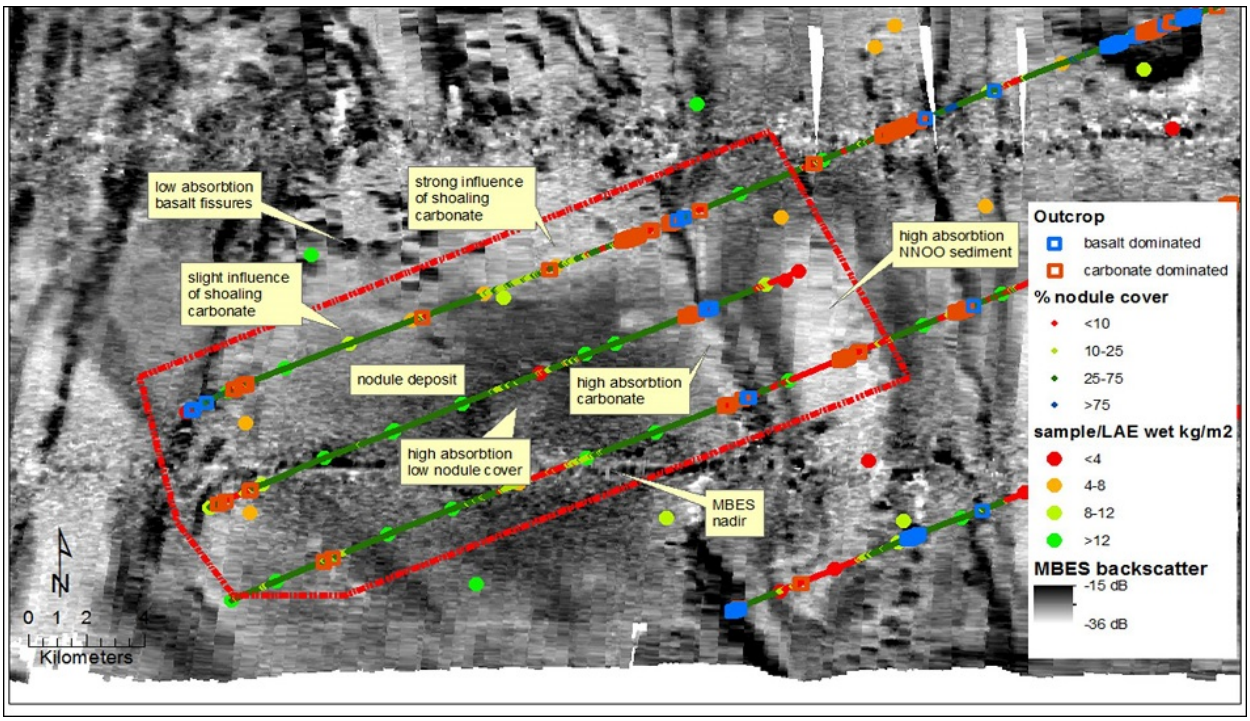
7.4.5.4 Relationship with backscatter

An indirect relationship between nodule abundance and acoustic response has been known for many years (e.g., ISA, 2010; Ruhlemann et al, 2011), and this was confirmed by the results of the two TOML campaigns. Essentially the backscatter response (or reflection) can be used in many cases to discriminate:

- Rock from sediment
- Sediment types (e.g., Calcareous versus siliceous)
- Sediment with or without nodules
- Sediment with larger or smaller nodules (and larger nodules often result in higher abundance).

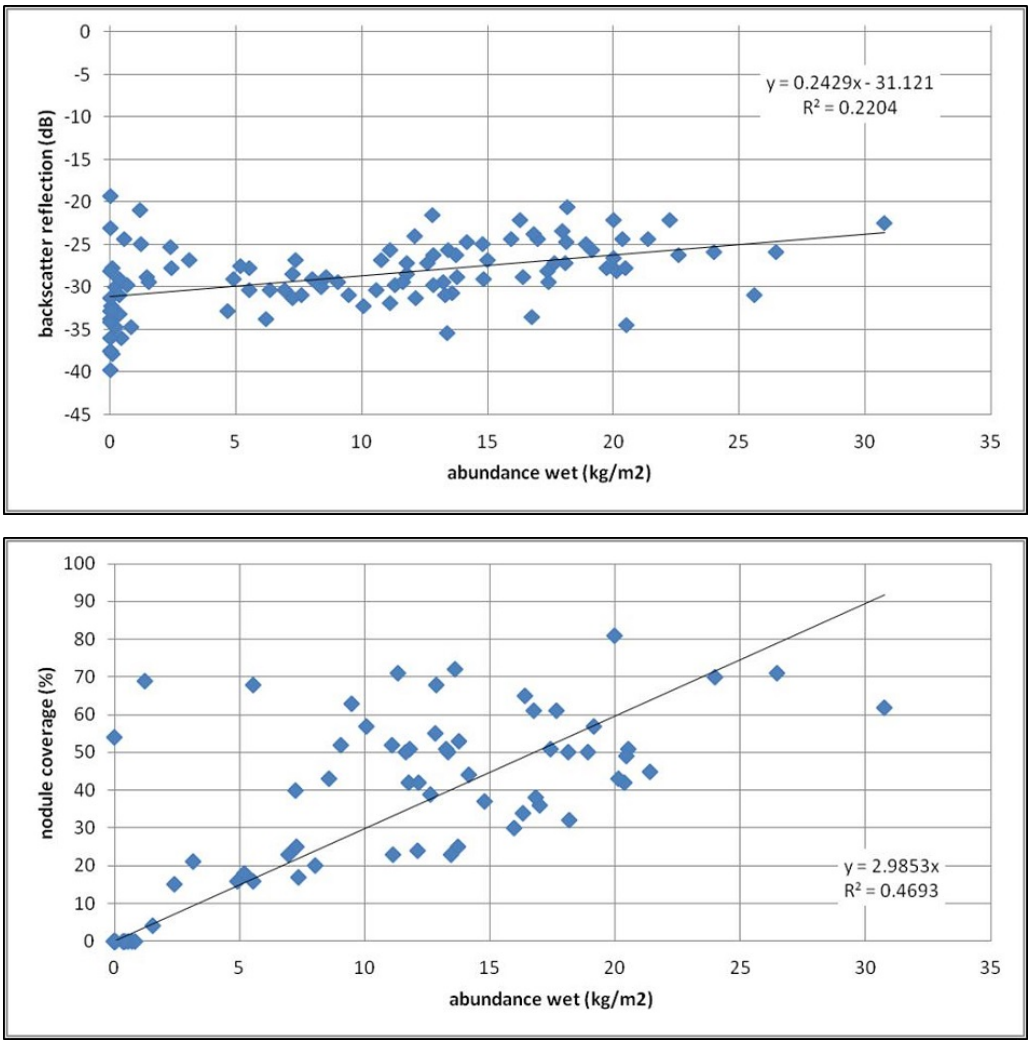
An example of characterisation is illustrated in Figure 7.76 and this response played a role in the map shown in Figure 7.71. The continuous nature of the nodules is evident from both acoustics and photo logging. Figure 7.77 quantifies the fair correspondence between abundance and acoustic reflectance and abundance and nodule coverage for TOML area B1.

Figure 7.76 Characterised MBES backscatter response in B5338



Nodule cover from photo-profile lines ~3.5 km apart.

Figure 7.77 Relationships between abundance and acoustic reflection and nodule coverage



Area B1, include long-axis based estimates of nodule abundance

8 Sample preparation, analyses and security

8.1 Historical preparation, analysis and security

8.1.1 Historical sample preparation

The sampling programmes undertaken by previous explorers in the TOML tenement area, which comprise an important data set used here for resource estimation, include Japanese, French, and Russian data sets. In 2012, independent consultants Golder Associates (Golder, 2013) sent requests to the agencies responsible for each of these data sets but only received partial responses from Yuzhmorgeologiya (Russia; TOML Exploration Area B) and DORD (Japan; TOML Exploration Areas A and D) which are included below.

A Golder Associates subcontractor, (Dr Charles Morgan) had been previously directly involved with one of the US exploration programmes (OMCO) that was carried out during the same period as these other programmes, working as a Senior Scientist for Lockheed. This work included direct participation in resource assessment survey expeditions to the CCZ and development and implementation of sample preparation and analysis procedures. The description of sample preparation and analysis methods provided below is based on this experience.

Prior to establishment of the ISA, explorers working under different jurisdictions settled claim boundary overlaps through a process of negotiation and data exchange (e.g., NOAA, 1987). Though data were generally not exchanged until after negotiations related to exploration claim boundaries were completed, Morgan conferred with representatives of these consortia at several formal professional meetings and informal settings, comparing methods and procedures used for sample collection, analysis, and quality control. Many aspects of the OMCO procedures were used by the other explorers.

As described below, documentation of sample treatment methods has been provided by Professor Valeriy Yubko, Deputy Director of the Russian oceanographic institution Yuzhmorgeologiya, based in Gelendzhik, Russia and operating under the jurisdiction of the Russian Federal Agency of Natural Resources. Professor Yubko was a senior member of the Russian team that explored for polymetallic nodule deposits in the CCZ and delineated the Yuzhmorgeologiya exploration claim under the ISA. As shown in the following sections, the Russian methodology was very similar to the methodology practiced by the Lockheed group. Some details have also been provided by Dr Okazaki on the DORD sampling and analytical procedures. Dr Okazaki is current exploration manager for the CCZ nodule field for DORD. Ongoing use of wet weights for abundance by the BGR is also explained below.

8.1.1.1 OMCO procedures

Polymetallic nodule samples collected with FFG samplers were transferred directly from the sampler into individual plastic bins and carried below deck to the geochemical laboratory. In the laboratory they were laid out separately on a white surface marked with a scaled grid and photographed to permit determination of nodule size distribution. They were then sealed in labelled fibreglass-reinforced collection bags and stored in the ship’s hold for the balance of the exploration campaign.

The bins and lay-out surface were cleaned between samples using filtered seawater and dry paper towels. No cleaning of the nodules was usually necessary, since any mud adhering to them would be swept off the nodule surface through the open mesh of the sampler collection net during the ~4,500 m ascent from the seafloor. Samples collected with box corers were processed in a similar manner, except that the adhering mud had to be rinsed off each nodule as it was removed from the box corer.

The collected sample bags were transported from the ship that almost always docked at a pier in San Diego Bay, to the Lockheed Ocean Laboratory, which was also located on the Bay at Harbor Island. Transfer of the samples from the ship to the secured laboratory storage facility was the first priority when the ship came to port and was always handled personally by the expedition crew and other Lockheed employees.

Prior to weighing, the samples were removed from the sample bags and placed in a single layer in labelled, open trays on tables in the air-conditioned laboratory for at least 12 hours to ensure a uniform degree of air drying. The samples were then weighed using a high-capacity laboratory scale and divided into two subsamples of approximately equal weight. As a portion of the nodules was to be kept uncrushed, the technicians were instructed to ensure as much as possible that both subsamples contained similar nodule size distributions to the original samples. One subsample was placed in a labelled jar and kept as a permanent archive. The second subsample was prepared for Atomic Absorption Spectrographic (AAS) analysis, as described below. This is a potential source of sample bias but OMCO minimised this risk by randomly selecting which sample was used for archive.

The second subsample was crushed using a jaw crusher (similar to the Retsch™ BB51 currently available; see Retsch, 2012) to produce a product with a maximum size of less than about 1 mm. The crushed sample was then mixed using a 3-axis shaker to achieve uniform mixing and to preclude any separation of the less dense detrital (siliceous) component from the more dense metal oxide component of the sample. The mixed sample was passed through a laboratory sample splitter as required to produce a 5 to 10 g subsample for AAS analysis. The remainder of the sample was then stored as a second, crushed archive sample. The subsample was further ground to a fine powder using a laboratory ball mill prior to assaying.

The powdered subsample was placed in a 110 °C drying oven for at least 6 hours to remove adsorbed water. It was then immediately transferred to a sealed desiccator to cool to ambient temperature. Cooled samples were weighed using a Mettler™ analytical balance and then transferred to Parr™ Teflon-lined high pressure digestion vessel. Reagent grade hydrofluoric, boric, and hydrochloric acids were introduced to the vessel, which was then sealed and heated for several hours to complete the digestion. The digested samples were then diluted as necessary with filtered, distilled water for AAS analysis using a Hewlett-Packard instrument. Standard analysis included determination of Mn, Fe, Co, Ni, Cu, Zn, Si, Ca and Mg.

Analytical accuracy was confirmed by periodic introduction of standards made from crushed, mixed, and powdered bulk nodule samples that had also been sent to three independent commercial laboratories for determination of these metal contents. Additional confirmation was achieved using standards formulated by the U.S. Geological Survey (A-1 and P-1; see Flanagan and Gottfried, 1980). These standards were subjected to the entire preparation procedure to ensure that no significant contamination was occurring and that no systematic analytical errors were being included in the process.

8.1.1.2 Yuzhmorgeologiya procedures

The measurement of abundance of nodules at the sample site was carried out using an ‘enclosed’ Ocean-0.25 grab sampler (Figure 8.1) with a 0.25 m^2 gripped surface and a depth of sampling of approximately 30 cm. The grab sampler was combined with GFU-6-8 photography unit. This device takes ocean bottom photos at the sampling point.

Figure 8.1 Ocean-0.25 Grab Sampler (Yubko, 2012)

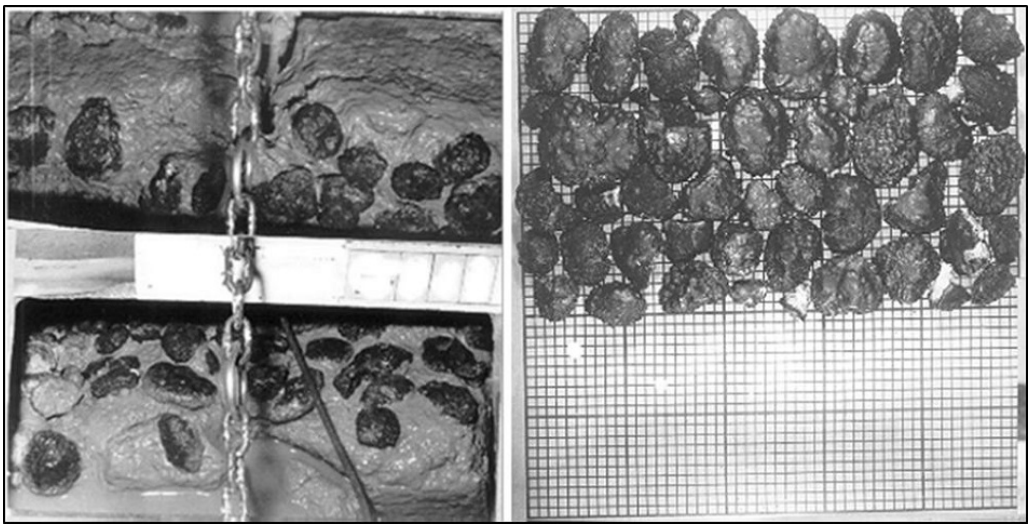


The procedure for sub-sampling was:

1. Extraction of all nodules from the grab sampler (Figure 8.2).
2. Crushing of all nodules to a maximum particle size of up to 10 mm.
3. Drying (approximately 24 hours) of all samples at 105 °C until constant weight was achieved.
4. Crushing of all samples to 1 to 2 mm particle size and splitting of 400 to 500 g using a splitting device.
5. Pulverizing of the split sample (not less than 400 g) was carried out in the vibrating grinder up 100 mesh particle size (0.074 mm).
6. Formation of analytical sample (200 g) and its duplicate (200 g).

Chemical analyses were carried out on sub-samples with an approximate weight of 0.5 g, selected from the analytical sample. Determination of Ni, Cu, Co and Fe content was carried out by AAS and the content of Mn by a method of photometric (electrometric) titration.

Figure 8.2 Mn-nodules Inside Grab Sampler (left) and Outside Grab Sample (right) (Yubko, 2012)



8.1.1.3 DORD procedures

DORD's procedure for sampling (Okazaki, 2012) is understood to include:

- Each sample station is a combination of three sub-sampling points which effectively form an isosceles triangle with lengths of sides 1.4 nm, 1.4 nm and 2.0 nm.
- Collection was mostly by free fall grab, but at occasional stations a box corer was used at one of the three sub-sample points.
- In later campaigns at least (which may not include the TOML Exploration Area) a ship-borne X-ray fluorescence analyzer was used for the chemical analysis with some representative samples being assayed at an on-land laboratory to assess precision and accuracy.

8.1.1.4 BGR procedures

Ruhlemann et al. (2011) describe the sediment and nodule sampling process used by the BGR in recent times (2006) which is largely not relevant to the Pioneer Contractor data from the TOML Exploration Area. One exception however is their citing the ongoing use of a BGR procedure in the 1980s of washing sediment from collected nodules with specially cleaned seawater before determining their wet weight and converting this to a dry weight by means of a simple 30% reduction factor.

8.1.2 Historical Quality Assurance and Quality Control procedures

No systematic QAQC information is available as this information was not provided to the ISA. QAQC was known to be undertaken at the time of sampling as part of the scientific process used by each consortia (country). Data quality was assured using comparative measures between the different datasets (section 7.1.1) to prove that the samples within the TOML Exploration Area were not statistical outliers. This level of quality assurance was deemed suitable for a Mineral Resource at an Inferred level of confidence.

As part of the requirements by ISA, the Pioneer Contractors were required to relinquish half of their claim to the ISA as reserved blocks. During this process the ISA reviewed the sampling data to ensure that the splitting of the claim was even with equal abundance and grade occurring in the retained portion of the claim and the parts being relinquished. As such, the ISA has accepted the data (and quality) supplied by the Pioneer Contractors.

8.1.3 Historical adequacy of sample preparation, security and analytical procedures

Free fall grab samplers consistently underestimate the actual abundance but provide samples that can be used to determine adequate estimates of the grade of the surface nodules (Hennigar, Dick and Foell, 1986). Even today they are the most efficient tool available for sampling the nodules at the seafloor. This is because a number of them can be deployed at any one time from the survey vessel allowing an order of magnitude greater speed in collection i.e. approximately 10 to 20 samples per day for a FFG versus 2 to 3 samples per day for a BC that is winched to and from the seafloor.

In many cases, it is unknown exactly when the nodule weights have been taken by the Pioneer Contractors. Thus it has been assumed that the samples were weighed shortly after recovery on board the exploration vessels (or back at base) and usually before any splitting or crushing. This partial assumption is more conservative in any tonnage estimate than the alternative that the abundance weights are for dried nodules. It also fits well with Dr Charles Morgan's experience with sampling in the CCZ and the process description provided by Yuzhmorgeologiya.

Overall, the comparison of the sampling and assaying between the Pioneer Contractors show that the data are adequate for geological modelling and are reliable for Mineral Resource estimation at an Inferred level of confidence. This is supported by the very similar grades obtained in the TOML sampling.

8.2 TOML preparation, analysis and security

8.2.1 Sample Chain of Custody

Refer also to Section7 regarding TOML's exploration programme, including sampling methodology.

For box-core samples the Primary Sample handling from sample tube handover to lab was managed only by the TOML ship-based science team under the supervision of one Chief Scientist and two Lead Scientists.

Primary Samples were weighed on deck or in the lab (preliminary weight), washed, weighed again (washed weight) and then moved to the main lab and stored in an exclusive designated area.

At periodic intervals Primary Samples were laid out by Chief Scientist and the Lead Scientist Responsible in the main lab (which was closed to all other people during the process). After air-drying to remove surface water, the Primary Samples were weighed again (air-dried weight; used for abundance estimation for the Mineral Resource estimate) and then some samples were split for Field Duplicates by cone and quarter and for all samples by picking for Reference Samples (~1–6 nodules proportional to the sample size). The sample remaining after these splits were removed is the Main Sample, and the chemical analysis of this was used to support the grade estimation for the Mineral Resource estimate. Weight estimates were recorded on a dedicated written log by the Lead Scientists and Chief Scientist, with scanned backups, and then typed into a master Excel spreadsheet by the Chief Scientist. Recorded washed weights were included in the Daily Progress Reports sent to the head office.

Main samples were then sealed using tamperproof tape or tags into specially marked drums that were sealed with tamperproof tape. The drums were escorted by the Chief Scientist or Lead Scientist Responsible to a storage reefer on the deck of the vessel. The reefer was repacked twice during the voyage due to processing of biological samples and to aid quarantine clearance, with only partial supervision at this stage by the Chief Scientist or Lead Scientist Responsible.

On arrival into port (Panama), the container was sealed by the Chief Scientist using a padlock. Spare keys were held by the agent in case inspection was needed, but in the end, this was not required. The Field Duplicates were couriered to the specialist laboratory at Jacobs University Bremen and the Reference Samples were couriered to the Brisbane office of TOML parent company Nautilus Minerals.

The Field Duplicates were received by Laboratory Staff at Jacobs University, prepared at the BGR laboratory in Hannover and analysed using ICP at Jacobs. Results were emailed in an excel spreadsheet to the Chief Scientist.

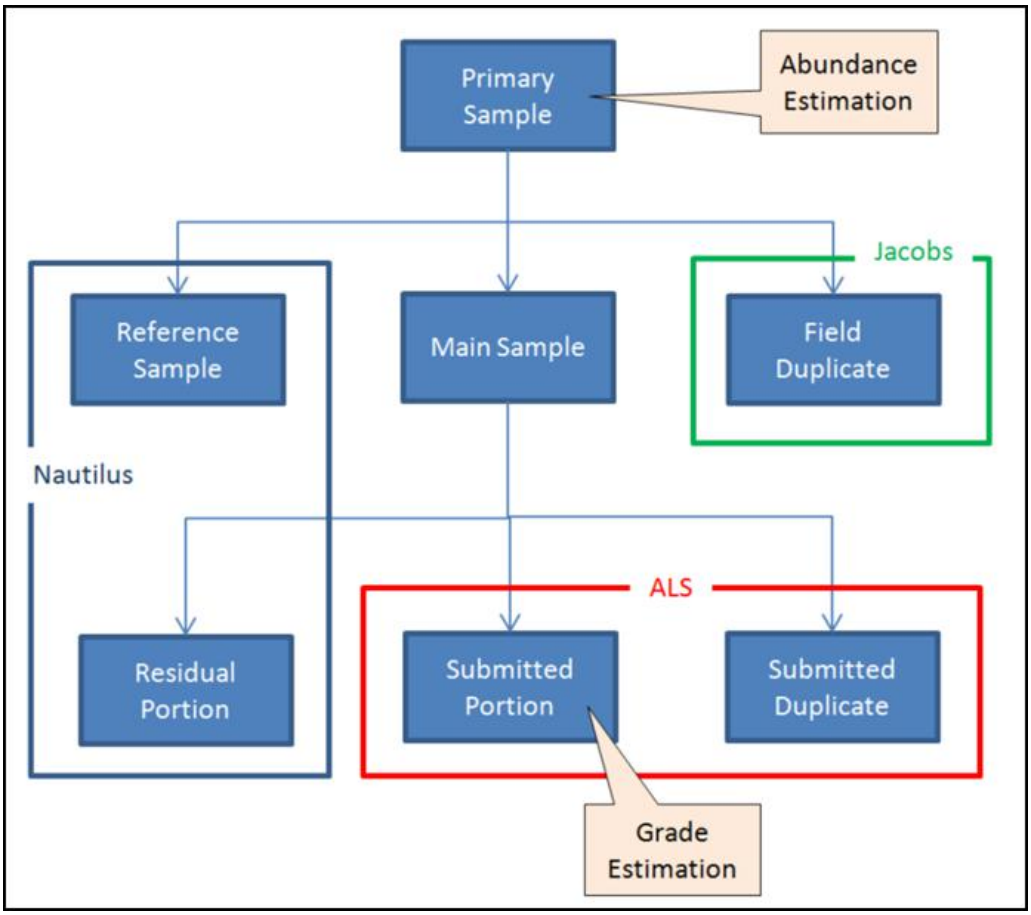
On arrival of the container into Brisbane (where the analytical laboratory is located), the opening of the container was supervised by the Mineral Resource Qualified Person. The drums were inspected and all tamperproof tape was intact. The drums were collected by an employee of Australian Laboratory Services and transported to their lab in Brisbane.

At the laboratory, the Mineral Resource Qualified Person and an assistant cone and quarter split the Main Sample again; for all samples a Submitted Portion was taken for crushing, grinding and chemical analysis, and for samples of sufficient size a Residual Portion was retained for storage. For some samples a Submitted Duplicate was also collected. The Submitted Portion and Submitted Duplicate were prepared then analysed by ALS in Brisbane using XRF (details below) and the results emailed as datasheets in excel format and by certificate in pdf format to the Chief Scientist. ALS maintain certified sample handling systems (see below) with step by step monitoring, which can be produced/interrogated on request. This includes the use of Blanks, Laboratory Duplicates and Certified Standards. Processed pulps of the submitted portion and submitted duplicate are stored at ALS for the moment. The Residual Portion was collected from ALS by TOML staff and stored in Nautilus Sample Repository in Virginia, Queensland, where it has been used for characterisation test work.

Chemical data received by the Chief Scientist is stored in raw format on a server and captured with relevant sample information within a Nautilus Acquire database system.

Sample COC is summarised in Figure 8.3. Chain of Custody for the abundance estimation has been overseen by Chief Scientist and the two Lead Scientists. Chain of Custody for the grade estimation extends from them to the Mineral Resource Qualified Person and ALS Staff. The Chief Scientist is also serving as Qualified Person for Geology and Mineralisation and for Deposit Types.

Figure 8.3 COC sample flow (box-core samples)



Process for the dredge samples was simpler as their results do not inform the Mineral Resource estimate. In both the CCZ13 and CCZ15 campaign dredge-variance sub-samples Submitted Portions were sent to ALS and Field Duplicates were sent to Jacobs. The dredge samples are bulk samples (between 40 and 800 kg) so the Reference Sample is the bulk of the material. There is no Residual Portion or Submitted Duplicate involved in the dredge samples.

Jacobs was selected as the check laboratory as it has a long history of working with nodules, including considerable work on REE. Jacobs does the analyses for the German Contractor (BGR). Samples were analysed by a combination of ICP-MS and ICP-OES.

ALS was selected as the main laboratory as it has full commercial QAQC procedures in place and is expert in analysing manganese ores. Samples were analysed by both fused disk XRF (for reported Ni, Cu, Co, Mn) and ICP-AES for trace and minor elements.

8.2.2 Laboratory analysis methods

8.2.2.1 ALS

ALS Laboratory Group in Brisbane, Australia has extensive experience in the analysis of high manganese materials by the XRF method. ALS operates quality systems based on international standards ISO/IEC17025:1999 “General requirements for competence of calibration and testing laboratories” and ISO9001:2000 “Quality Management Systems - Requirements”.

ALS-Brisbane described their preparation processes as:

Samples are sorted into sequential order. Samples are then transferred to barcode labelled aluminium trays and loaded onto trolleys which are placed in a large natural gas fired oven for drying. Oven temperature is a maximum of 105 degrees but more typically, temperature is ~90 degrees. After drying, samples are jaw crushed in a Jacques jaw crusher to bring particle size to less than 10mm. Assuming samples weigh less than 3 kg, the crushed samples is then pulverised in an LM5 mill to a powder with typical particle size >85% passing 75um. Very small samples are pulverised in a smaller bowl using an LM2 mill.

Firstly for our fusion / XRF method, it is standard practice for us to:

- Place an approximate 0.33 g aliquot into a glass vial, which is then placed in an oven at 105 degrees for a minimum of 1 hour (usually more);
- The sample is then removed from the oven and immediately weighed in the vial (still warm);
- The dried sample is then transferred to the tared platinum crucible for fusion.

Note that our XRF26s procedure is specifically designed for difficult to fuse chromite and manganese ores, hence the small aliquot.

Our normal procedure for our ICP method is not to re-dry samples after the initial drying prior to crushing and pulverising. Nautilus originally specified a drying temperature of only 90 degree Celsius. However when we initially compared the nodule elements that had been reported both by XRF and ICPAES, in general, the XRF results were higher. We realised from some drying testwork we were doing and our experience with bauxites and nickel laterites that was likely due to reabsorption of moisture. We then went back and:

- Placed the boxes of pulverised samples in paper bags in an oven for 6 hours at 105 degrees;
- The box was removed from the oven prior to weighing the sample aliquots and one by one each sample was weighed.
- There was no dessication and the last few samples in the box may have been out of the oven for almost an hour prior to being weighed.

This in general resulted in ICPAES results much closer to those reported by XRF.

ALS supplied analytical data by chromite/manganese ore fused disk XRF method (ME-XRF26s) for all samples:

- LOI, Al_2O_3, BaO, CaO, Cr_2O_3, CoO, Fe_2O_3, K_2O, CuO, MgO, MnO, Na_2O, P_2O_5, SO_3, SiO_2, NiO, TiO_2, PbO, ZnO

They also supplied data by high grade four acid ICP-AES method (ME-ICP61a) for select samples (including all box-cores):

- Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, Zn

Many of the above elements were at levels below the detection limit of ME-ICP61a.

8.2.2.2 Jacobs

Jacobs is the Laboratory operated by the Integrated Environmental Studies Program Group, Earth and Space Sciences Program, at Jacobs University in Bremen, Germany. This group has been involved in nodule analysis and study for over 10 years and have been integral to much of the development of nodule standards used in the industry. They describe their preparation as follows:

> The Fe-Mn nodules provided were powdered. In case of small sample bags the whole material was first crushed and then homogenized and powdered in an achate ball mill. Material provided in large (several kilograms) sample bags was first crushed and then splitted using a riffle splitter. One representative sample split (100-200 g) was then homogenized and powdered using the achate ball mill.

For sample decomposition, the nodule powders were dried for approximately 12 hours at 105 °C prior to digestion. Precisely weighed 50 mg aliquots of each dried sample were digested in 30 ml PTFE (polytetrafluoroethylene) pressure vessels using a PicoTrace DAS acid digestion system (Bovenden, Germany). The dried powders were dissolved with ultrapure concentrated acids, initially with 5 ml of a mixture of hydrochloric (HCl), nitric (HNO_3), and hydrofluoric (HF) acids (ratio of 3:1:1, respectively), at 180 °C for 12 hours. After cooling, samples were evaporated at 120°C for approximately 2 hours to near dryness, re-dissolved with 3 ml 20% HCl and heated again at 120 °C to near dryness. The residues were taken up again in 3 ml 20% HCl and heated at 120 °C to near dryness. Finally, the residues were diluted to 50.0 g in 0.5 M HNO_3 / 0.05 M HCl and immediately analyzed.

Major and minor element analysis was carried out using Inductively Coupled Plasma Mass Spectrometry (ICP-MS, Perkin Elmer NEXION 350X quadrupole instrument) for the determination of REE, Y, Sc, Ti, Rb, Zr, Nb, Mo, Cs, Ba, Hf, Ta, W, Pb, Th, U, while Fe, Mn, Mg, Ca, Na, Al, P, Sr, Cu, Co, Ni, Zn, V were determined with Inductively Coupled Plasma Optical Spectrometry (ICP-OES, SpectroCiros SOP instrument).

Accuracy and reproducibility of chemical analyses were checked with the certified reference materials Nod-P-1 (USGS). The measured concentrations are in very good agreement with published data (Table 2), proving the accuracy of the analytical methods. We also report the method precision of the ICP-MS and ICP-OES measurements, which is defined as the precision of multiple sample decomposition and measurement of a reference standard as % relative standard deviation (%RSD). The method precision of the ICP-MS measurements is generally very good and better than 2 % for all elements of the reference standard NOD-P1 (n=4), except for Rb (3%) and Ta (9%). Method precision of ICP-OES is better than 2% for most elements, except for Ca, Co, Li, Ni, and V (<3%) and for P and V (<5%).

Jacobs thus supplied data by single acid (0.5M HNO_3) ICP-OES for all samples:

- Al, Ca, Co, Cu, Fe, K, Mg, Mn, Na, Ni, Sr, V, Zn

They also supplied data by 0.5M HNO_3 ICP-MS for selected samples:

- Li, Be, Sc, Ti, Rb, Y, Zr, Nb, Mo, Te, Cs, Ba, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Pb, Th, U

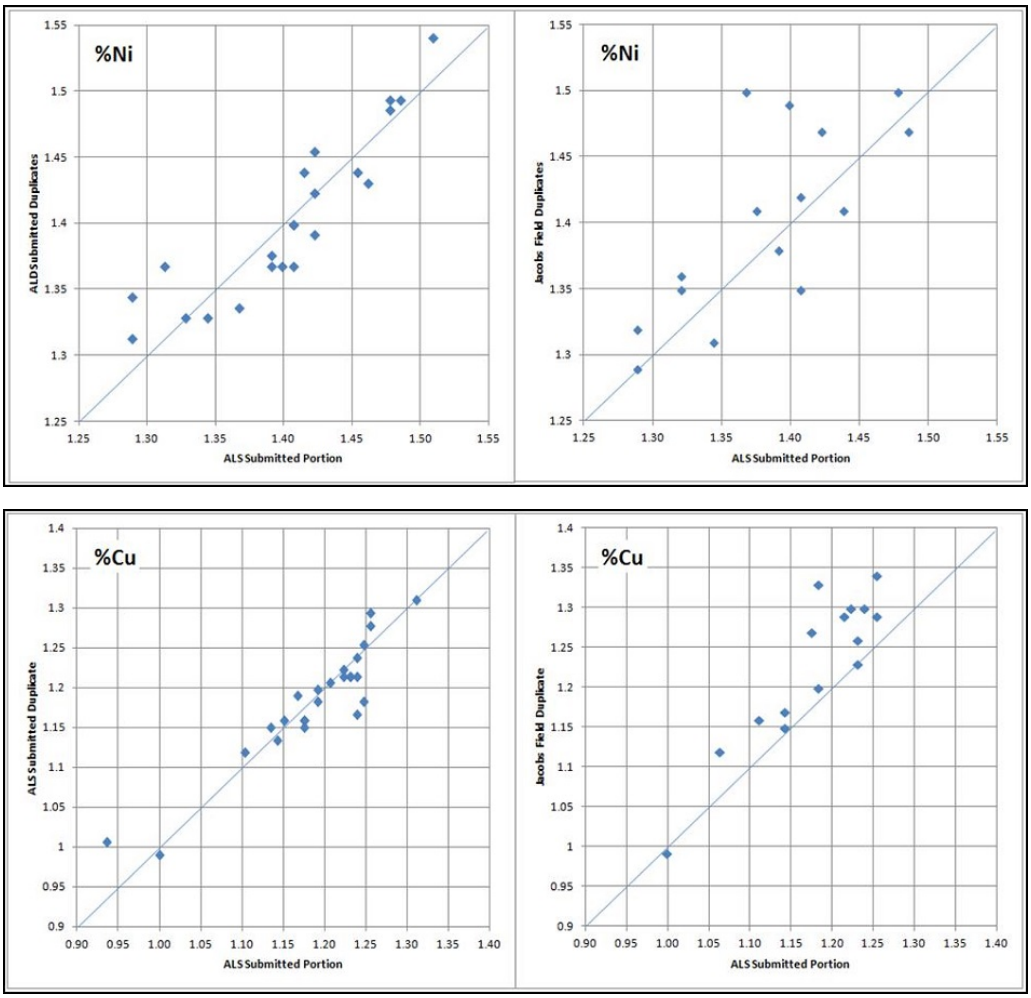
8.2.3 TOML Quality Assurance and Quality Control procedures

For the 104 box-core Submitted Portion samples submitted to ALS, 34 were duplicated (32.6%) with:

- 25 Submitted Duplicates to ALS (24.0%); and
- 15 Field Duplicates to Jacobs (14.4%).

Six Submitted Portion samples were duplicated both as Submitted Duplicates and Field Duplicates (5.7%).

Figure 8.4 Comparison of Nickel and Copper grades in duplicates



Field Duplicates from the box-core Primary Samples were produced using the cone and quarter technique once the final air-dried weighing step was completed.

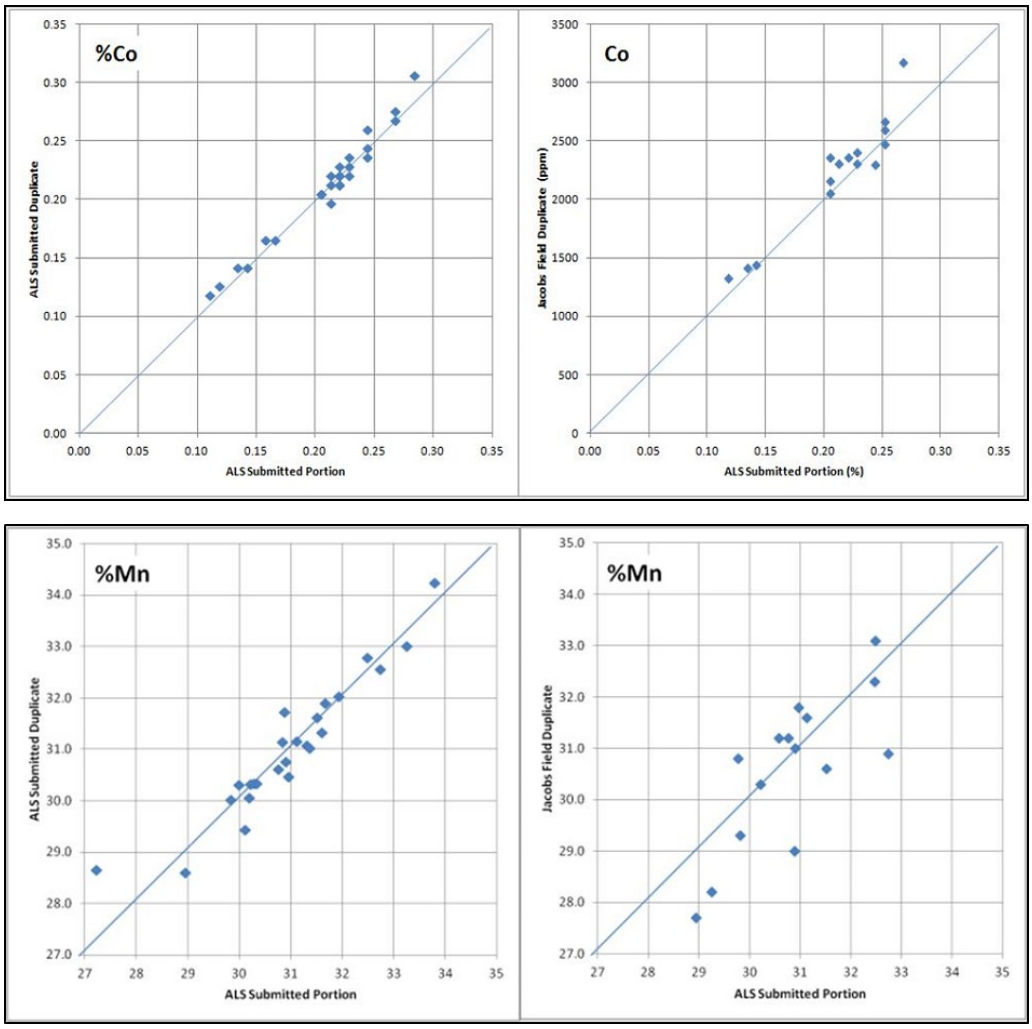
Reference samples from the box-core Primary Samples were taken at the same time but were selected on the basis of preference for entire nodules over a range of sizes and textures (if such a range was present) with an intent to include the most common forms of nodules.

Submitted Duplicates from the box-core Main Samples were produced using the cone and quarter technique.

Dredge “variance” samples were picked from all sides of the dredge pile with an attempt not to bias based on size or form. Dredge “variance” sample Field Duplicates were taken by snapping picked samples in half. These results give a good indication of the degree of inter-sample variance that might be expected.

Comparisons of duplicate results for Ni, Cu, Co and Mn are illustrated in Figure 8.4 and Figure 8.5. With Half Relative Difference analysis in Table 8.1 and Table 8.2.

Figure 8.5 Comparison of Cobalt and Manganese grades in duplicates



All Submitted Duplicates correlate very well with their Submitted Portion pairs). Field Duplicates correlate well with their Submitted Portion pairs except for high copper samples (bias high to Jacobs) and maybe low grade manganese (but the number of samples is too few to be sure and the relative difference is low; Table 8.2).

Table 8.1 Half Relative Difference Submitted Portions and Submitted Duplicates

	Co	Cu	Mn	Ni
Min	–3.44	–3.70	–2.55	–2.09
Max	3.84	2.99	1.13	1.42
Mean	–0.455	0.0995	–0.0506	0.0131

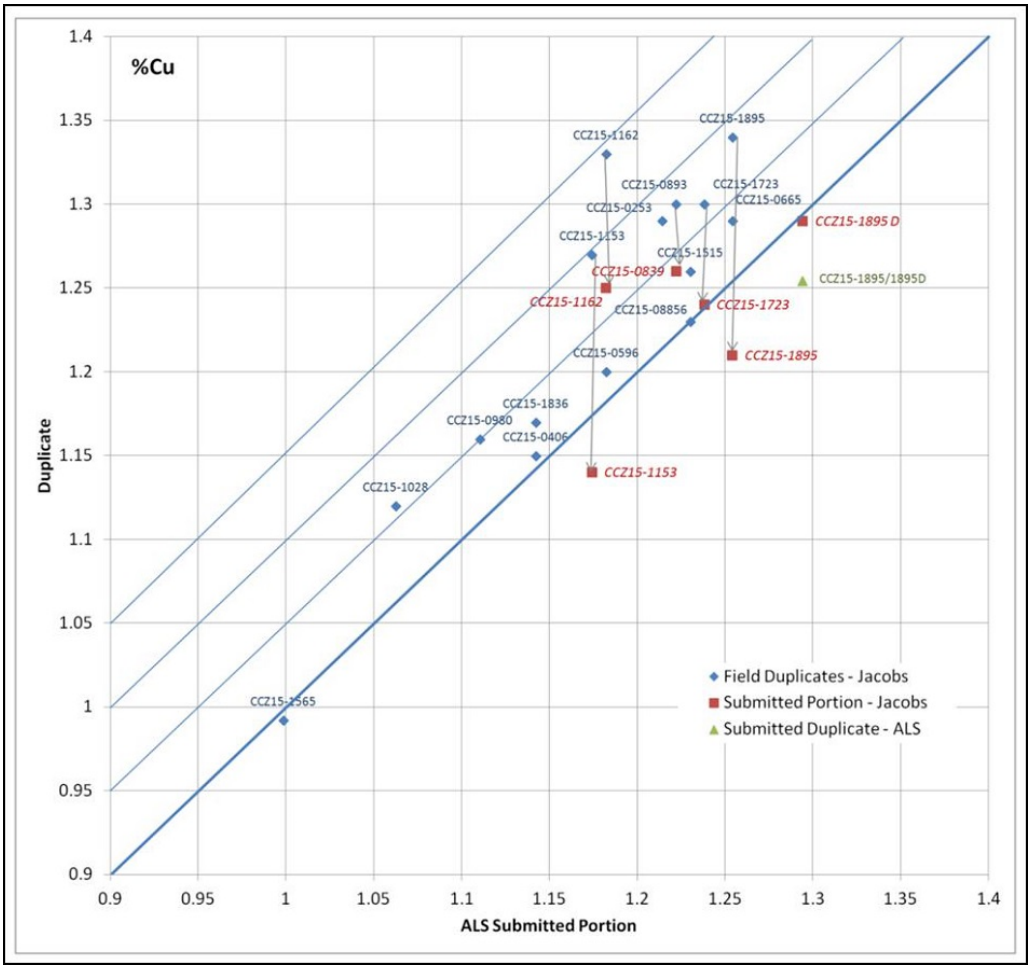
Half Relative Difference = difference between samples divided by their mean and times 0.5 and times 100

Table 8.2 Half Relative Difference Submitted Portions and Field Duplicates

	Co	Cu	Mn	Ni
Min	–8.62	–5.88	–1.70	–1.09
Max	2.93	0.330	3.15	50.0
Mean	–2.70	–2.07	0.399	30.0

Field Duplicates sent to Jacobs (analysis by ICP) generally compare very well with Submitted Portion analysed by ALS (XRF) with the exception of high copper samples (Figure 8.6), where there appears to be a bias of the order of 0.05 to 0.1 % Cu with Jacobs reading higher than ALS. On a relative basis this difference is not severe (Table 8.2).

Figure 8.6 Comparison of high grade copper duplicates



Selected high copper samples were reanalysed with additional standards by ALS without appreciable difference, then an aliquot of the Submitted Portion pulp was sent to Jacobs. Jacobs analysis of these aliquots is in broad agreement with the ALS results, indicating either contamination of the Field Duplicates during preparation or most likely a change in instrument calibration at Jacobs. The analysis supports that the ALS analysis of the Submitted Portion is valid for Cu at all grades.

8.2.4 Blanks, Laboratory Duplicates and Standards

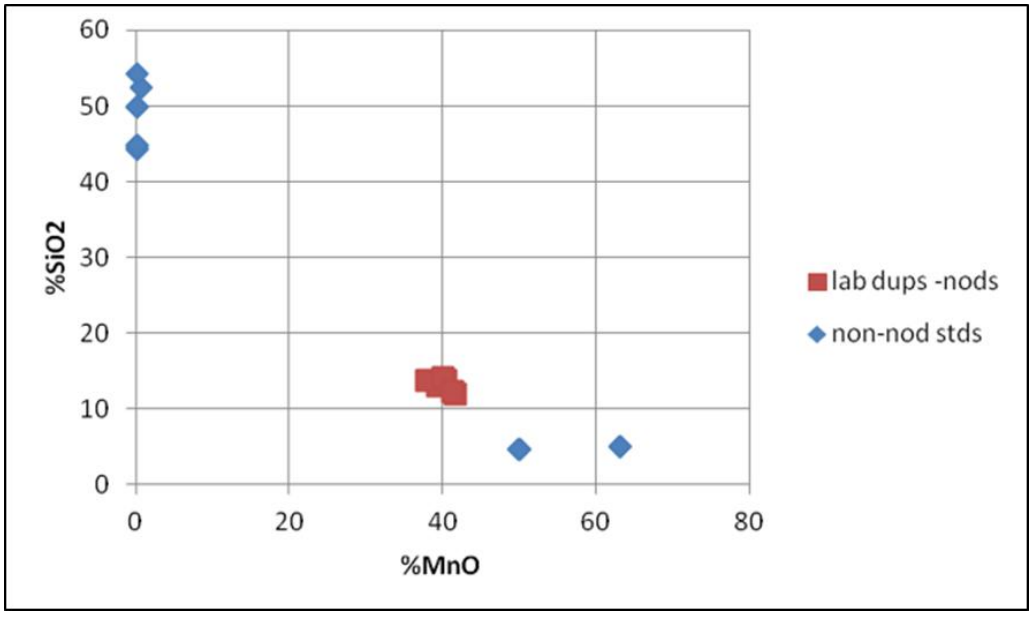
Numbers of blanks, laboratory duplicates and standards are presented below. Note that Jacobs refers to duplicates as replicates.

Table 8.3 Blanks Laboratory Duplicates and Standards

	ALS			Jacobs
	XRF	LOI	ICP	ICP
Box-core samples analysed[i]	131			–
Laboratory duplicates	6	9	8	4[iii]
Blanks	4		8	–
Non-nodule standards	12	9	8	–
Dredge samples analysed[ii]	–			–
Laboratory duplicates	11	9	–	2
Blanks	6		–	–
Non-nodule standards	17	9	–	–
Nodule standards	5	–	–	7[iv]

[I] Includes 25 submitted duplicates as well as a crust and a buried nodule analysed for research purposes
[ii] For the purposes of this note only samples collected during CCZ15 included here
[iii] Two duplicates being replicate digestion from the same pulp split and two being replicates from a separate pulp split
[iv] Jacobs analysed dredge and box-core samples as a single batch; ALS analysed the dredge samples approximately 7 days after the box-core samples

Figure 8.7 ALS Laboratory duplicates and non-nodule standards



All ALS blanks were below detection limit for the key elements of interest (reported in the mineral resource), i.e. Ni, Mn, Cu, Co. One batch of four blanks retuned Ga values of up to 28% of the mean for nodules but other elements were below or near detection limits.

Within the ALS box-core QAQC set, the range of non-nodule standards are compared with the laboratory duplicates in Figure 8.7 for the two most relevant elements Mn and Si. For these elements all of the analysed standards were within acceptable bounds.

Figure 8.8 ALS Laboratory duplicates compared to submitted portions

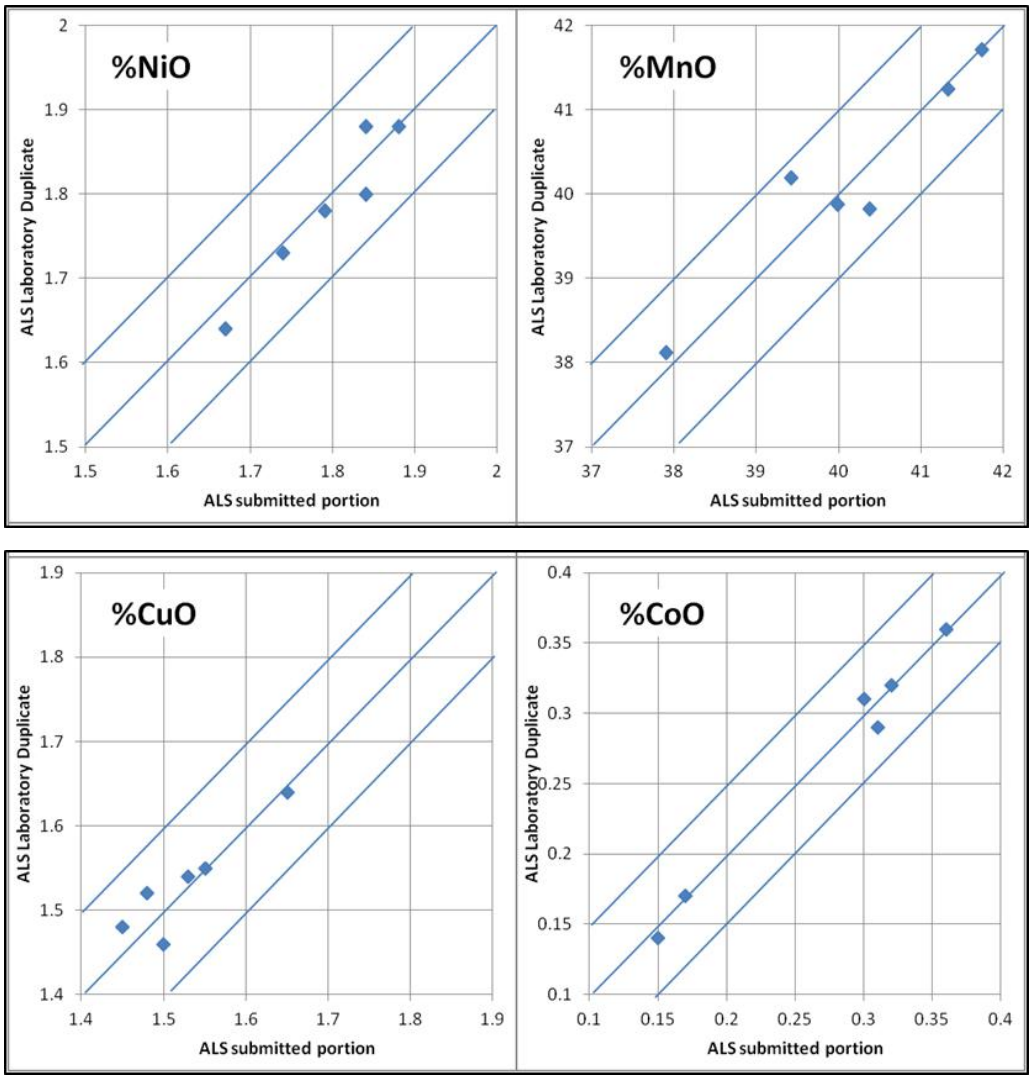
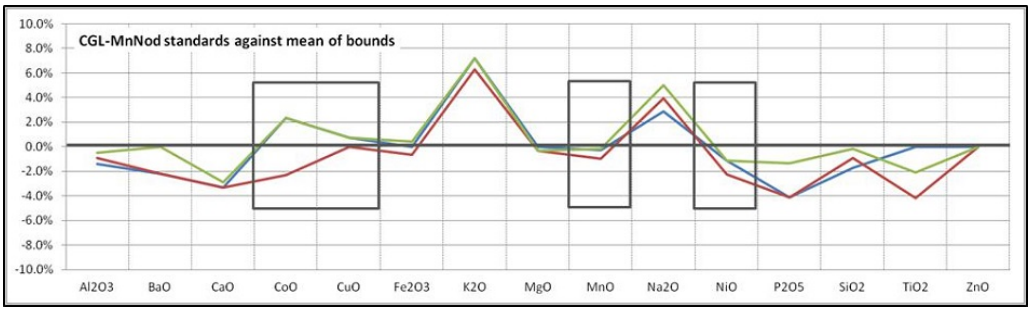


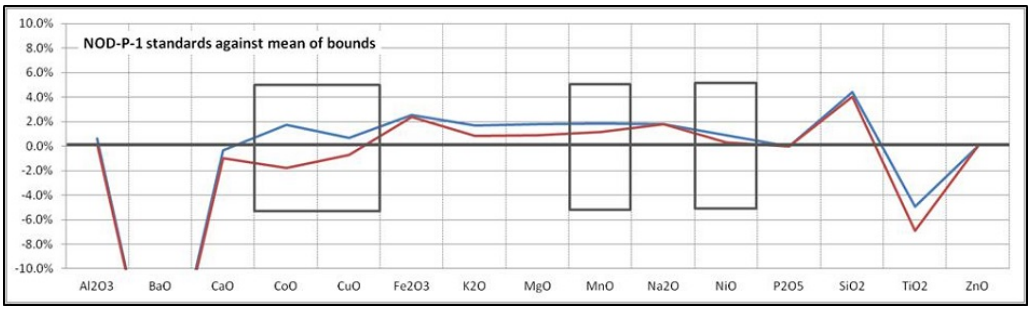
Figure 8.8 shows the close agreement between ALS laboratory duplicates (separate aliquot from pulverised material) and the original analyses of the Submitted Portions. Laboratory duplicates by Jacobs for Ni, Cu, Co and Mn are all within 3% relative agreement.

Figure 8.9 ALS performance against the CGL-131 nodule standard



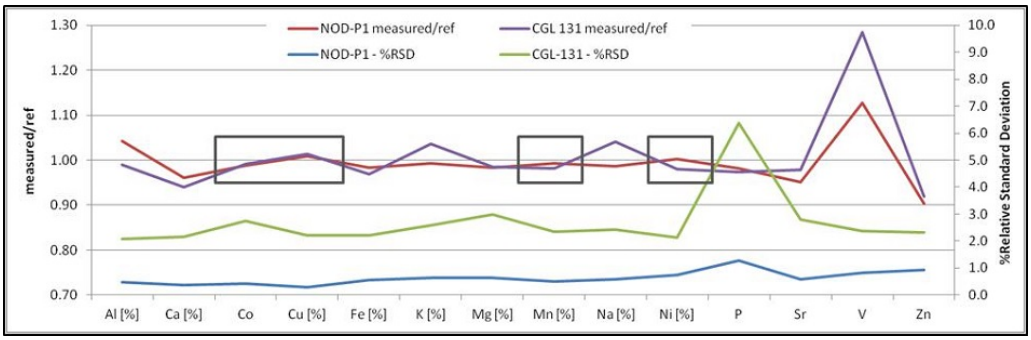
Grey boxes are ±5% relative for key elements of interest

Figure 8.10 ALS performance against the NOD-P1 standard



Grey boxes are ±5% relative for key elements of interest

Figure 8.11 Jacobs performance against the CGL-131 and NOD-P1 standards for Cu re-analysis work



Grey boxes are ±5% relative for key elements of interest – the special run of these standards are not included in Table 8.1

8.2.5 TOML photo abundance estimates Chain of Custody

Nodule abundance was estimated by TOML using two methods:

1. Physical samples using a box-corer (see COC above).

2. Long axis based estimates from photographs.

Photographs were taken during the CCZ15 campaign by contractor Yuzhmorgeologiya. The photos were transmitted from the towed camera sled in real time to a camera operator and were automatically named with the date and time (in UTC) of the survey. File posting location was on a secure server (airwalled) with access by camera operator, surveyor and geoscientists.

Location of the camera sled at the time of photography was recorded separately by the Yuzhmorgeologiya hydrographic surveyor on watch using a combination of vessel GPS and either USBL signal or estimate of position from length of line out. Survey periods are recorded in the bridge log, vessel log and daily progress reports.

Photos were logged in near real time for geology and biology, with periodic updates of photo files to the filing on the TOML master computer.

Abundance estimates were made only for select photos due to the intense nature of the work and issues with sediment cover in some areas. Normally in TOML Areas B1 and C1 every 100^{th} photo was selected. The selected photos were georeferenced to a template in a GIS program by a geoscientist and the long axis of each nodule within selected swaths was digitised. Each photo was checked by the Lead Geoscientist on watch and by the Lead Geoscientist designated accountable for data quality. The Chief Scientist ran a routine to measure the digitised lengths and also compiled the data into a MS Access database.

Copies of the processed data were passed, via email, to the Mineral Resource Qualified Person midway through the photo-profiling programme and after the campaign.

8.2.6 TOML adequacy of sample preparation security and analytical procedures

TOML had clear and secure chain of custody for the nodule samples collected during their exploration campaigns. Sufficient Field and Submitted Duplicates have been taken to demonstrate lack of significant error in the chemical analyses. TOML also followed rigorous procedures for abundance estimation using both physical samples and photographs, with good correlation and validation.

Data storage is secure and there is no evidence of any tampering of grade and abundance measurements.

Overall, the data are reliable for Mineral Resource estimation. This is supported by the very similar grades and abundances obtained in the historical sampling.

9 Data Verification

9.1 Historical data

Sampling data were collected by six Pioneer Contractors during the 1970s to 2000s. As part of the ISA requirements to relinquish half of the registered Pioneer Contractor's claims, the data for the relinquished portions were made available to the ISA where they were archived. This entire data set was first provided to TOML in a comma delimited format, and then independently to Golder Associates in 2012 who were then compiling a technical report on this same project (Golder Associates, 2013). Mineral Resources QP in this report was the lead QP for the Golder Associates technical report.

The database provided by the ISA contains multiple independent datasets that were independently collected and sampled using similar methods (FFG or BC sampling) but with slightly different equipment and were assayed by different laboratories. Because the database contains multiple datasets the datasets can be compared with each other for the purpose of validating the internal consistency of the data. Additionally, there are a number of published summaries of data that have not been provided to the ISA but show similar mean grades to the data within the TOML Exploration Area (Table 9.1).

Golder Associates contractor Charles Morgan was familiar with the procedures and processes that were used in collecting and assaying the samples. He was also involved with collection, inspection and analysis of samples, photographs and video coverage of the polymetallic nodule deposits for Lockheed Martin while on board the exploration ship MV Governor Ray. Dr Morgan was also involved with reviewing the Pioneer Contractors work and results, through his role on the ISA Legal and Technical Commission (ISA LTC), and in the compilation of ISA Technical Bulletin No. 6.

The sample data are supported by independent third party data, have been reviewed by the ISA LTC during the process of granting licences to the Pioneer Contractors, and are maintained by the independent ISA. Golder concluded that these data are suitable for Inferred Mineral Resource estimation purposes.

9.1.1 Data independence

QP Matthew Nimmo received the available data collected from within the CCZ and the TOML Exploration Area from the ISA via Charles Morgan. The data set was received on June 22 2012 from Dr Vijay Kodagali, Senior Scientific Officer of the International Seabed Authority (Email: vkodagali@isa.org.jm) who sent the data by email in Microsoft Excel format.

This data set is identical to the one used for the resource assessment provided by TOML, verifying the source of the sample data.

The database includes all data submitted to the ISA that were collected in the Reserved Areas of the CCZ. The data were collected by parties completely independent of TOML or Nautilus Minerals and retained exclusively in the custody of the ISA prior to their transfer. The data sets were also subject to third party review by the ISA's LTC, as part of the process of granting Pioneer Contractors Exploration Areas.

9.1.2 Historical data integrity

The original assay sheets from the laboratories for the individual nodule samples within the TOML Exploration Area are not available. Neither are the quality control procedures used by the laboratories and the ISA. It is reasonable to infer that the historical data is of sufficient quality for an Inferred Mineral Resource estimate because:

- The ISA is an independent agency with significant accountability under the Law of the Sea. Part of its mandate is the receipt and storage of sea floor sampling data suitable for the estimation of nodule resources and the legally binding award of licenses. It is reasonable to assume that a reasonable level of care was applied by the ISA.

- Comparison of the six independent data sets from the CCZ shows a high level of consistency in abundance and grade and, conversely, provides no evidence of bias or systematic error in the TOML data.

- Recent TOML nodule sampling confirms the existence, and abundance and grade continuity of the polymetallic nodules within the TOML Exploration Areas.

9.1.3 Data comparisons for the entire reserved areas

The Quality Assurance/Quality Control (QAQC) data for the historical samples are not available. Some QAQC is known to have been completed at the time, but there was no requirement to submit the results to the ISA. All the Pioneer Contractors collected samples by slightly different methods and assayed using different laboratories from what is effectively a single deposit. Due to the vast size and relative consistency of grade of the deposit the comparison between the data sets can be used as a proxy for QAQC.

Data covering the reserved blocks of ISA contained only a small number of anomalous values that may be suspected to be erroneous (four out of 2212 data points). These included:

- A Co value of 3.23% (next largest is 0.56% Co).

- Two Cu values of 157.0% and 66.0% (probably 1.57% and 0.66% respectively) (next largest is 1.62% Cu).

- A Mn value of 288.0% (probably 28.8%) (next largest is 35.62% Mn).

All these anomalous values are likely data entry errors and are contained within one contractor dataset (Yuzhmorgeologiya) and do not occur within the TOML Exploration Area, these data points were not used in any way for the resource estimate.

The box plots and log-probability plots (Section 11) comparing the data sets show that the distributions for Ni, Co, Cu, Mn and abundance are very similar between the different data sets, and across the CCZ. Variations between the data sets are attributed to both spatial variability and minor differences in sampling and assaying methods.

Figures comparing the assay distributions of the samples within the TOML Exploration Area with all other available data from the reserved blocks are presented in Section 7. These plots show that Ni, Cu and Mn compare well but with divergence at the tails of the distributions, while Co and nodule abundance tend to be biased slightly lower for the TOML data.

The samples within the TOML Exploration Area used for the Mineral Resource estimate were collected by Yuzhmorgeologiya, DORD and Ifremer. These three data sets show no significant differences.

Overall the results confirm the consistency of the mineralisation across the entire CCZ and the TOML Exploration Area which form a small part of the CCZ.

9.1.4 Comparison with non-ISA sourced data

Table 9.1 lists the mean grades of the nodules from different parts of the CCZ that were based on data that is not included in the data obtained from the ISA. These mean grades are very consistent with each other and with the mean grades of the data that falls within the TOML Exploration Area.

One example is from the Scripps Institution of Oceanography (SIO) which compiled a database of polymetallic nodules information from numerous sources (referenced in the database), last updated in 1981 (NOAA, 2013 a). As a comparison exercise, this dataset was clipped to the CCZ and analysed for comparison with the available ISA database. Note that as the vast majority of these samples were collected by dredging and coring, abundances were not estimated or recorded, and therefore only grade analysis is possible. The dataset was downloaded and imported into Microsoft Access, with some minor format alteration in the process. This database was then saved and accessed directly from ArcGIS.

A polygon representing the boundaries of the CCZ was used to query the database, and create a subset containing only samples within this zone. The mean values are included in Table 9.1.

Table 9.1 Mean Grades of the CCZ Nodules from Various Sources

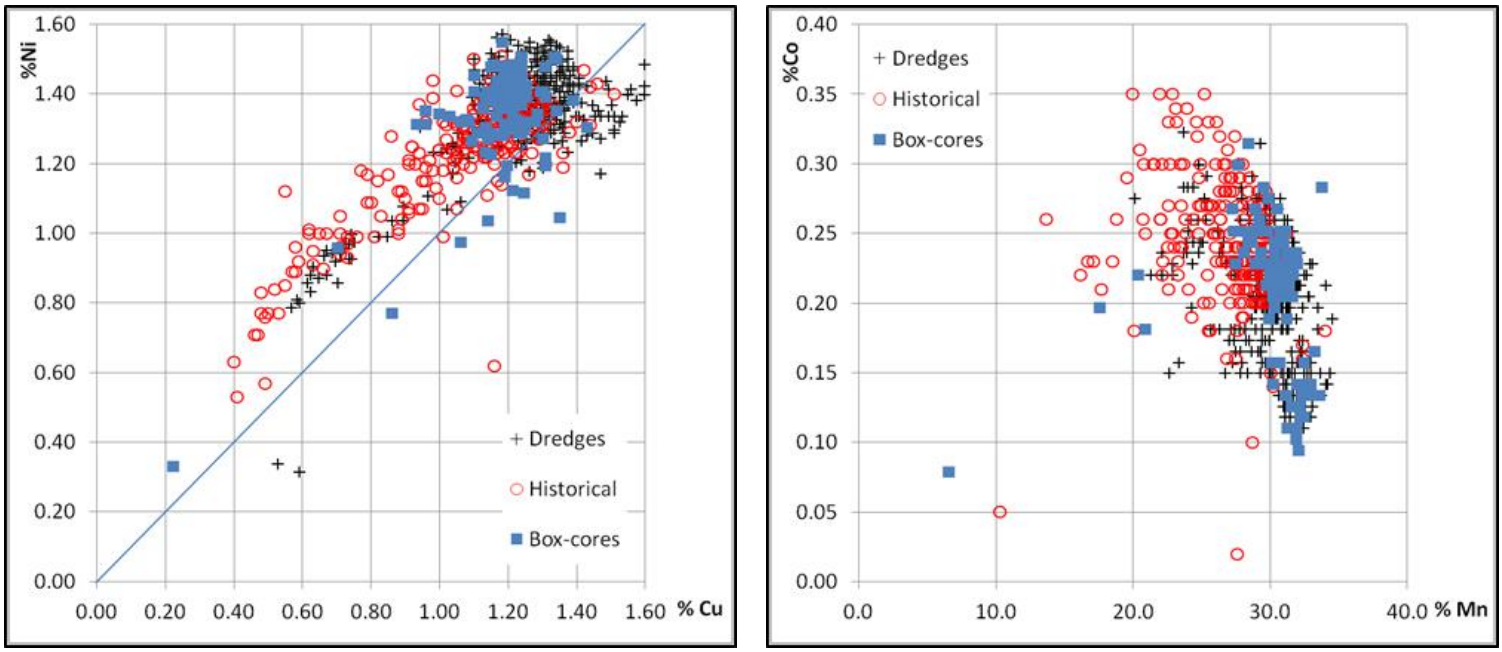
Ni (%)	Cu (%)	Co (%)	Mn (%)	Abundance (wet kg/m2)	Number of Samples	Source
1.24	1.03	0.22	27.2	6.5	2196	Data supplied by ISA (All CCZ)
1.22	1.06	0.24	26.9	8.5	255	Data supplied by ISA (TOML Exploration Area)
1.20	0.98	0.20	26.3	–	–	McKelvey et al, 1983
1.22	0.97	0.16	24.5	–	160	SIO (NOAA, 2013a)
1.29	1.19	0.23	29.1	–	–	Friedrich et al, 1983
1.28	1.16	0.23	24.6	–	–	Mielke (1975)
1.3	1.0	0.23	24.6	17	141	Ruhlemann et al (2011) west area
1.3	1.1	0.17	24.6	10	237	Ruhlemann et al (2011) east area

9.2 TOML data

9.2.1 Comparison of historical and TOML data

The CCZ13 and CCZ15 sample results of TOML were compared with historical samples. There is good correspondence given that the areas sampled are different. High Cu and Mn grades are less common in the historical samples but the ranges are the same and QA/QC for these elements show no issue with the TOML analyses of these elements.

Figure 9.1 Comparison between TOML analyses and historical analyses



The TOML analyses are from the submitted portion; the same plots by area are included in Section 6

9.2.2 Nodule variation test work

Grade variation between nodule box-core samples is very low, with coefficients of variation typically around of 0.05 to 0.2 compared to nodule abundance which is typically around 0.5 to 0.7 (Table 9.2). Even extensive sub-sampling (dredge “variance” samples) did not expose any significant variance in grades (CV <=0.06).

Table 9.2 Coefficients of variation for historical and TOML nodule samples

Number of samples		Area/sample type	Coefficient of variation				
Primary	Sub	Nodules	Mn	Ni	Cu	Co	Abundance
2	60	Area A TOML Dredge “variance”	0.09	0.18	0.34	0.22	n/a
18	0	Area A Historical	0.10	0.21	0.35	0.18	0.50
27	0	Area B1 TOML BC	0.20	0.21	0.21	0.18	0.90
1	20	Area B1 TOML Dredge “variance”	0.02	0.03	0.04	0.09	n/a
89	0	Area B Historical	0.17	0.20	0.27	0.22	0.67
14	0	Area C1 TOML BC	0.02	0.03	0.03	0.07	0.73
1	30	Area C1 TOML Dredge “variance”	0.03	0.03	0.04	0.11	n/a
87	0	Area C Historical	0.08	0.08	0.13	0.13	0.44
38	0	Area D1 and D2 TOML BC	0.03	0.07	0.05	0.09	0.61
10	187	Area D TOML Dredge “variance”	0.06	0.10	0.10	0.12	n/a
42	0	Area D Historical	0.05	0.06	0.08	0.10	0.53
12	0	Area E Historical	0.10	0.15	0.17	0.18	0.56
25	0	Area F and F1 TOML BC	0.03	0.06	0.06	0.13	0.23
4	82	Area F TOML Dredge “variance”	0.03	0.05	0.08	0.10	n/a
2	0	Area F Historical	0.00	0.03	0.01	0.04	0.27

The dredge “variance” samples were groups of up to 30 sub-samples collected from each dredge in order to study the grade variance or nugget of a sample point. As the dredges were often landed several times in a deployment a much larger range was covered than would be expected in a single box-core.

Figure 9.2 compares the CVs of the historical data and TOML dredge and box-core samples. The size of the circle is proportional to the CV (or spread) of the grades of the samples.

9.2.3 Nodule long-axis estimate validation

Photographs were used by commercial explorers in the 1970s to estimate polymetallic nodule abundance (Felix, 1980; Kaufman and Siapno, 1972).

The benefits of photos over physical sampling were immediately recognised, i.e.:

- Quicker and cheaper
- Larger primary sample (area)

This relationship works through measurement of each nodule’s long (or major) axis and the outcome is much better than estimates from photo-based nodule coverage or acoustic response. The process of estimating the weight of nodules was called Long-Axis Estimation (LAE).

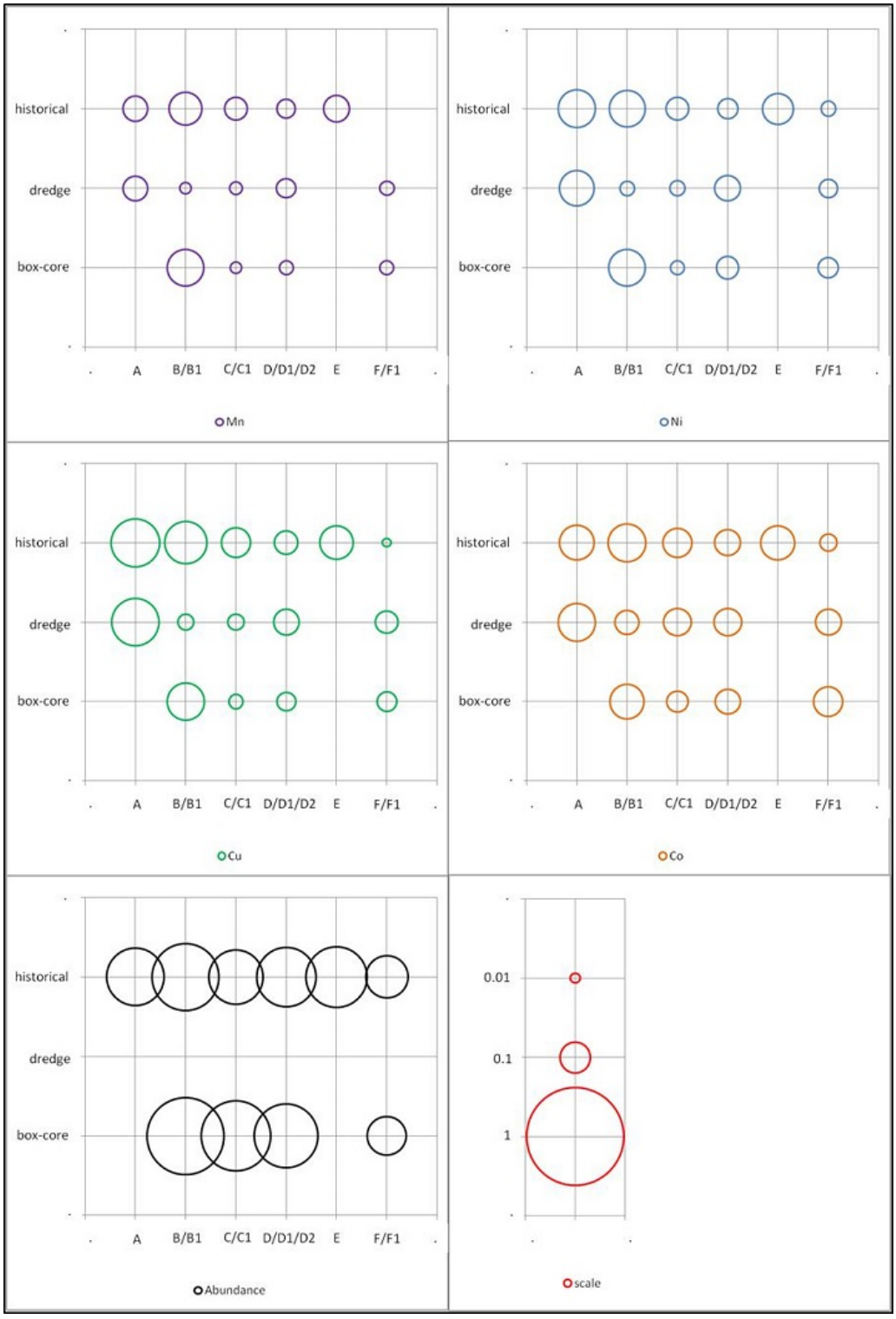
As discussed below, a key limitation of photo-based abundance estimation was that in some areas sediment ‘powder’ or ‘cover’ was sufficient to mask too many of the nodules to allow an accurate estimate. A correction factor might be possible in some of these cases, but this has not been applied to date on the TOML areas as it is likely crude and development requires more work.

Felix (1980) proposed a formula for nodules within part of the Kennecott area as follows:

$$\text{Log}_{10}\text{wt.} = (2.71)(\log_{10}\text{LA_cm}) - 0.18$$

Where wt. is the wet mass of the nodule in grams and LA_cm is the long or major axis of that nodule in centimetres. This formula was modified slightly in both TOML Areas B1 and C1 based on calibration results.

Figure 9.2 Comparison of coefficients of variation for historical and TOML nodule samples



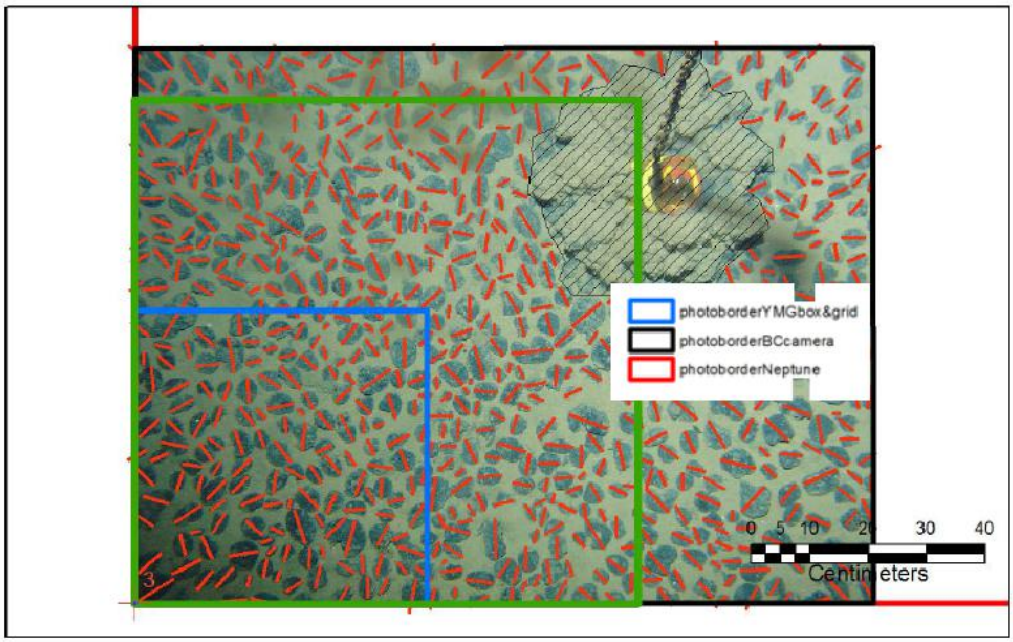
Values from Table 9.2

9.2.3.1 Photo-based estimates in the TOML Area

During 2015 TOML collected seabed photos using a box core mounted camera system to collect seabed photos from areas B, C, D and F (bottom shots) and a towed camera system (called the Neptune) to collect seabed photos from areas B, C and D.

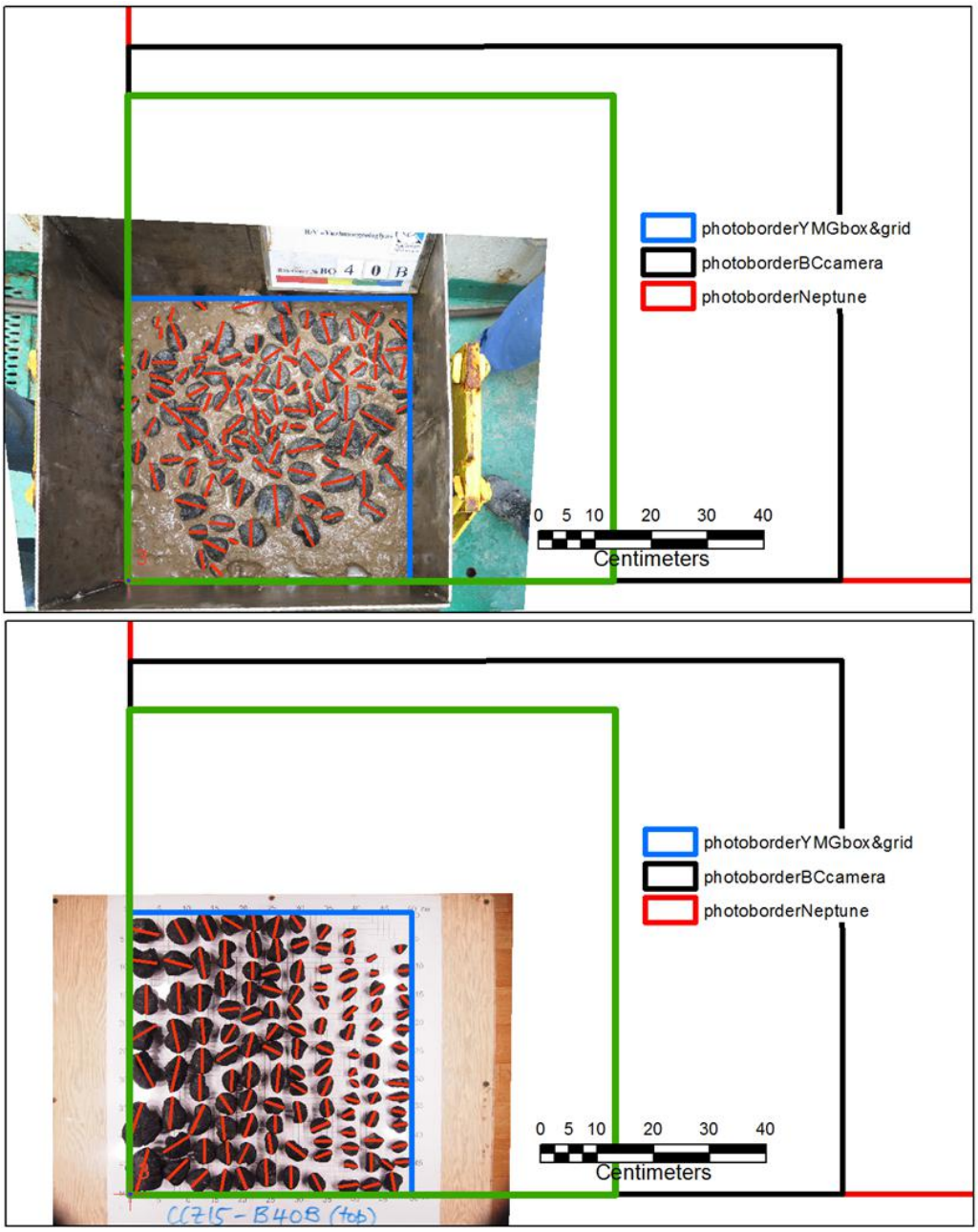
In areas B and C, it proved possible to use the bottom shots (e.g., Figure 9.3) as well as photos of the box-core samples taken on the vessel to calibrate and modify the Felix (1980) formula (above) to accurately estimate the weighed abundance of each box-core. The photos taken on the vessel included topshots of the sample in the box-core as it landed on deck and grid photos of the nodules from the box-core after washing off mud (e.g., Figure 9.4).

Figure 9.3 Example LAE measurement – bottom photo



Green frame is the area sampled by the KC box-corer

Figure 9.4 Example LAE measurement – top shot (YMG box) and grid photo

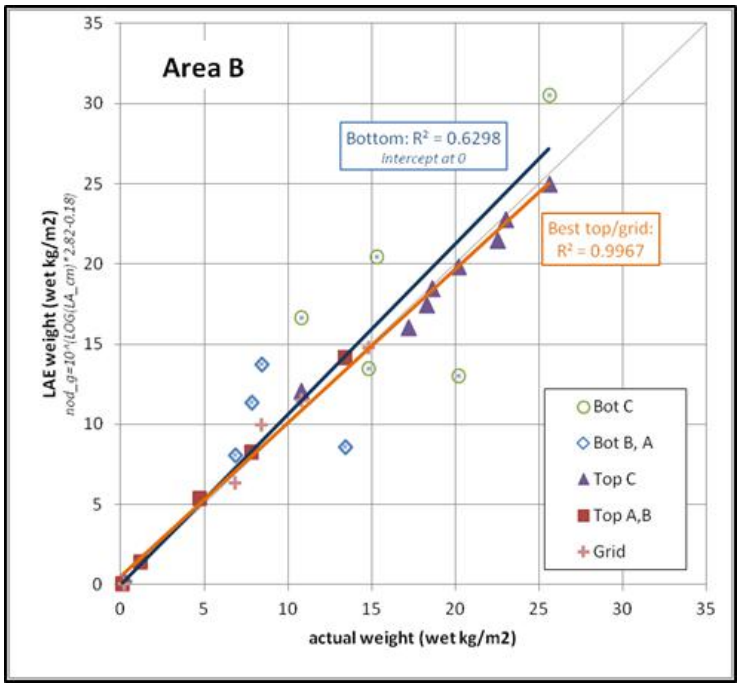


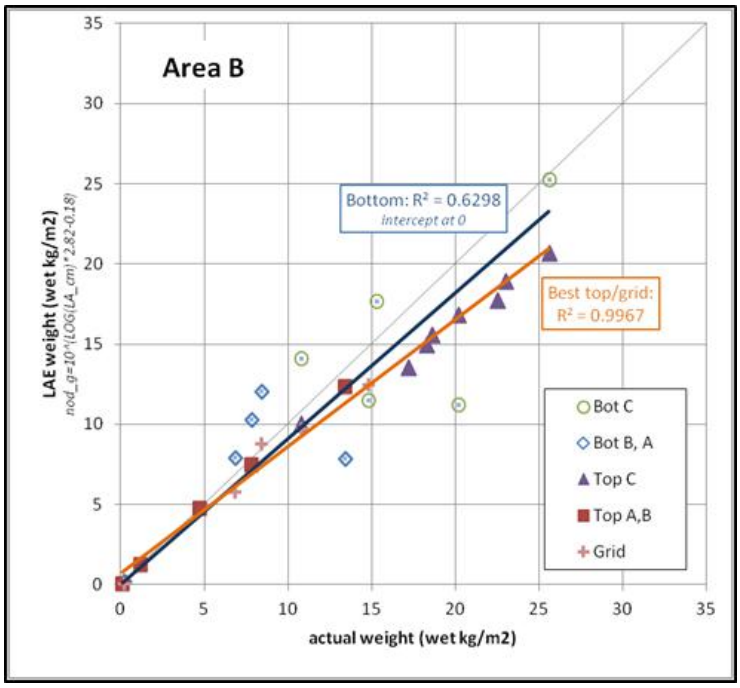
Green frame is the area sampled by the KC box-corer

The process involved referencing the photos to scale in a GIS package, using an average field of view based on a variety of images of the trigger weight-scale. Then a line was digitised along the long axis of each nodule before recording the length of each line into a database. The line measurements were then analysed in MS Excel, comparing the total calculated weight with the total actual sample weight. Accurate weighing of individual nodules was not possible due to the heave of the vessel, but a motion compensated scale could accurately weigh entire box-core samples (±50 g).

Initially the formula of Felix (1980) was used but a much better fit was achieved if the factors were modified (Figure 9.5). The need to modify the factors probably relates to difference in nodule's thickness:area aspect ratios between areas, that in turn could relate to differences in the thickness of the geochemically active layer.

Figure 9.5 Area B correlations with best fit factors (L) and Felix 1980 factors (R)





In Area B, long-axis estimates made use of box-core seafloor photos, topshots and, where needed, sample grid photos, as in some cases the camera on the box-corer didn't work, and in other cases the sample arrived on deck scrambled into the sediment. Area B was compared by type of nodule (Contractor Yuzhmorgeologiya facies A, B, C) as well as combined types with no noticeable difference in relationship.

The calibrated relationship stood up very well (Figure 9.5); better than some nodule by nodule point counting that was also tried and so the formula was applied to the Neptune photos (approximately every 100th) with results broadly agreeing with the box coring (Figure 9.6) but providing much more detail.

The processing involving the Neptune towed camera sled photos was broadly similar to the calibration work done with the box-core bottom photos except that the Neptune images were referenced to an average field of view from images that clearly showed two centrally located laser pointers (30 cm spacing) carried on the towed camera sled. Although an electronic altimeter triggered the camera at near identical heights above the seafloor, each image varied slightly in terms of field of view due to flare and rocking of the sled in response to vessel motion.

Due to the very large volume of readings (>90,000) the digitised nodule lengths were compiled into and reported from a MS Access database. They were also studied using the statistical program R.

The process was then extended to Area C, and with agreement of the mineral resource Qualified Person only half the box-cores were taken (for calibration and grade estimation) as the Neptune photos were seen to be the better dataset due to area covered in each shot and frequency of photos available for measurement-interpretation. Again, the factors in the Felix (1980) formula were adjusted to improve accuracy (Figure 9.7).

In Area C the correlations between bottom photos based estimates and actual weights show less scatter – this might be due to a slightly different camera with a wider field of view being used.

Figure 9.6 Comparison of physical samples and LAE in Areas B and C

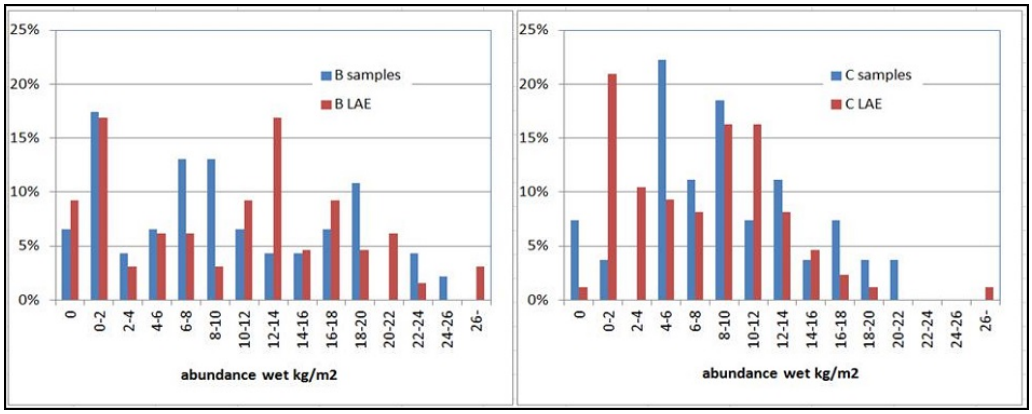
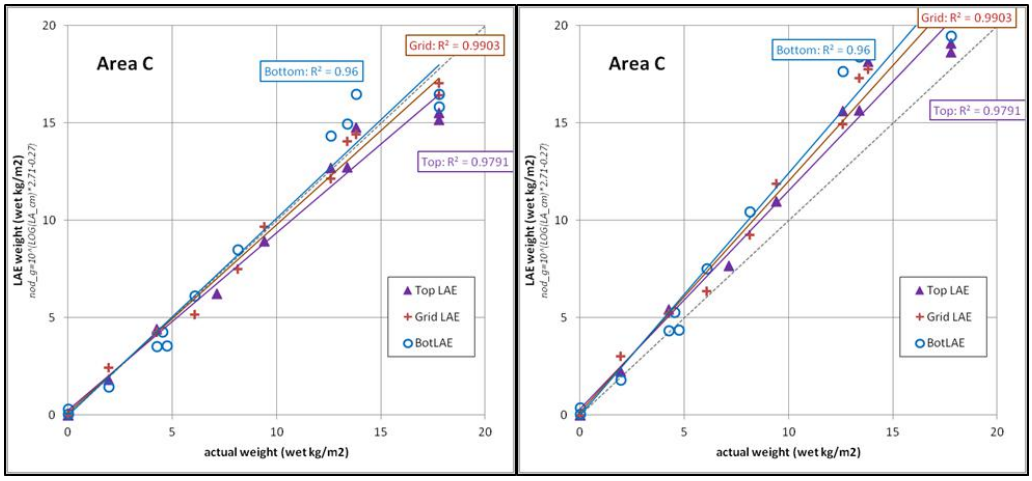
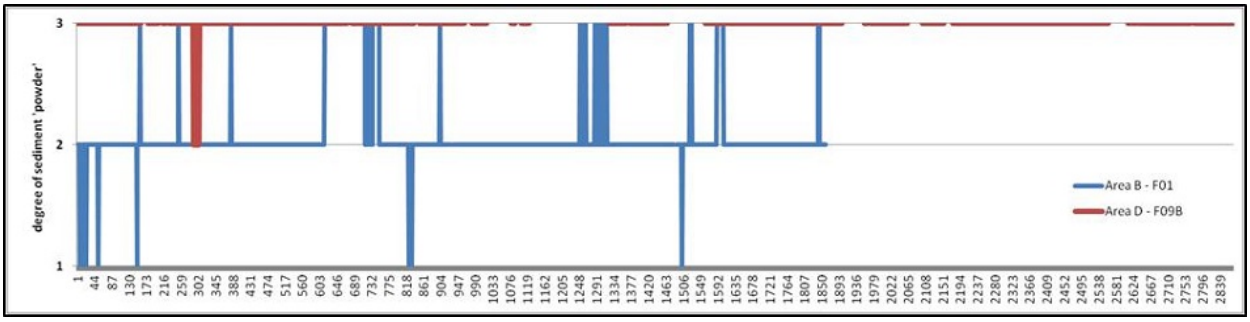


Figure 9.7 Area C correlations with best fit factors (L) and Felix 1980 factors (R)



In Area D however, the degree of cover (Figure 9.8, Figure 9.9, Figure 9.10) confounded the process. This possibility of this had been warned by Felix (1980), so after the orientation Neptune lines were complete, the survey focused on box-cores and there is no Neptune LAE data from this area for mineral resource estimation purposes.

Figure 9.8 Degree of powder on visible nodules in Area D vs Area B



Note that level 3 cover is the highest possible per the logging schema used during the CCZ15 campaign.

Figure 9.9 High degree of sediment “powder” and cover in Area D

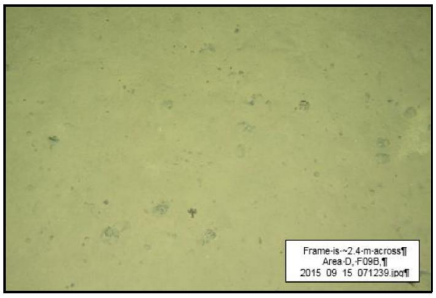


Figure 9.10 Covered nodules B75, Area D2



In Area F, no towed camera survey was done but a visual comparison between bottom photos, topshots and grid photos reveals good exposure of nodules.

Abundance variance for both box-core samples and LAE estimates are summarised and compared in Table 9.3. Area B1 and Area C1 have higher box-core based global coefficients of variation than Area D1 and Area D2, while Area F and Area F2 are especially continuous. Thus, the Neptune LAE results are helping in the two more variable areas and would probably have been less critical in the others.

Table 9.3 Summary statistics of abundance between box-cores and LAE

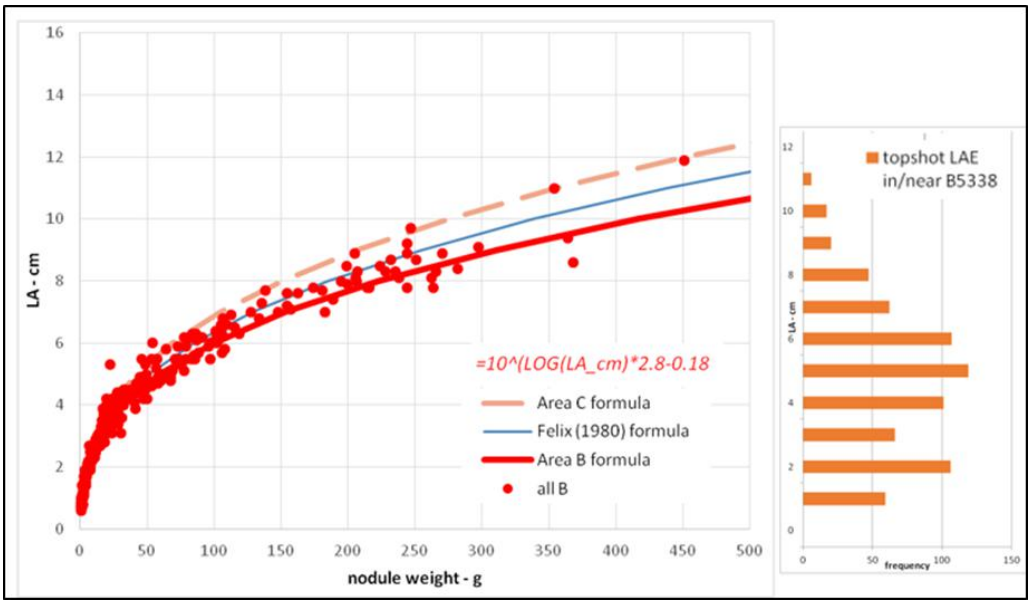
Area	Type	Count	Stdev	Average	CV
B1	BC	30	8.25	9.35	0.88
B1	NeptLAE	75	7.74	10.16	0.76
C1	BC	16	5.54	7.80	0.71
C1	NeptLAE	86	5.40	7.34	0.74
D2	BC	26	6.86	11.59	0.59
D1	BC	16	8.20	13.84	0.59
F	BC	15	6.81	15.80	0.43
F1	BC	10	4.63	21.65	0.21
Historical data used in 2012 NI43-101 Inferred estimate (count = 255)					0.62

9.2.3.2 Confirmation Study

In April 2016 individual nodules were weighed on shore to check the relationships obtained and applied at sea. More accurate weighing of individual nodules was possible, now that the work could be done on land without the influence of vessel heave, but the samples used were necessarily residues of the collected samples that had already been split and sub-sampled for grade, reference and mineragraphy. Also, the samples had been transported several times and were then more 6 months old and so were often comprised mostly of broken nodules which could not be measured. Nevertheless, some 390 nodules were each weighed and measured with results as follows:

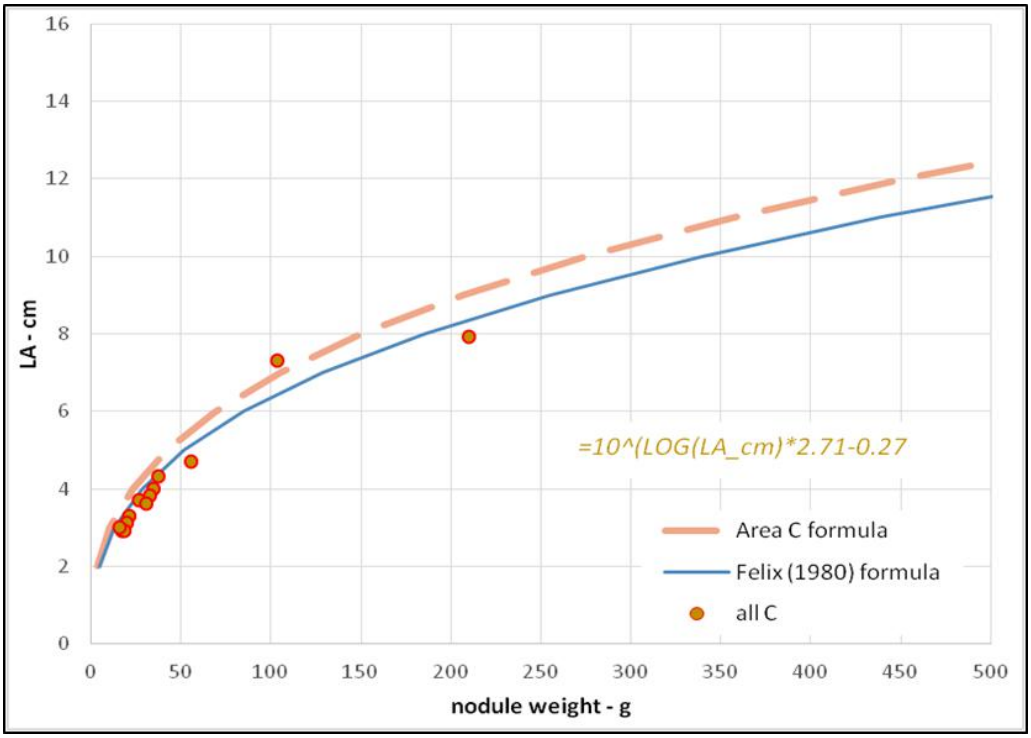
In TOML Area B1 there was a good fit between the formula used at sea and individual nodules weighed (Figure 9.11) confirming a valid relationship. While a slightly better visual fit might have been possible regarding the larger nodules it is likely that the unbiased correlation in Figure 9.7 would be adversely impacted (e.g., using Felix's factors in Figure 9.5). Large nodules are uncommon and it is not clear how representative the individuals weighed actually are (irregular nodules might be more prone to breakage).

Figure 9.11 Confirmation nodules weights Area B and histogram of nodules by long-axis length



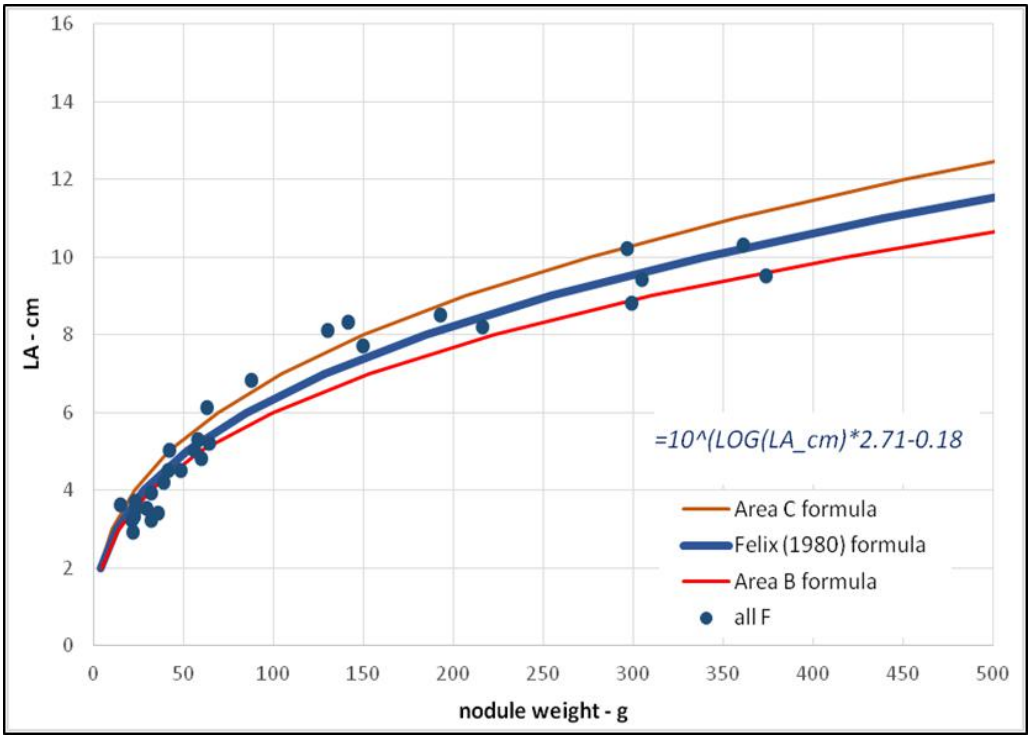
For Area C there was a shortage of whole nodules especially larger ones (which are naturally rare in Area C; Figure 9.12) but the relationship and formula was confirmed. There is a chance that the formula is a little conservative (i.e., factors a little closer to Felix's or Area B's could have been used), but again care needs to be taken considering the strong correlation obtained using the best fit factors versus the imparted bias using Felix's factors in Figure 9.7.

Figure 9.12 Confirmation nodules weights Area C



For TOML Area F, if LAE is used in the future, then the factors published by Felix look to be potentially suitable (Figure 9.13). It is worth noting that TOML Area F is near the southern side of the Kennecott “Frigate Bird” exploration area, and that the larger nodules there are known to be distinctly thinner in aspect (Section 6).

Figure 9.13 Confirmation nodules weights Area F



9.3 Adequacy of data

The historical nodule sample data is considered suitable for the purpose of estimating Mineral Resources to an Inferred level of confidence. The QP also considers that the combination of the TOML and historical nodule sample data (physical samples and photo based long axis estimates) combined with detailed backscatter, photo profiling and geological interpretation is sufficient to estimate polymetallic nodule Indicated Mineral Resources and, in one small especially data rich area, Measured Mineral Resources.

The primary characteristic of the polymetallic nodule deposit that separates this deposit from typical terrestrial manganese, nickel and copper deposits is that the nodules themselves can be accurately mapped through photo-profiles and backscatter acoustic response. The bulk of the polymetallic nodules sit on top of the seabed allowing them to be photographed. However, in some areas such as TOML Area D some nodules are partially covered by sediment making it more difficult to detect the presence and abundance of the nodules. The most accurate method for determining nodule abundance is through physical sampling by box-core or free fall-grab sampling. However, these methods are costly and result in wide sample spacing. Due to the fact that nodules are visible, photography can be used in many areas to estimate nodule abundance directly. The two methods for doing this are estimating the nodule percent coverage (percent of exposed nodule surface area within the photo) and measuring each individual nodule long-axis and then using these measurements to calculate abundance using variants of the formula defined by Felix (1980). The long-axis estimation (LAE) method is the most accurate and preferred method but comes at a cost in the time to manually process each photo - limiting the number of photos that can be used for estimating abundance. The benefit of using photographs is being able to demonstrate continuity between physical sample location and accurately quantify nodule abundance. TOML is developing an automated method of doing these measurements for future application.

The QP considers the abundance estimates derived from photographs to date from TOML Areas B and C, to be suitable for estimating nodule abundance for the Mineral Resource.

10 Mineral Processing and Metallurgical Testing

Considerable mineral evaluation and metallurgical testwork on nodules from the CCZ has been reported. This was predominantly at a laboratory scale, with some test work at a pilot plant scale (Sen, 2010). All published historical work indicates that processing of nodules is technically feasible. To maximise recoveries of valuable metals the manganese lattice has to be broken down, either through pyrometallurgical or hydrometallurgical/biohydrometallurgical action.

Haynes et al (1985), in a NOAA funded US Bureau of Mines managed study, examined in detail the chemistry, morphology, and mineralogy of the nodules as well as five discrete processing routes. The processing routes are either hydrometallurgical or combinations of pyrometallurgical and hydrometallurgical processes, and were investigated at the bench scale with nodule feed, with a specific focus on tailing and slag composition (Haynes et al, 1985). The potential process routes (Figure 10.1) include:

- Gas reduction and ammoniacal leach process (Caron process).
- Cuprion ammoniacal leach process (as developed by Kennecott in their nodule studies in 1970s and 80s).
- High temperature and high pressure sulfuric acid leach process (HPAL).
- Reduction and hydrochloric acid leach process.
- Smelting and sulfuric acid leach process.

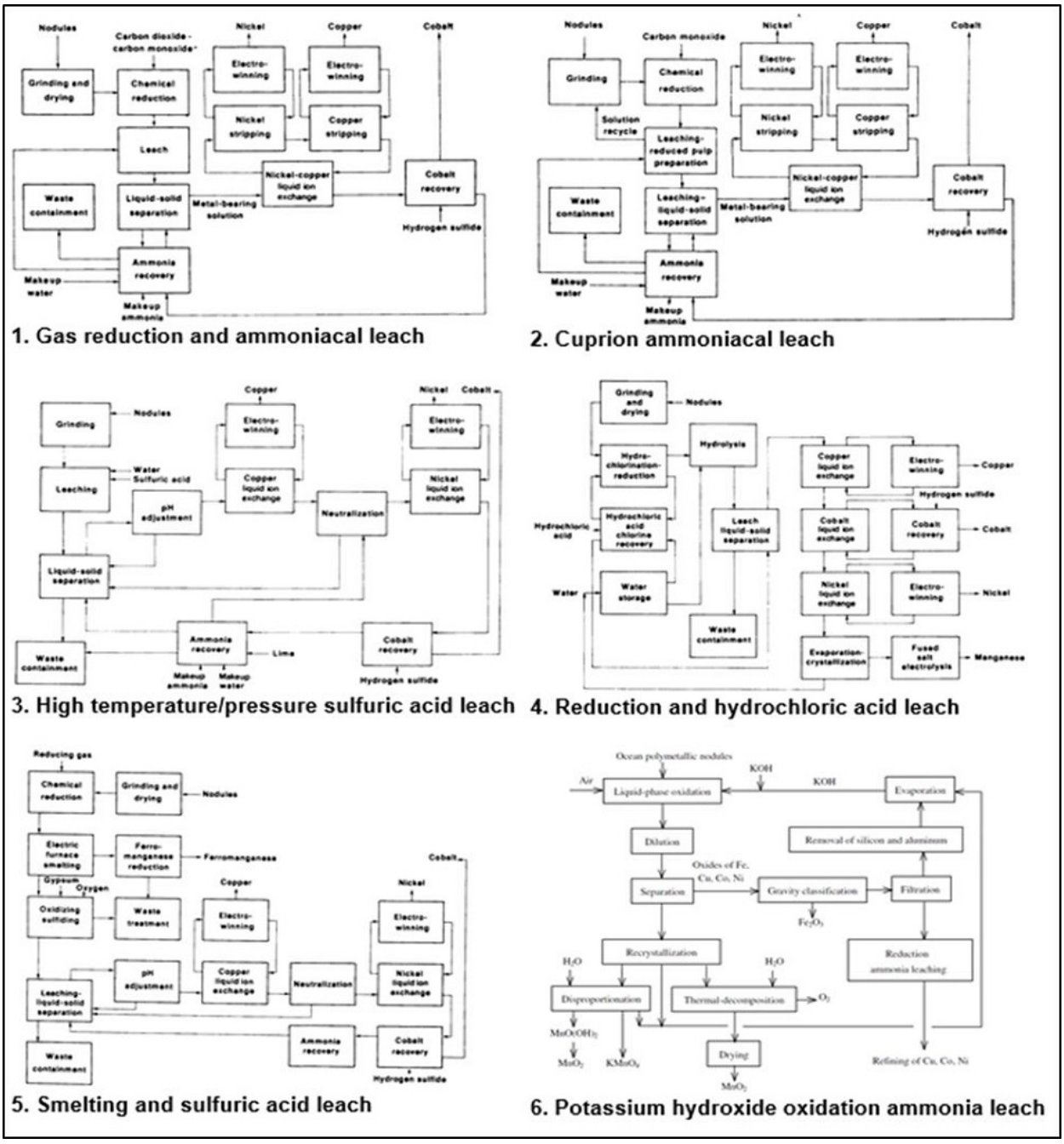
The first three processes are three-metal recovery systems with manganese reporting to a waste stream, with the last two also recovering manganese. The cuprion process operates at atmospheric pressure and temperature and flotation of the tailings can produce commercial grade manganese concentrates (NIOT, 2008).

Additional process routes, including biohydrometallurgy and alternative reducing agents, have been studied, e.g., Wang and Li (2005, Figure 10.1) and general reviews by Mukherjee et al. (2004) and Sen (2010).

Haynes et al (1985) and Wang and Li (2005) both conclude that the studied flow sheets for nodules are technically feasible. At the laboratory (bench top) scale Ni, Cu and Co recoveries vary but for the processes not using ammonia leach generally exceeded 90%. For the ammonia leach type processes recoveries vary with Haynes et al (1985) achieving greater than 90% for Ni and less for Co and Cu and Wang et al. (2005) achieving 95% for Cu, 65% for Co and 84% for Ni.

Neither Haynes et al (1985) nor Wang and Li (2005) reported Mn recovery, although the smelting process produced Mn rich tailings and a ferro-manganese product, and the hydrochloric acid leach process could also produce manganese. Sen (2010) reports process options with manganese recoveries of 85%. In NIOT (2008) COMRA reports that pilot tests on ‘smelting —oxidative leaching-SX’ returned metal recoveries of Ni, Cu and Fe of greater than 90%, Co of 89%, and Mn of 82%, while IOM, who studied both hydrometallurgical and pyrometallurgical process routes, report extraction efficiencies via sulphur-dioxide leaching of greater than 98% for Ni and Mn and greater than 90% for Co.

Figure 10.1 Potential process flow-sheets for seafloor nodules. 1-5 studied by Haynes et al. (1985) and 6 by Wang and Li (2005)



Recovery methods that could be employed for commercial development of polymetallic nodule deposits in the CCZ were studied in an IA for NORI Area D (AMC, 2021). The commonality between the polymetallic nodule deposits in NORI Area D and TOML Areas indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. This is discussed further in Section 11.9.

11 Mineral Resources

Estimation of tonnage and grade for TOML Exploration Areas A, B, C, D, E, and F within the CCZ was undertaken in the second quarter of 2016. The estimates are based on the historical box-core and free fall-grab nodule sampling (262 samples) supplemented with recently acquired TOML nodule box core (113 samples) and photo-profile data (20,857 frames over 587 line km). Only sample data within the TOML tenement Area was used to inform the estimates.

The Mineral Resource estimate reported here follows and supersedes a maiden NI 43-101 Inferred Mineral Resource estimates reported by Golder Associates (2013). Differences between the two estimates are consistent and explicable.

The modelling methodology used for estimating the Mineral Resource was determined through careful consideration of the scale of deposit, geological mechanism and controls behind nodule formation and nature of the sampling method. The approach involved estimating nodule abundance and grades into a two-dimensional block model. Abundance, in wet kg/m^2, was used for calculating tonnage. Abundance and grades were estimated using ordinary kriging (OK). Inverse distance weighting (IDW) and nearest neighbour (NN) estimates were used to validate the OK estimates.

The QP has assessed the available geological, mining and processing information regarding the manganese nodules and concluded that there are reasonable prospects of economic extraction (see additional explanation in Sections 10, 13, and 16).

11.1 Mineral Resource domains

The occurrence of polymetallic nodules within the CCZ is influenced on a regional scale by two large scale geological features: the boundary of the CCZ deposit and the presence of seamounts.

The boundary limits of the CCZ defining the region where nodules have been found to occur is bracketed by the Clarion and Clipperton Fracture Zones to the north and south respectively. The deposit extends to the west and east between the two fracture zones. The limits to the CCZ occur well outside the boundaries of the TOML Exploration Areas. Accordingly, 100% of the TOML Exploration Area fall within the CCZ polymetallic nodule deposit.

Bathymetric features only play a role in distribution of polymetallic nodules at a regional scale. There are principally two regional scale bathymetric domains: sea mount ranges and abyssal hill province. Based on interpretation of the GEBCO bathymetry data from the ISA, and TOML's own bathymetry, less than 2% of the TOML Exploration Area is covered by isolated sea mounts. Effectively, the entire TOML Exploration Area falls within the abyssal hill domain.

Within the TOML Area there are small, disconnected zones where there are no polymetallic nodules present or the polymetallic nodule abundance is very low. These zones are controlled by local geology (presence of basalt or carbonate ooze) and bathymetry.

The TOML Area has been split into two domains. Areas with polymetallic nodules and areas predominately without polymetallic nodules. The MBES bathymetry and the backscatter data was used to interpret the parts of TOML Area B through F with no polymetallic nodules. For the Mineral Resource estimate two broad domains have been interpreted from the data. These are:

1. NOD – polymetallic nodule domain. This domain exists almost everywhere and extends beyond the boundaries of the TOML Exploration Areas.

2. NON – areas with no or low nodule abundance of polymetallic nodules. This domain includes the No Nodules on Ooze (Nnoo), seamounts and areas with basalt. Nodule abundance in the NON areas was set to zero in the block model. It is not defined in Area A as that area has not been surveyed by MBES.

Figure 11.1 through to Figure 11.5 show the TOML Exploration geological domains used for the Mineral Resource estimate. Sample locations are indicated by white circles.

Figure 11.1 TOML Exploration Area A geological domains

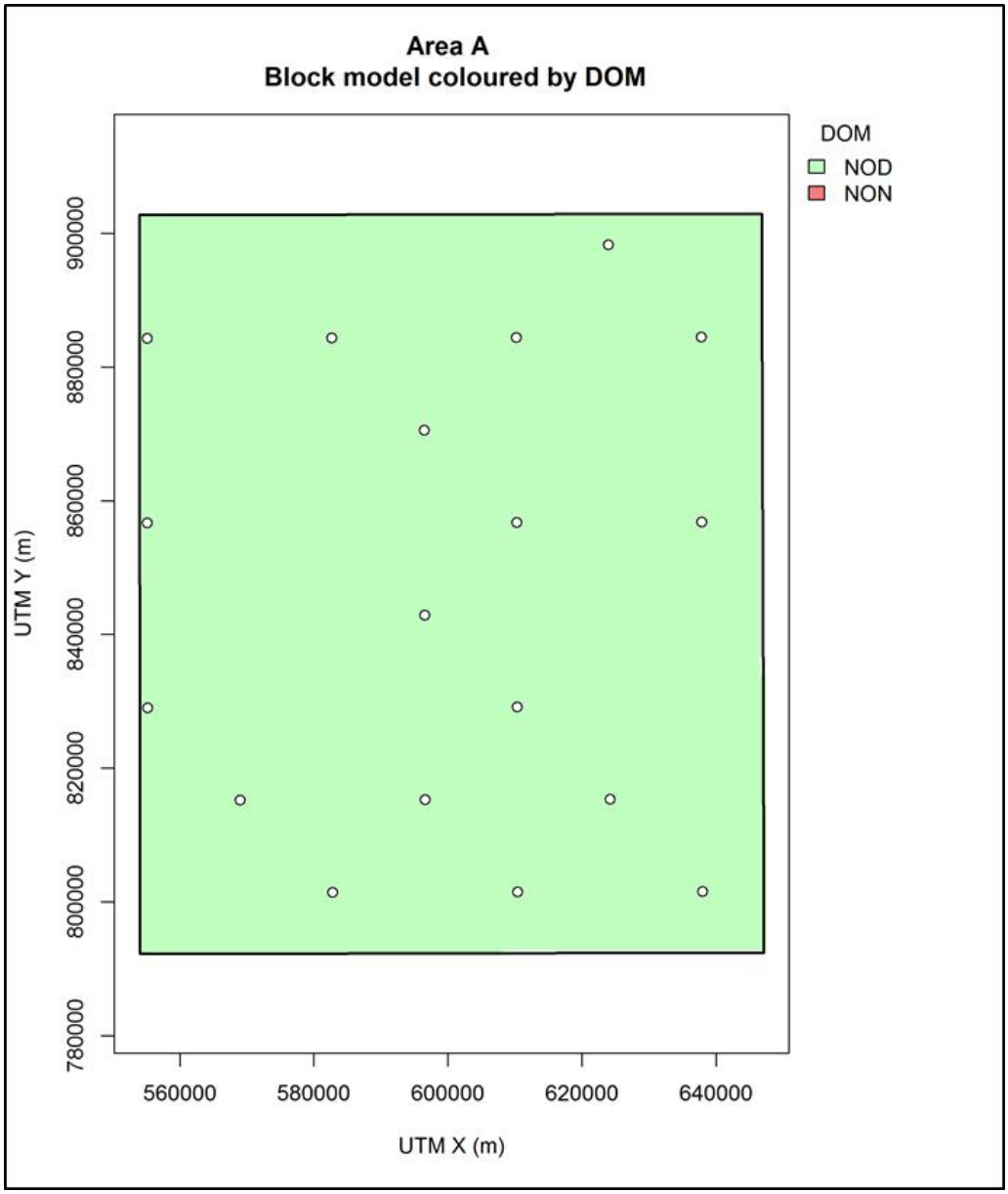


Figure 11.2 TOML Exploration Area B geological domains

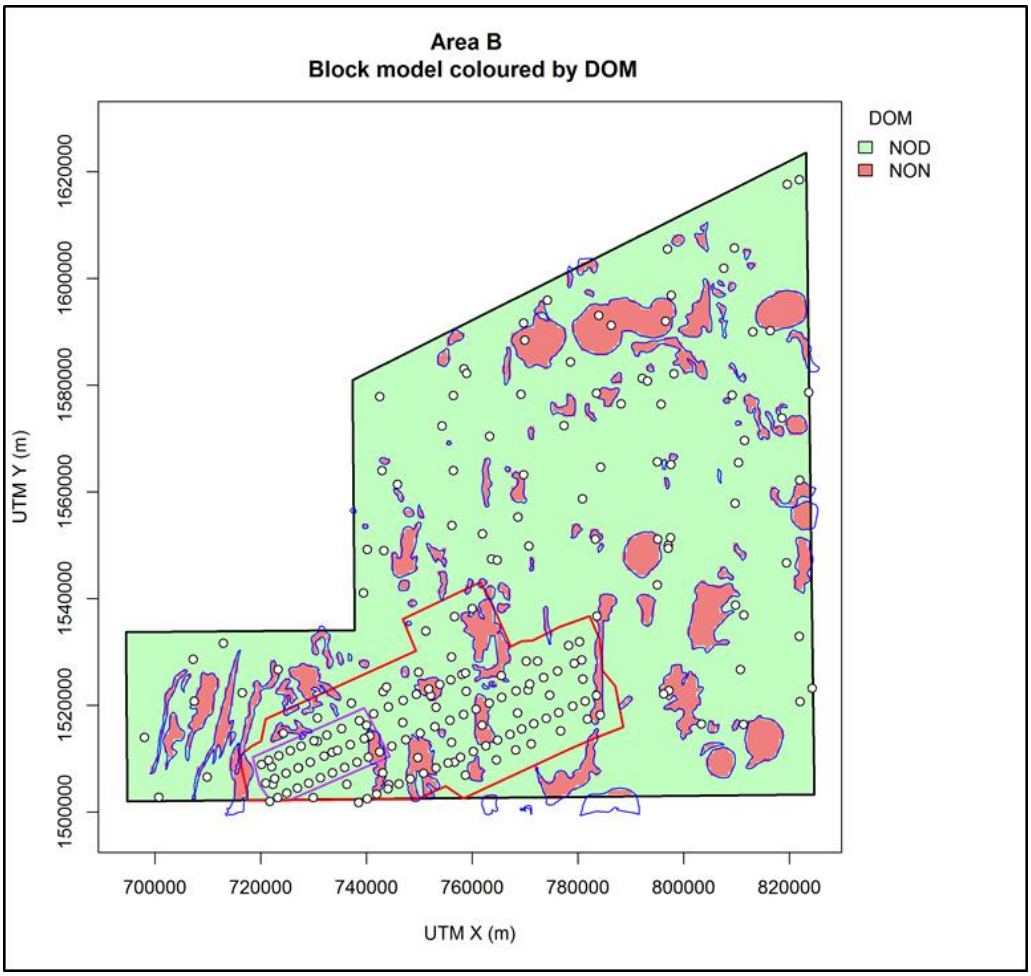


Figure 11.3 TOML Exploration Area C geological domains

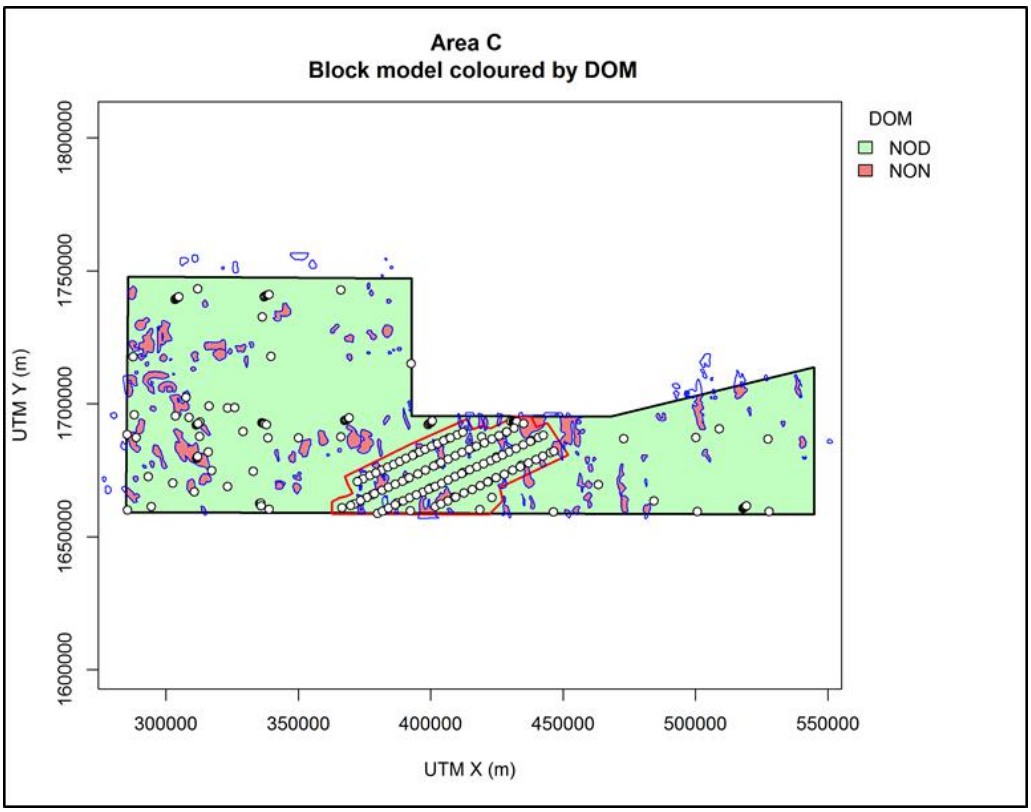


Figure 11.4 TOML Exploration Area D and E geological domains

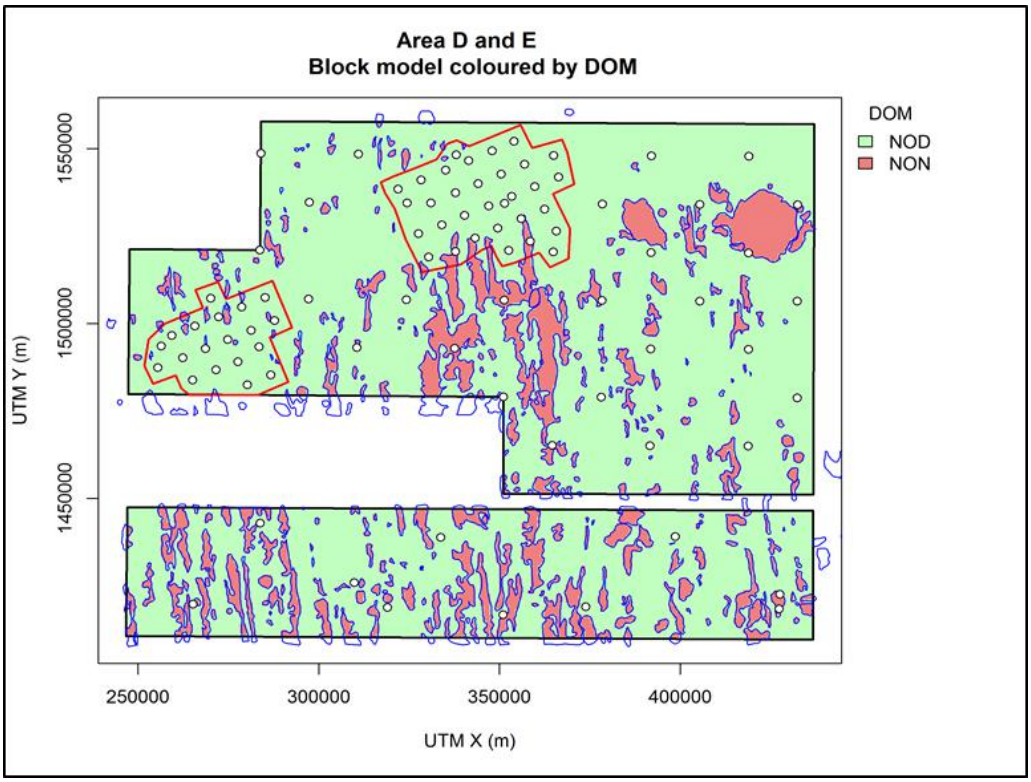
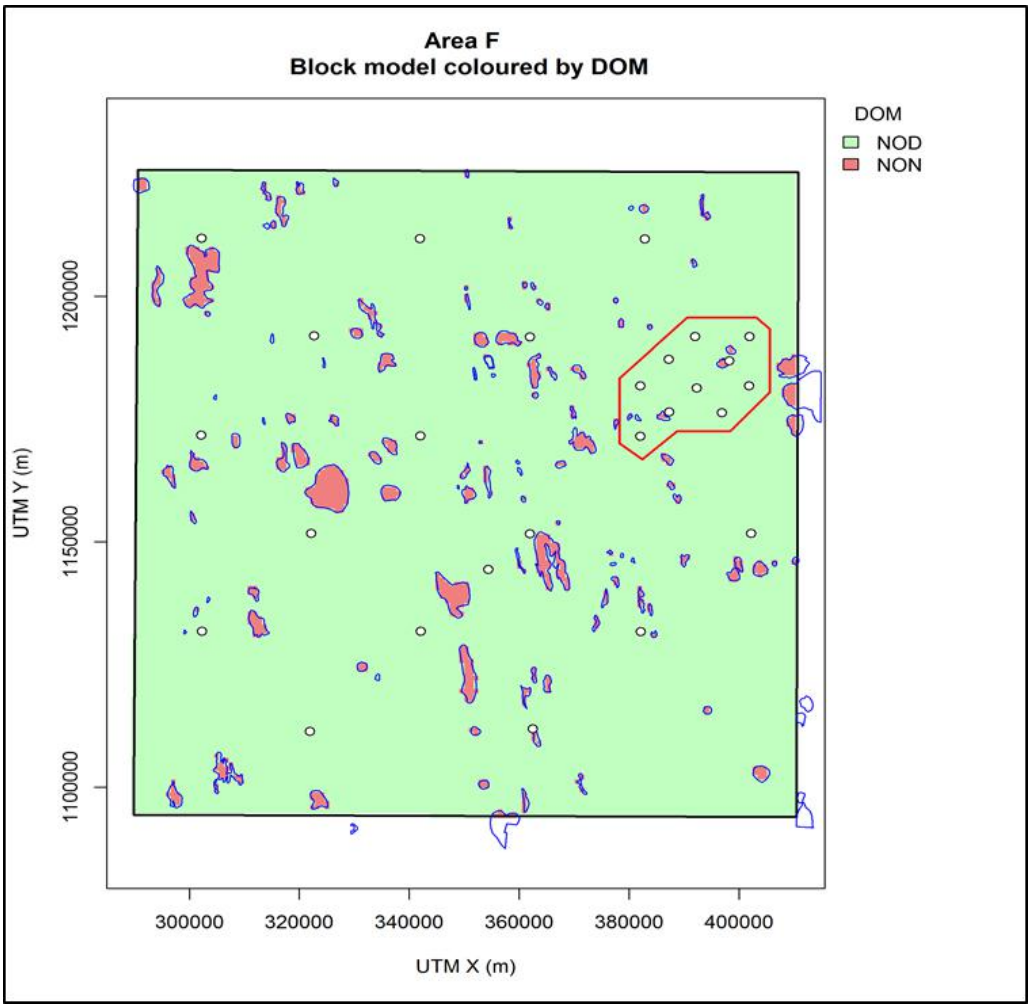


Figure 11.5 TOML Exploration Area F geological domains



11.2 Manganese Nodule Data used for the Mineral Resource Estimate

11.2.1 Description of data

Historical box-core and free fall grab sampling data was initially provided by Dr Vijay Kodagali, Senior Scientific Officer of the International Seabed Authority (Email: vkodagali@isa.org.jm) who sent the data by email in Microsoft Excel format on June 22 2012. This data included samples for TOML Exploration Areas A, B, C, D, E and F (Figure 11.6). An additional eight samples within Area E were provided by Tomasz Abramowski from Interoceanmetal Joint Organization (IOM) on 21 November 2014. The data were provided in comma delimited format.

The historical polymetallic nodule sample data consists of 2211 records of which only 268 of the nodule samples fall within the TOML Exploration Area.

Polymetallic nodule samples collected during the TOML 2015 campaign within the TOML Exploration Areas B, C, D, and F were analysed by ALS Laboratories and provided to the QP on 17 March 2016 in a single text file. A total of 104 box-core samples were collected and sampled.

A separate data set containing the manganese nodule abundance for the 113 TOML box-core samples and calculated abundance for 536 sea floor photos was provided by TOML. The calculated abundance was derived from every 100th photo of the TOML 2015 sea floor photo-profiling, providing an average spacing of 2.7 km between photo observation points. The photos were processed manually by measuring the long axis of every nodule within the photo or within a subset of the photo. This enabled an accurate estimate of the nodule abundance in each photo.

The spatial coordinates of the data were in digital latitude and longitude. For spatial modelling and Mineral Resource estimation the coordinates were transformed into Universal Transverse Mercator (UTM) using the World Geodetic System (WGS 84) spatial reference system. Table 11.1 lists the minimum and maximum UTM coordinates for each TOML Exploration Area.

Figure 11.6 Location of the historical sample data provided by the ISA and IOM and the TOML data

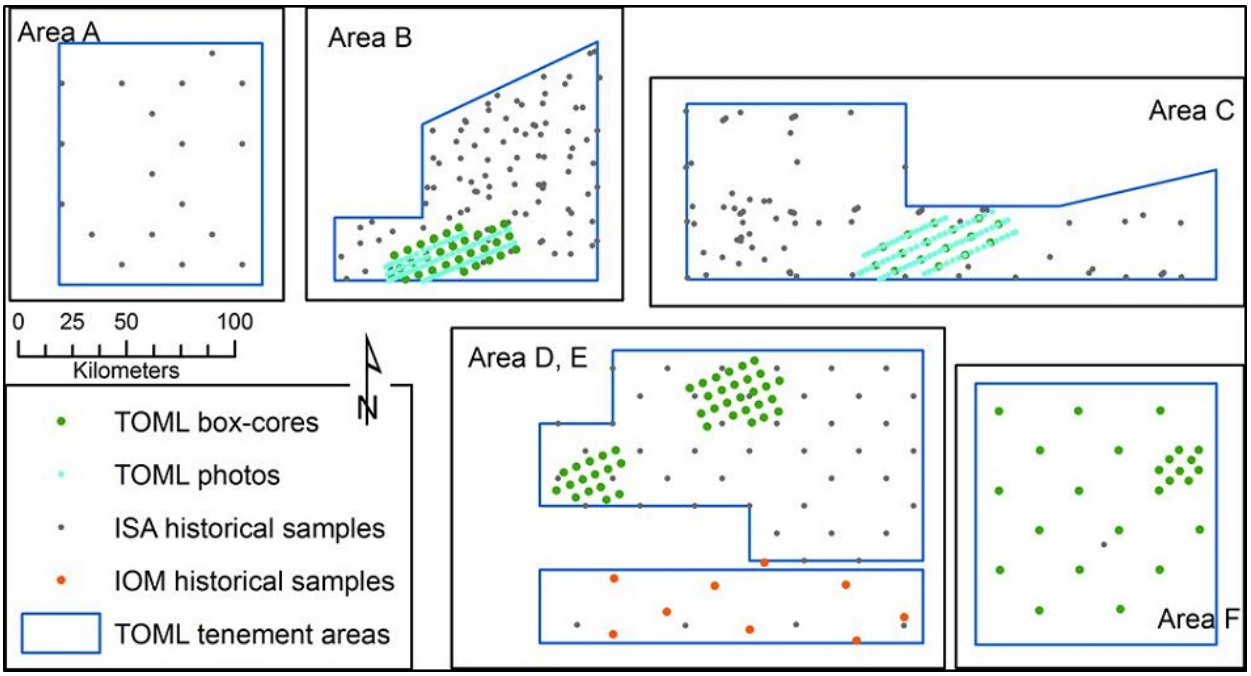


Table 11.1 Minimum and maximum UTM coordinates for each TOML Exploration Area

TOML Exploration Area	Easting		Northing		UTM Zone
	Min (m)	Max (m)	Min (m)	Max (m)	
A	553 976.1	647 191.3	792 205.9	902 969.6	5
B	694 523.4	824 684.8	1 502 007	1 623 606	8
C	284 947.0	544 795.5	1 658 368	1 747 831	9
D	247 296.3	437 027.2	1 451 032	1 557 860	10
E	246 691.9	436 798.9	1 409 560	1 447 514	10
F	289 837.4	410 806.1	1 093 913	1 225 830	11

The historical and recent TOML data were combined into a single data set and checked for anomalous or erroneous values. The 0 assay values in the historical data represent absent data and were reset to absent value where abundance is recorded as 0, and to 0.01 where abundance is greater than 0.

11.2.2 Sample statistics

The descriptive statistics of the nodule sample data are listed in Table 11.2 to Table 11.6. Comparison of the historical nodule samples within the TOML Exploration Area (Table 11.4) and the recently acquired TOML nodule samples (Table 11.5) indicate slightly higher mean grades for Abundance, Mn, Ni and Cu, and slightly lower Co for the TOML samples.

Table 11.2 Statistics of all samples within the TOML Exploration Areas

Variable	Samples	Missing	Min (%)	Max (%)	Mean (%)	Var	CV	Median
Abundance	527	9	0	30.77	9.50	43.088	0.69	8.79
Mn	338	198	6.54	33.79	27.91	13.426	0.13	28.9
Ni	338	198	0.33	1.55	1.26	0.034	0.15	1.31
Cu	338	198	0.22	1.51	1.09	0.046	0.2	1.16
Co	338	198	0.02	0.35	0.23	0.002	0.21	0.23

Var = variance; CV = coefficient of variation

Declustering weights were calculated and applied to the nodule sample data to assess the potential bias in the descriptive statistics that can arise from clustering of sample data. Table 11.3 lists the declustered nodule descriptive statistics for all samples within the TOML Exploration Area. Declustering the data resulted in a slight increase in the mean of Abundance, but no significant change for Mn, Cu and Co indicating that the statistics are not significantly affected by clustering.

Table 11.3 Declustered statistics of all polymetallic nodule samples within TOML Exploration Area

Variable	Samples	Missing	Min (%)	Max (%)	Mean (%)	Var	CV	Median
Abundance	527	9	0	30.77	10.20	39.35	0.61	9.16
Mn	338	198	6.54	33.79	28.09	10.414	0.11	28.71
Ni	338	198	0.33	1.55	1.26	0.03	0.14	1.31
Cu	338	198	0.22	1.51	1.11	0.045	0.19	1.16
Co	338	198	0.02	0.35	0.22	0.003	0.24	0.22

Var = variance; CV = coefficient of variation

Table 11.4 Statistics of historical samples within the TOML Exploration Areas

Variable	Samples	Missing	Min (%)	Max (%)	Mean (%)	Var	CV	Median
Abundance	253	9	0.03	26.0	8.82	27.134	0.59	8.09
Mn	234	28	10.3	32.4	26.88	11.097	0.12	27.67
Ni	234	28	0.53	1.51	1.22	0.034	0.15	1.27
Cu	234	28	0.4	1.51	1.06	0.053	0.22	1.13
Co	234	28	0.02	0.35	0.24	0.002	0.18	0.24

Var = variance; CV = coefficient of variation

Table 11.5 Statistics of TOML samples within the TOML Exploration Areas

Variable	Samples	Missing	Min (%)	Max (%)	Mean (%)	Var	CV	Median
Abundance	113	0	0.0	29.13	12.23	66.384	0.67	12.6
Mn	104	9	6.54	33.79	30.23	11.006	0.11	30.84
Ni	104	9	0.33	1.55	1.34	0.025	0.12	1.37
Cu	104	9	0.22	1.43	1.18	0.019	0.12	1.2
Co	104	9	0.08	0.31	0.21	0.003	0.24	0.22

Var = variance; CV = coefficient of variation

Table 11.6 Statistics of TOML photo samples within the TOML Exploration Areas

Variable	Samples	Missing	Min (%)	Max (%)	Mean (%)	Var	CV	Median
Abundance	161	0	0	30.77	8.65	45.745	0.78	8.78

Var = variance; CV = coefficient of variation

Figure 11.7 Histogram and log-probability plot of Abundance for all samples within TOML Exploration Areas

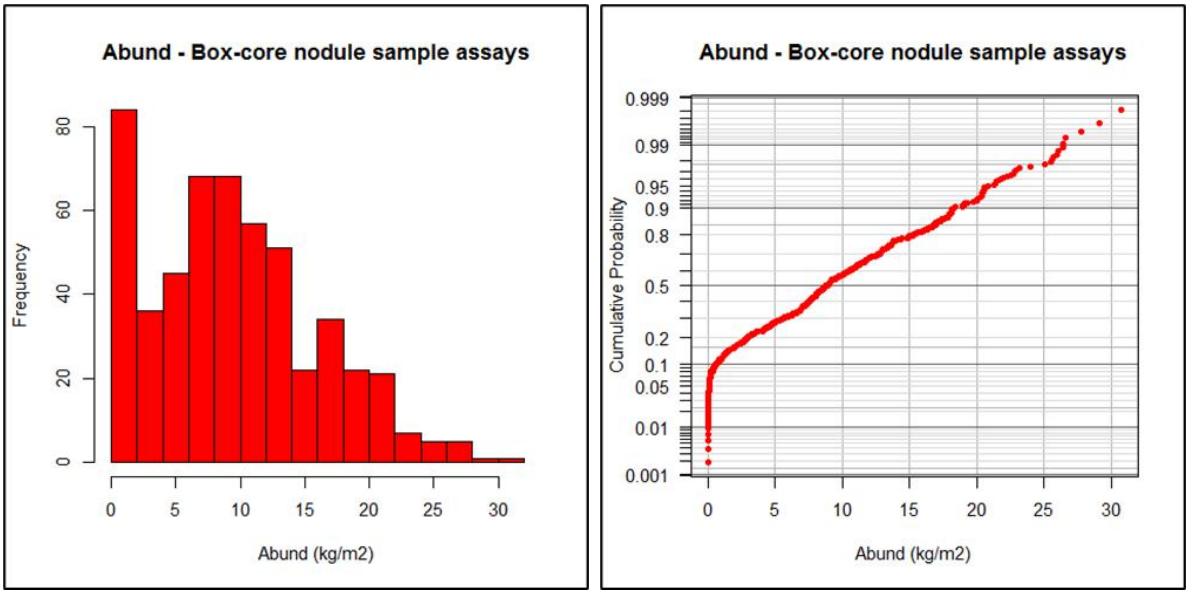


Figure 11.8 Histogram and log-probability plot of Mn for all samples within TOML Exploration Areas

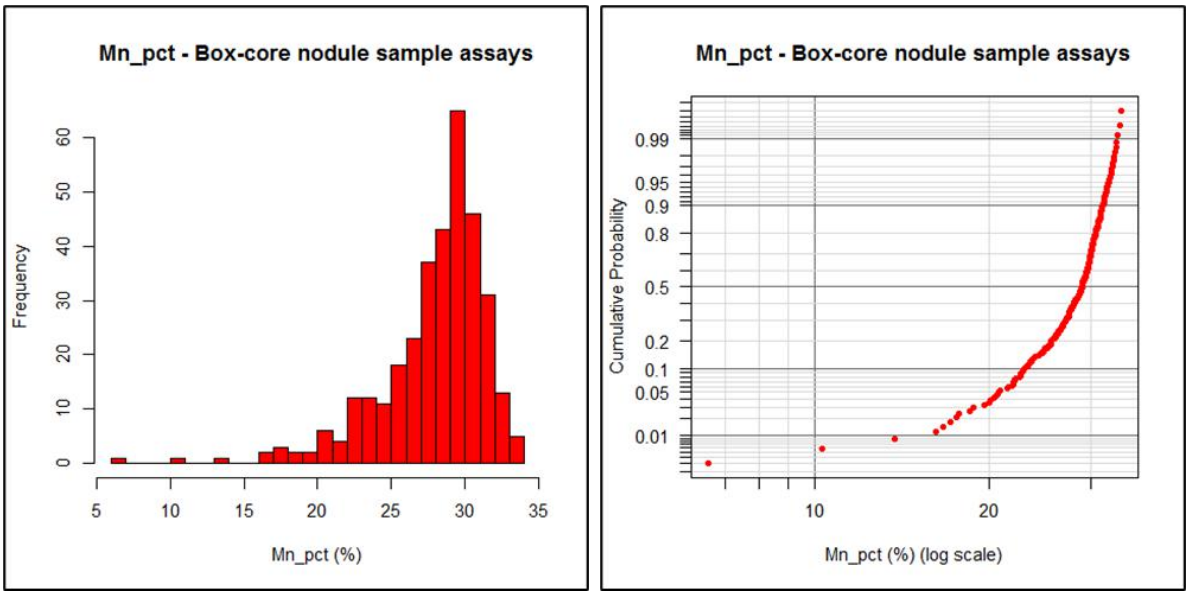


Figure 11.9 Histogram and log-probability plot of Ni for all samples within TOML Exploration Areas

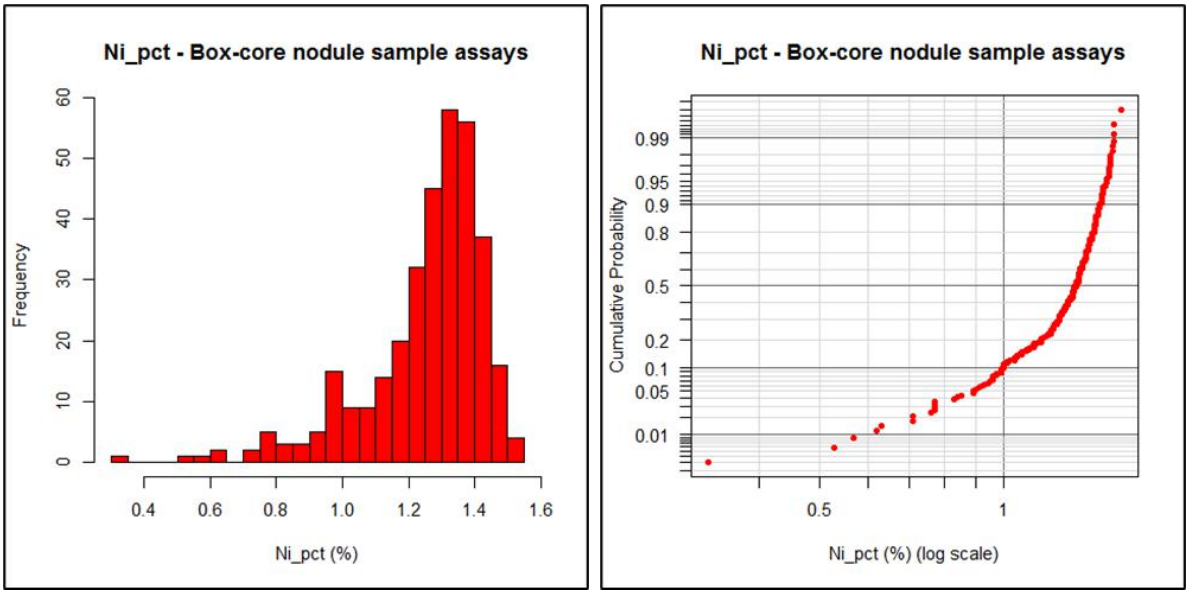


Figure 11.10 Histogram and log-probability plot of Cu for all samples within TOML Exploration Areas

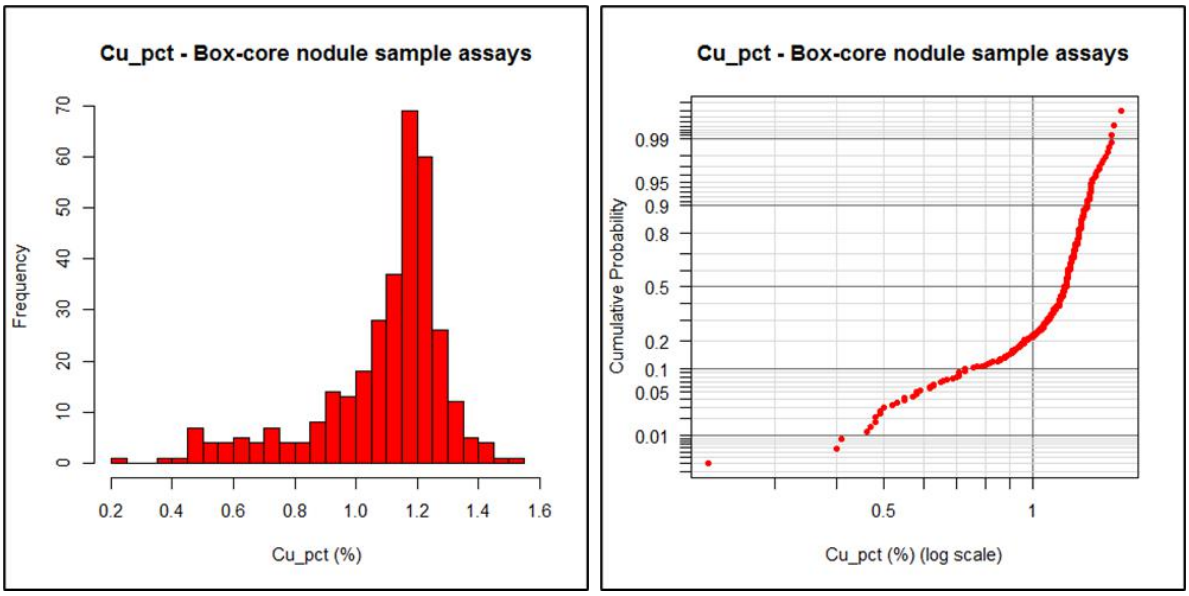
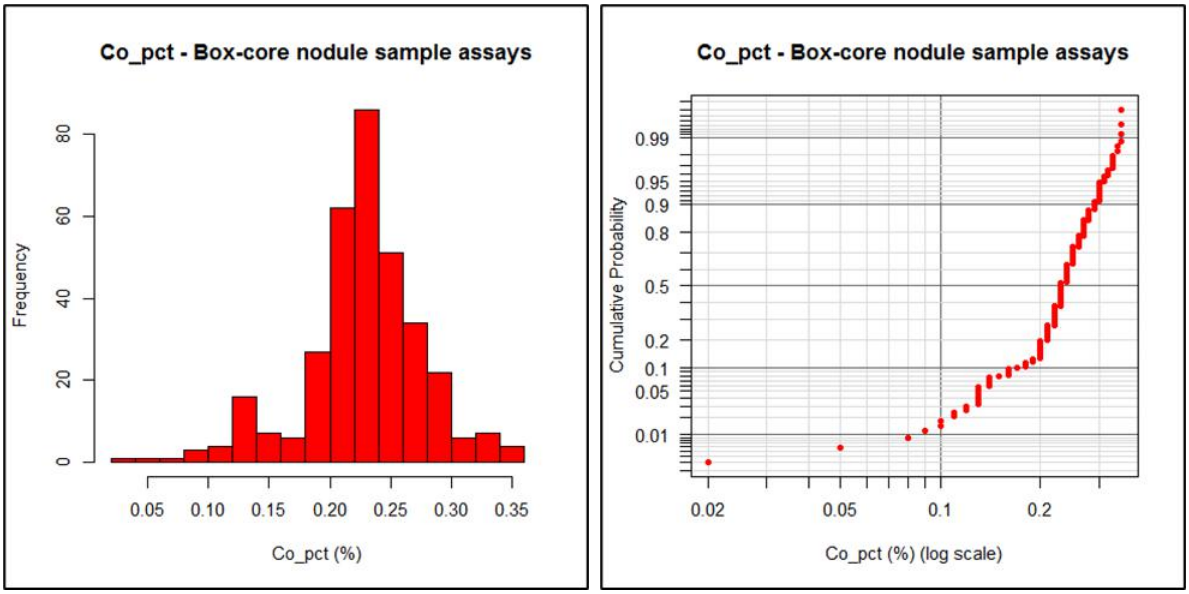
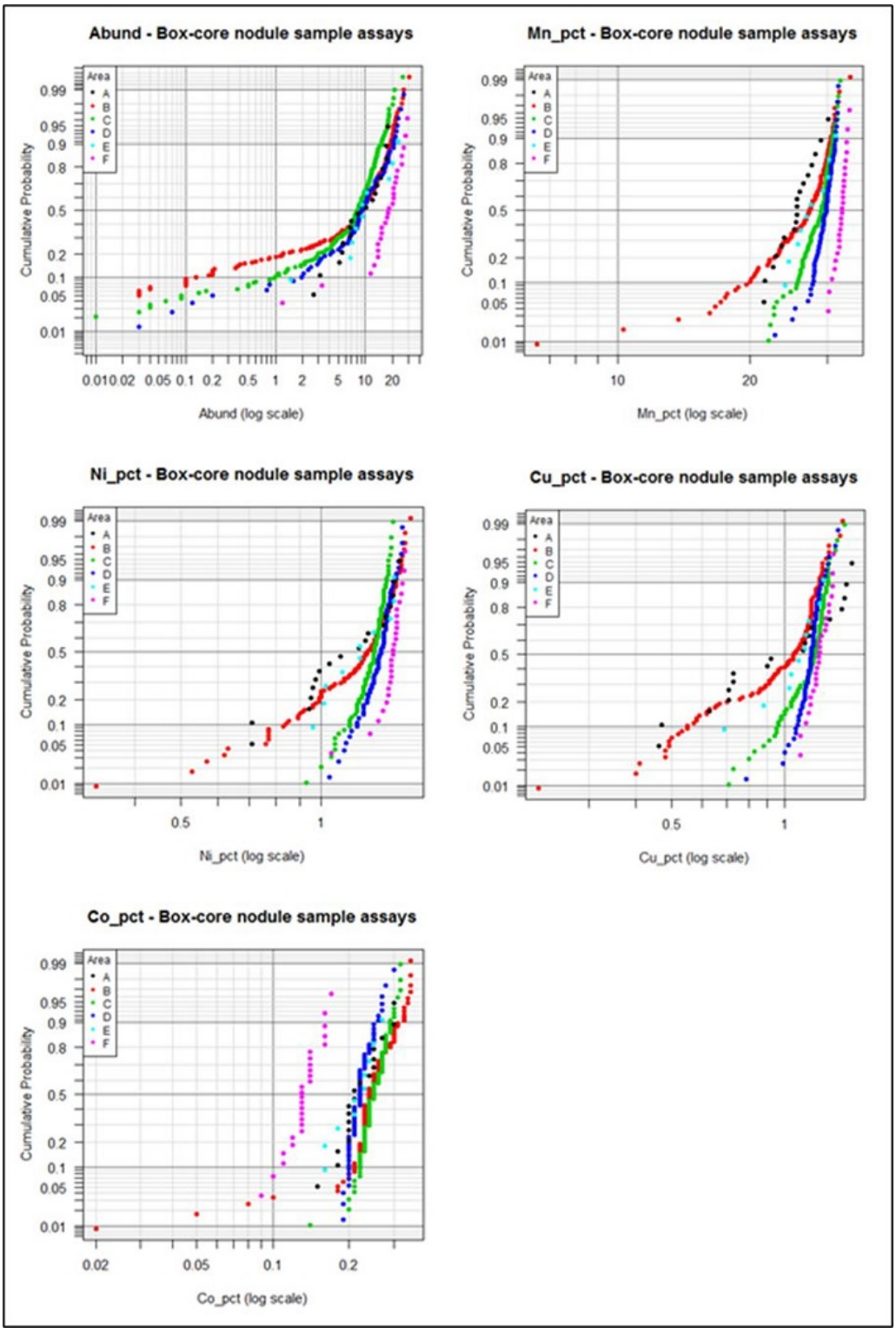


Figure 11.11 Histogram and log-probability plot of Co for all samples within TOML Exploration Areas



The log-probability plots (Figure 11.12) for Abundance, Mn, Ni, Cu and Co by TOML Exploration Area indicate variations in the grade distributions between the areas (note regional grade variations illustrated in Section 6). The distributions for Ni and Cu for samples in TOML Exploration Areas A, B and E are different than the samples in Areas C, D and F. This feature is also present in the full CCZ data set and is interpreted to be due to regional-scale geological differences. Nodule samples from Area F show significantly lower Co than samples from all the other areas while Mn shows a gradual increase from Areas A and B through to Area F.

Figure 11.12 Log-probability plots for Abundance, Mn, Ni, Cu and Co by TOML Exploration Areas



Box plots provided in Figure 11.12 clarify the differences in assays between TOML Exploration Areas. These plots also reveal that the variance in Ni and Cu is higher for TOML Exploration Areas A and B then the other areas. Also, Area E shows higher Ni variance similar to Area A and B. Area F appears to have anomalously high Mn with a much lower variance then all other areas. Area F appears to also have higher median Ni and Cu and significantly lower Co values.

Box-plots summarising molybdenum and the light and heavy rare earth elements are provided in Figure 11.14 to Figure 11.16. At this stage reasonable prospects of economic extraction have not been demonstrated for these elements and so they have not been estimated as part of the Mineral Resource.

Figure 11.13 Box-plots for Abundance, Mn, Ni, Cu and Co by TOML Exploration Areas

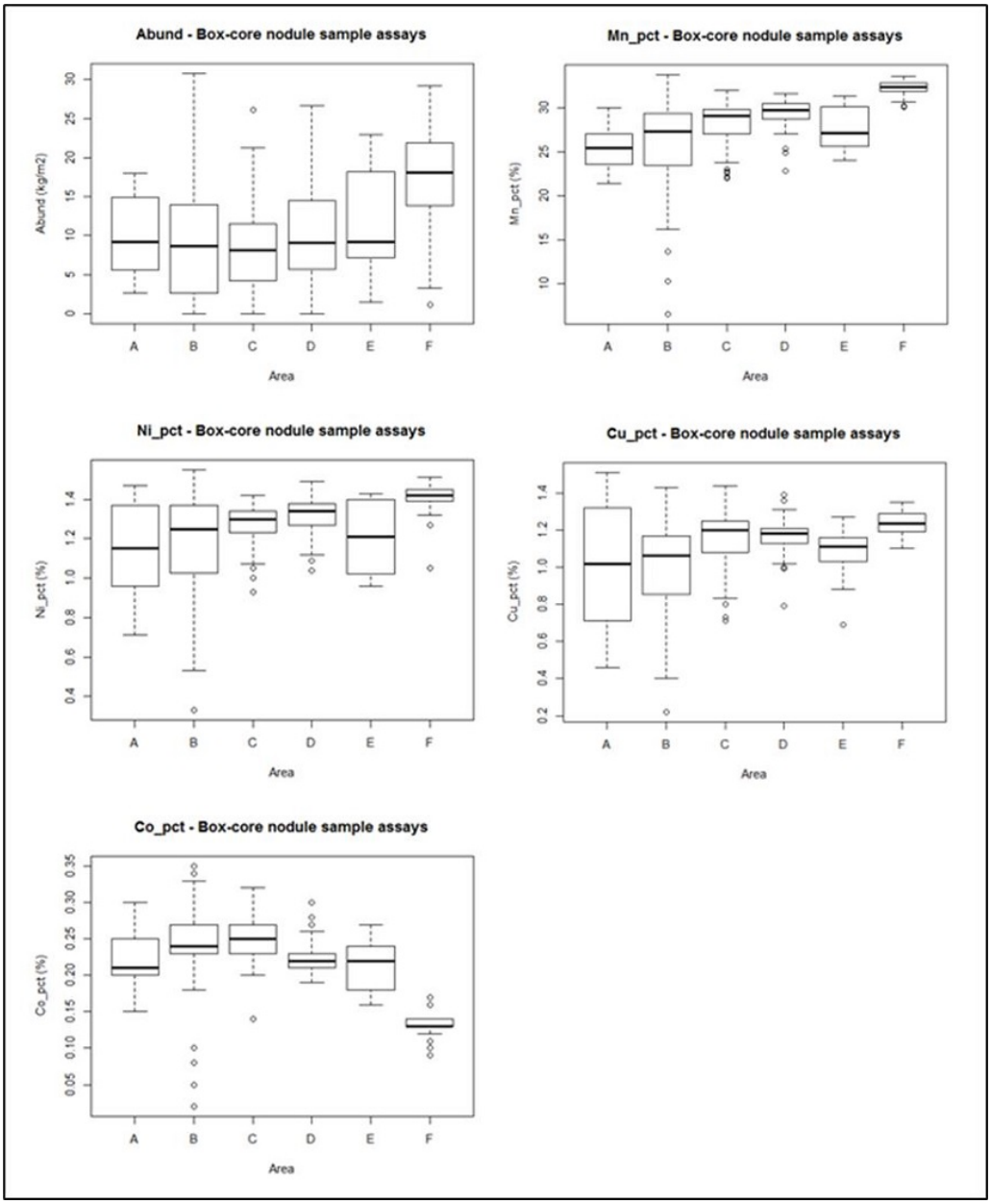


Figure 11.14 Box-plot of Mo for sample data within the TOML Exploration Areas

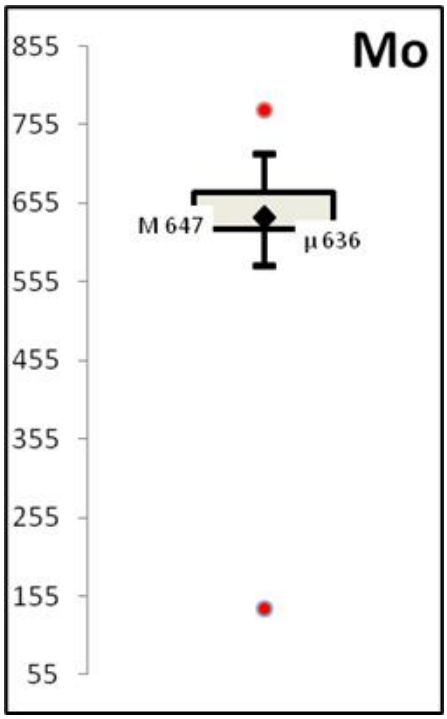


Figure 11.15 Box-plot of light rare earth elements for sample data within the TOML Exploration Areas

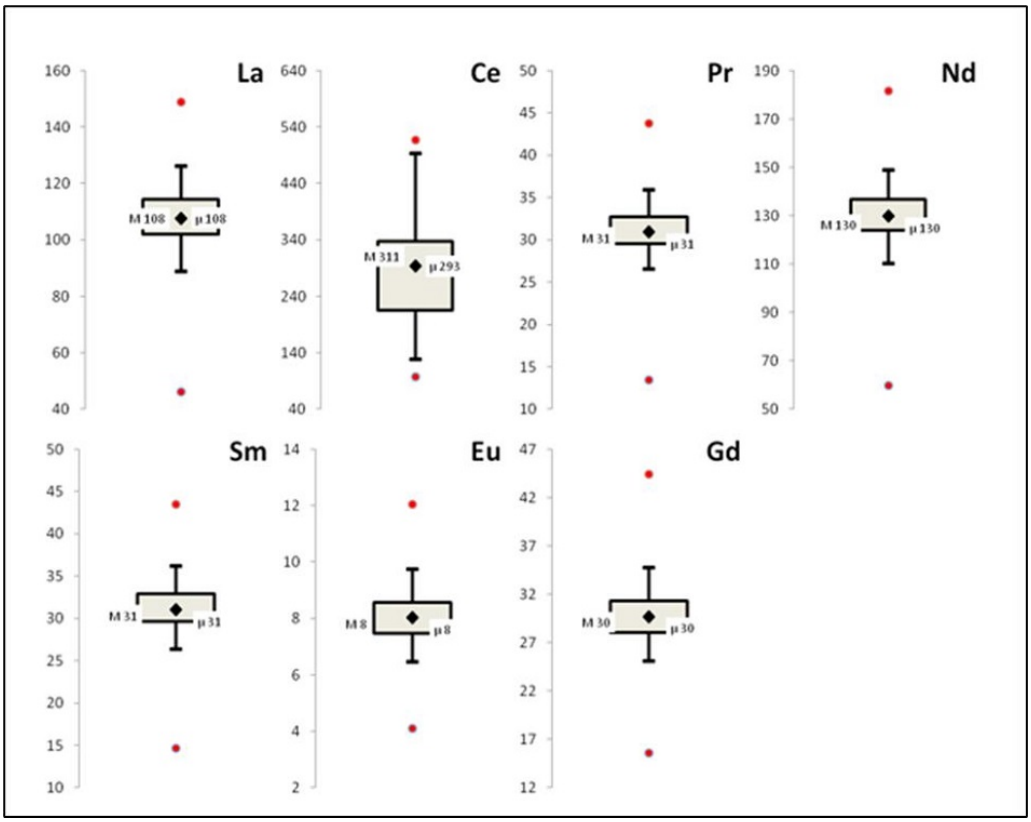
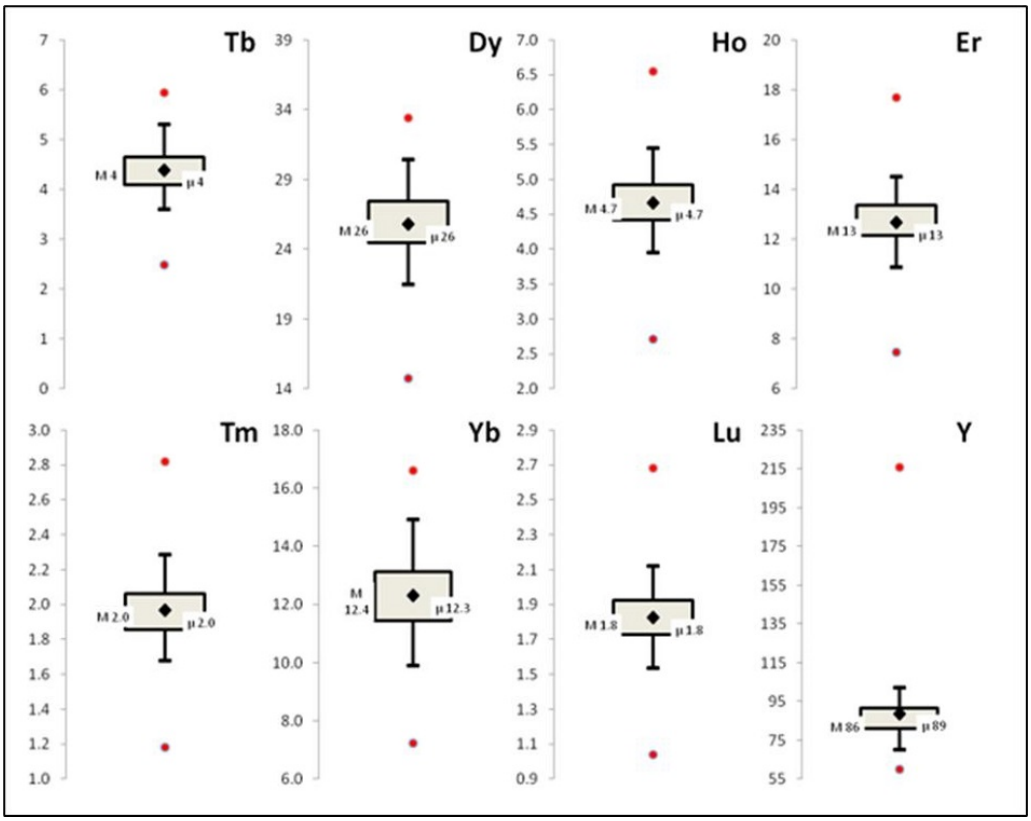


Figure 11.16 Box-plot of heavy rare earth elements for sample data within the TOML Exploration Areas



The coefficients of variation are very small for nodule Abundance, Mn, Ni, Cu and Co suggesting that the application of top-cuts is not necessary. Also, the approximate natural limits for absorption of the Ni (~6.02%), Cu (~8.03) and Co (~6.60%) metals, suggested in the study by Novikov and Bogdanova (2007), are significantly higher than the maximum values (Ni=1.55%, Cu=1.51%, Co=0.35%) in the data. This suggests that all the Ni, Cu and Co values are within natural limits.

The presence of outliers (or ‘extreme’ values) was assessed by examining the summary statistics and probability plots. No outliers were detected.

Top cuts were not applied to the data prior to grade estimation.

11.2.3 Representativeness of sampling

In-fill box core sampling by TOML in 2015 confirmed the presence of nodules at similar grade and abundance to the wider spaced historical sampling. A comparison between the mineral resource estimates is further below.

TOML also collected continuous sea floor photo profiles along three (3) lines in Area B and four (4) lines in Area C.

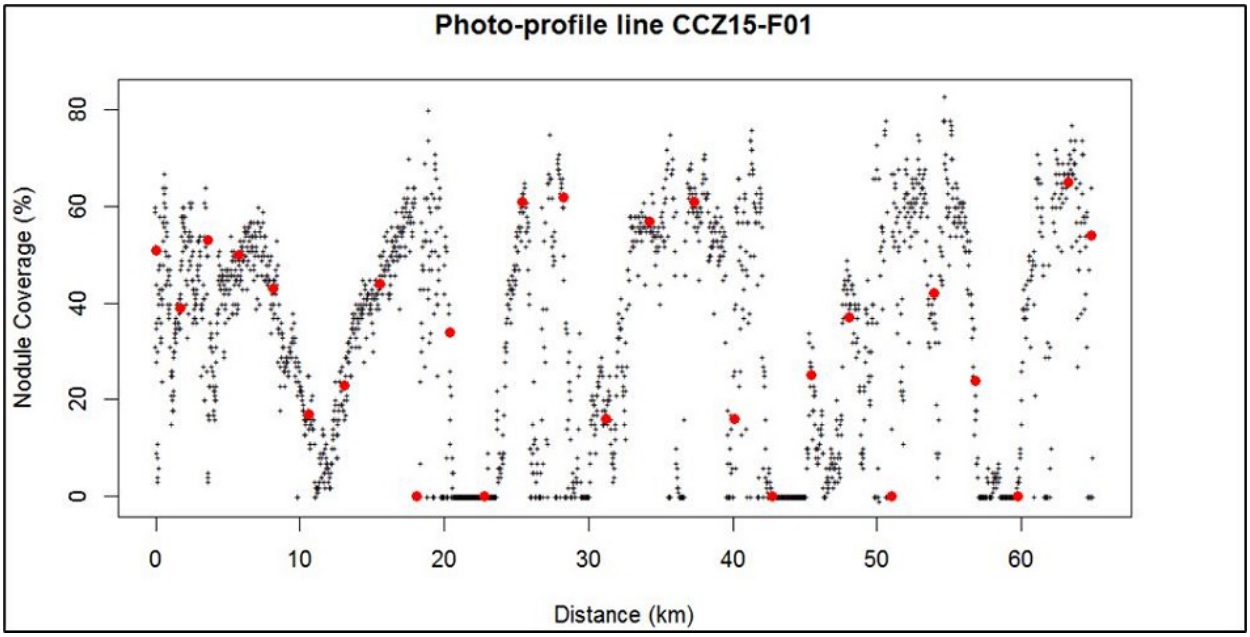
From these photos it is possible to derive the percent of nodule coverage using automated image processing techniques. The percent nodule coverage is the amount of image pixels identified as nodules divided by the total number of pixels in the photo. It is also possible to use the long-axis estimation method for determining nodule abundance. However, this method is time consuming to process a single image as the long axis of every nodule is picked manually. An accurate, repeatable and robust automated computer implementation of LAE is being developed by a Nautilus contractor and is currently in the prototype stage.

The nodule percent coverage estimated from the sea floor photos shows a positive correlation with nodule abundance (Figure 11.20). Nodule percent coverage can be used as a proxy for nodule abundance although it is at best a moderate estimator (Figure 11.20).

Plots of the nodule percent coverage for the three lines that cross the TOML Exploration sub-area B1 are shown in Figure 11.17 to Figure 11.19.

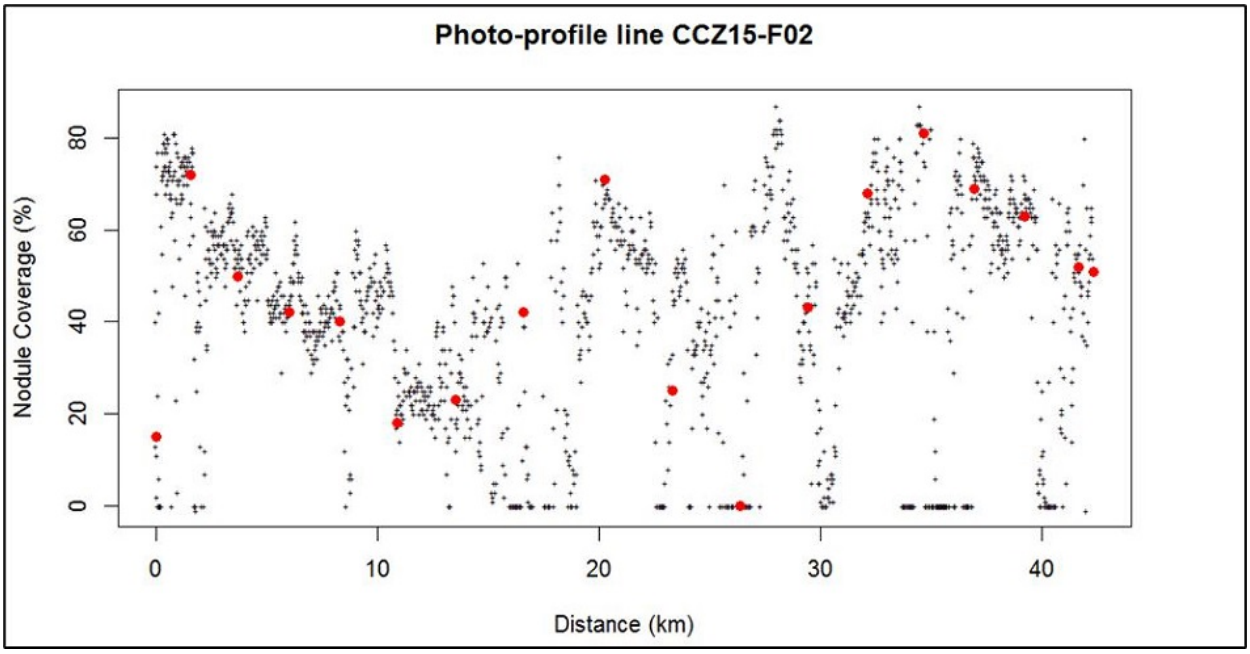
These plots show the presence of nodules between box-core locations. Note that the average distance between each photo is approximately 25 m and ranges from 5 m to 79 m.

Figure 11.17 Photo-profile line CCZ15-F01 that crosses Area B1 Mineral Resource



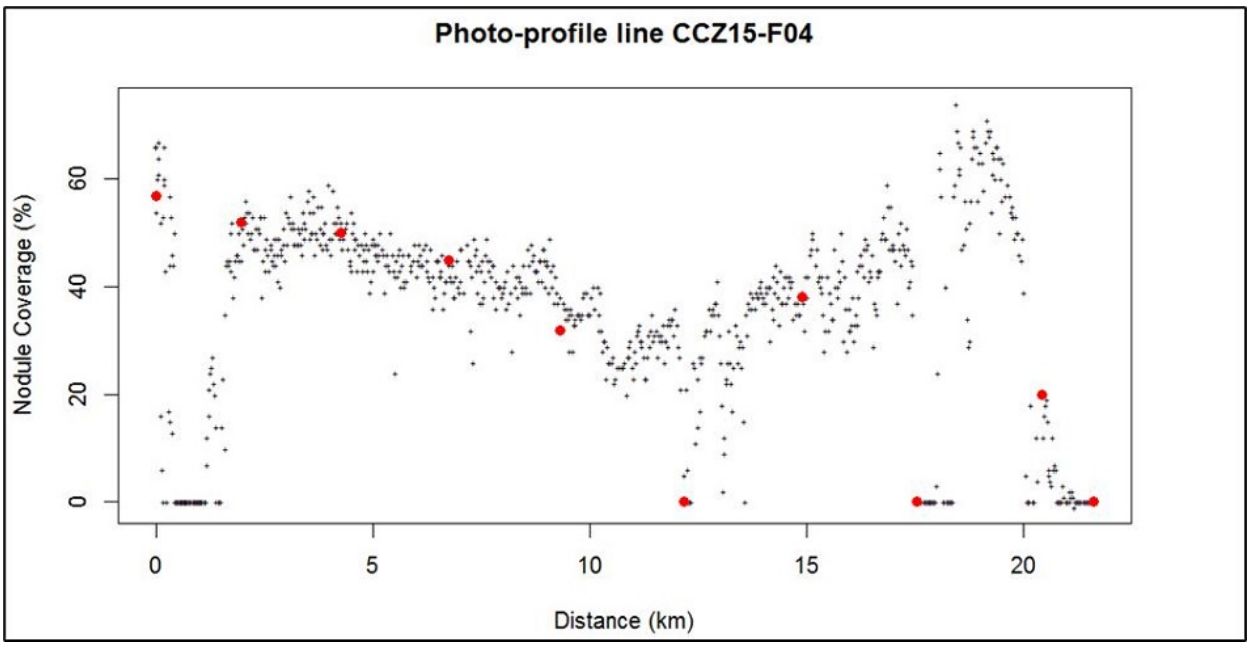
Red dots – nodule coverage for seafloor photos which were used in the manual estimate of abundance using the long-axis estimation method and used in the Mineral Resource estimate. Black dots – nodule abundance for all other seafloor photos.

Figure 11.18 Photo-profile line CCZ15-F02 that crosses Area B1 Mineral Resource



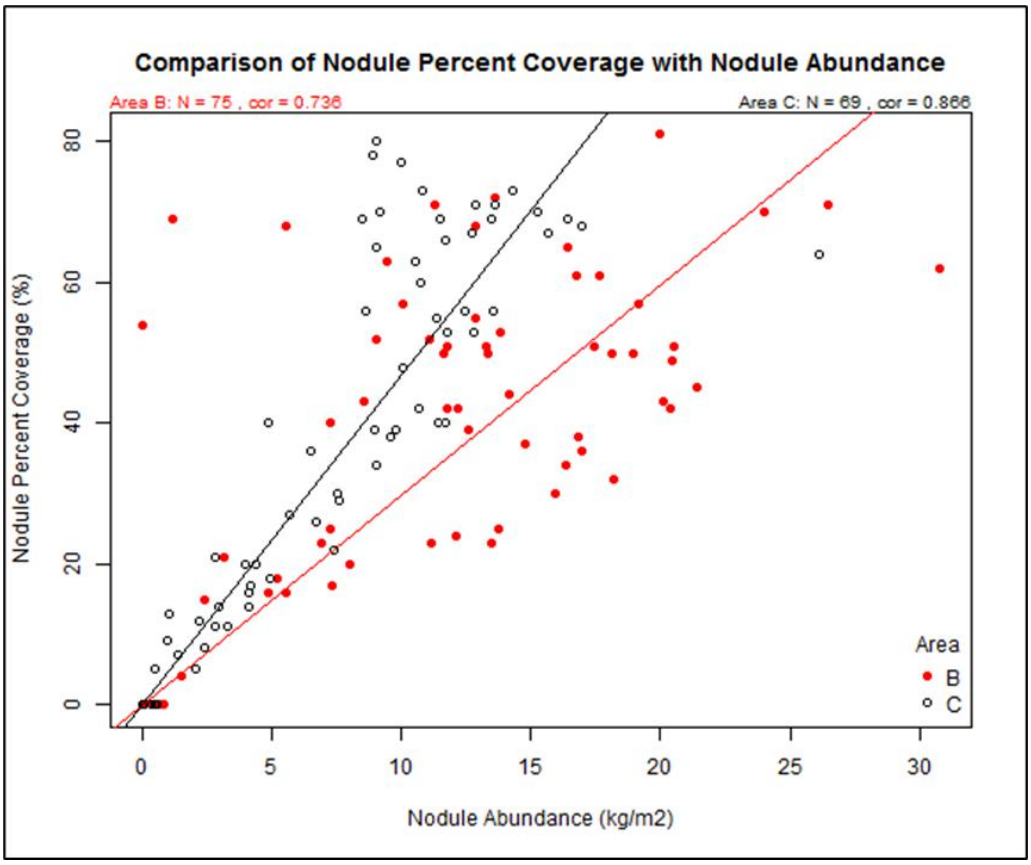
Red dots – nodule coverage for seafloor photos which were used in the manual estimate of abundance using the long-axis estimation method and used in the Mineral Resource estimate. Black dots – nodule abundance for all other seafloor photos.

Figure 11.19 Photo-profile line CCZ15-F04 that crosses Area B1 Mineral Resource



Red dots – nodule coverage for seafloor photos which were used in the manual estimate of abundance using the long-axis estimation method and used in the Mineral Resource estimate. Black dots – nodule abundance for all other seafloor photos.

Figure 11.20 Comparison of nodule percent coverage against nodule abundance

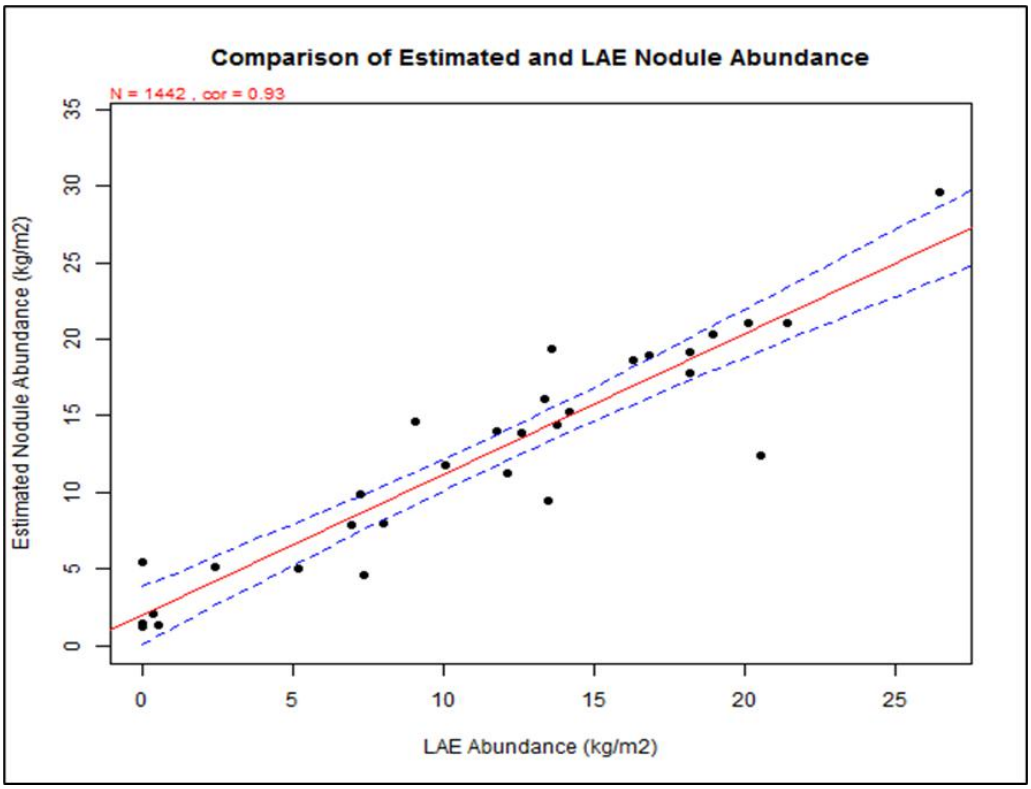


A total of 2754 seafloor photos from the photo profile lines CCZ15-F01, CCZ15-F02 and CCZ15-F04, using an image analysis program to estimate the long axis dimensions of nodules in the photos. These photo-profile lines cover the Measured Mineral Resource area within TOML sub-area B1. The long axis estimates were then used to estimate the nodule abundance for each photo. This data was not required or used in estimation of the Mineral Resource, but they do support it.

There is very good agreement between the nodule abundance estimated from automated analysis of the seafloor photos and the nodule abundance estimated from manual measurement of the nodule long-axis (Figure 11.21). Refinement of the automated method is likely to result in even better correlation with the manual method. The benefit of the automated method is reduced time in processing each image which enables more images to be processed. This will enable almost complete mapping of nodule abundance within selected areas prior to nodule harvesting and can be used in a grade control system.

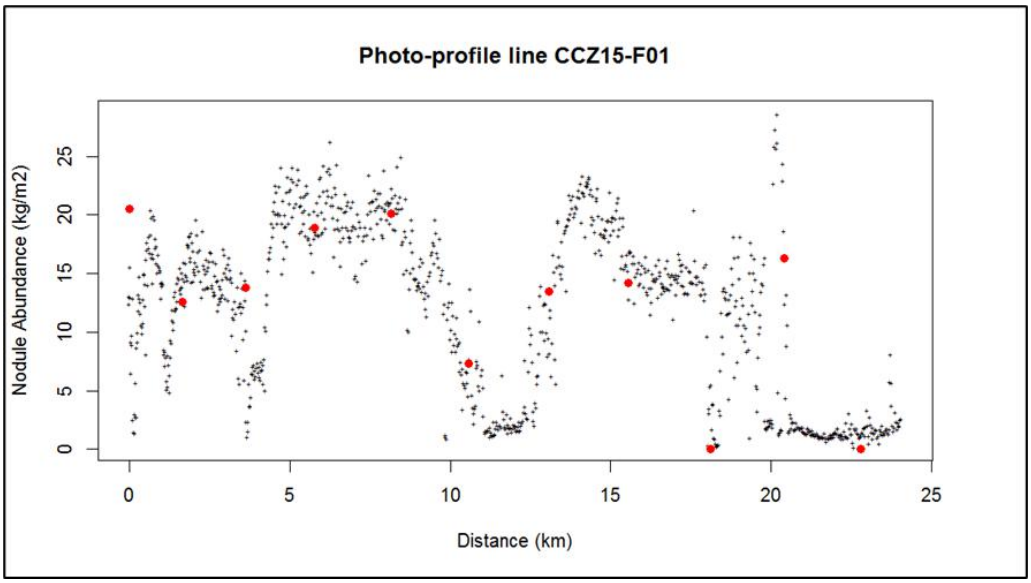
Figure 11.22 to Figure 11.24 show plots of the nodule abundance estimated from the seafloor photos. Note that the distance between each photo is approximately 30 m.

Figure 11.21 Comparison of nodule abundance estimated from photos against nodule abundance estimated manually using the long-axis estimation method



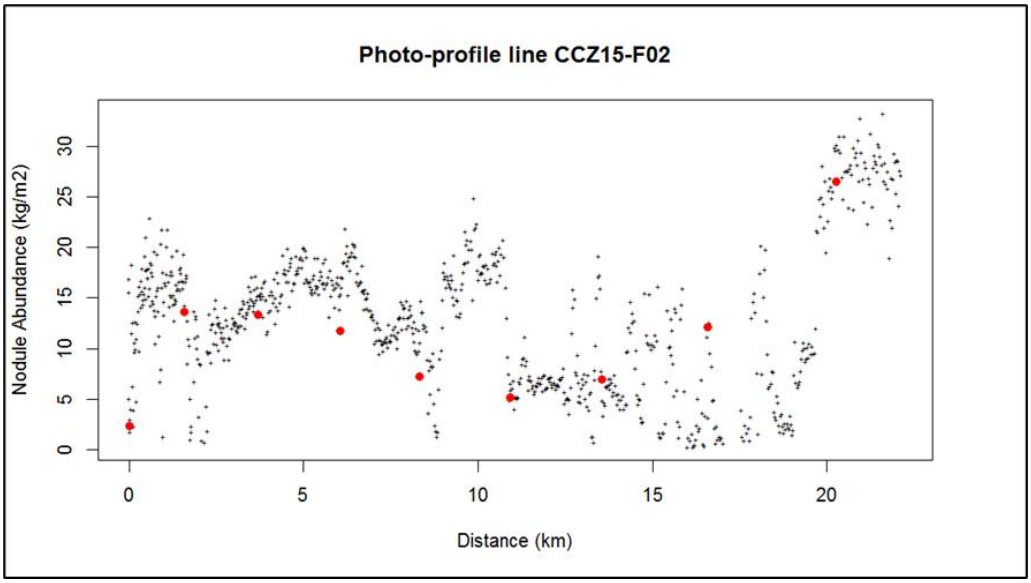
The red line is the fitted linear regression. The blue dashed lines are the 95% confidence intervals for the linear regression model.

Figure 11.22 Nodule abundance photo-profile line CCZ15-F01 that crosses sub-area B1 Measured Mineral Resource



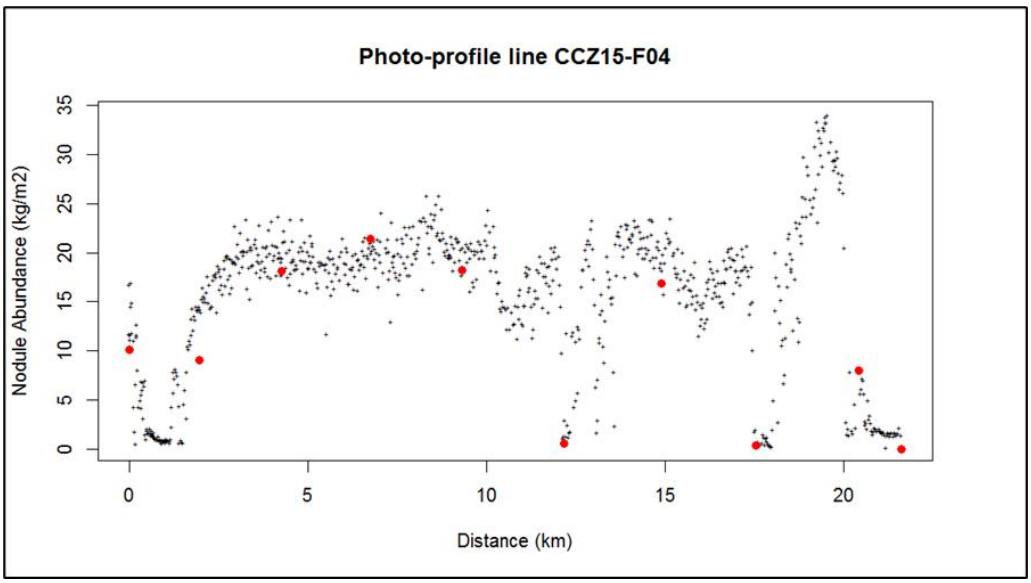
Red dots – nodule coverage for seafloor photos which were used in the manual estimate of abundance using the long-axis estimation method and used in the Mineral Resource estimate. Black dots – nodule abundance for all other seafloor photos.

Figure 11.23 Nodule abundance photo-profile line CCZ15-F02 that crosses sub-area B1 Measured Mineral Resource



Red dots – nodule coverage for seafloor photos which were used in the manual estimate of abundance using the long-axis estimation method and used in the Mineral Resource estimate. Black dots – nodule abundance for all other seafloor photos.

Figure 11.24 Nodule abundance photo-profile line CCZ15-F04 that crosses sub-area B1 Measured Mineral Resource



Red dots – nodule coverage for seafloor photos which were used in the manual estimate of abundance using the long-axis estimation method and used in the Mineral Resource estimate. Black dots – nodule abundance for all other seafloor photos.

Polymetallic nodule grades (Table 11.2) within the CCZ have very low coefficients of variation which indicate a low risk in estimating grades and that ordinary kriging is an appropriate technique to use for estimation. The dredge sampling programme conducted by TOML on polymetallic nodules during their 2013 campaign, included analysis of multiple individual nodules taken from each dredge sample. It confirmed the very low variance in the nodule grades at the local scale.

Variograms of the polymetallic nodule grades of Mn, Ni, Cu and Co within the TOML Exploration Area show reasonable spatial continuity with ranges greater than the average sample spacing. The long variogram ranges for the nodule grades reflect the very large-scale diffuse distribution of metals within the ocean water column and that the manganese acts like a sponge absorbing the metals. The variogram for abundance, on the other hand, has significantly shorter ranges. This reflects the mechanism of nodule formation and the less continuous distribution of nodules.

The Qualified Person considers that the box-core and free fall grab sample spacing within the TOML Exploration Areas A to F are sufficient to demonstrate continuity of Mn, Ni, Cu and Co. The addition of photo profiling enables confidence in the continuity of nodule abundance and can be reasonably assumed on the basis of the scale of the deposit and the mechanisms of nodule formation.

11.3 Geostatistics

11.3.1 Nodule sample variography

All manganese nodule samples (historical box-core and free fall-grabs, TOML box-core and photos) within the TOML Exploration Area were combined and used for analysis of spatial continuity (autocorrelation). The experimental semi-variograms were scaled to the population variance. Variogram maps (Figure 11.30) were calculated for the purpose of determining the direction of greatest continuity.

Spherical semi-variogram models were fitted to the experimental variograms using two structures (Table 11.7). Where possible, consistent parameters were used between the fitted variogram models for each direction and each of the variables. This was done to ensure element relationships or correlations evident between samples are respected implicitly during estimation and reflected in the resource estimate. Also, the same type of variogram model was fitted to the experimental semi-variograms.

The directions of greatest continuity deduced from the variogram maps appears to be approximately 150˚ and 060˚. Abundance and Cu show no anisotropy in the variogram ranges while Mn and Ni appear to show greater continuity in the 150˚ and Co shows greater continuity in the 060˚ direction. The 060˚ direction is roughly parallel to the broad regional trend of the CCZ and the 150˚ direction is parallel to the abyssal hills. Smaller scale local trends oriented parallel with bathymetry ridges are not visible in the wide spaced data.

The variogram models listed in Table 11.7 were used in estimating the values for nodule abundance, Mn, Ni, Cu and Co.

Table 11.7 Variogram models

Variable	Nugget	Spherical Structure 1			Spherical Structure 2			Anisotropy Ratio
	C0	C1	Range H1		C1	Range H2		
			060° (km)	150° (km)		060° (km)	150° (km)	
Abundance	0.40	0.60	5	5	–	–	–	1.0
Mn	0.21	0.37	5	10	0.42	15	30	0.5
Ni	0.21	0.37	5	10	0.42	15	30	0.5
Cu	0.21	0.37	22	22	0.42	70	70	1.0
Co	0.21	0.37	22	16	0.42	70	50	0.714

Figure 11.25 Abundance omni-directional, 060˚ and 150˚ directional variograms

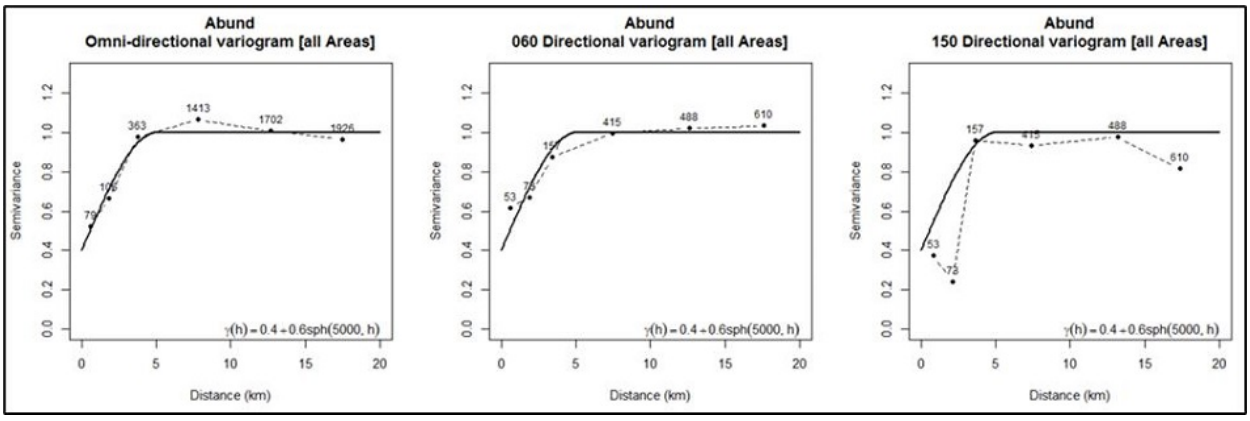


Figure 11.26 Mn omni-directional, 060˚ and 150˚ directional variograms

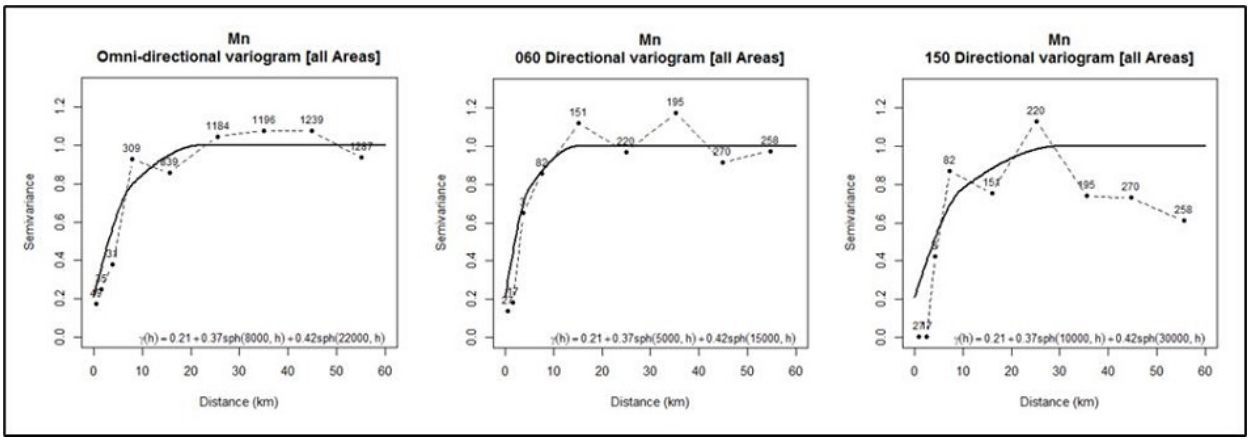


Figure 11.27 Ni omni-directional, 060˚ and 150˚ directional variograms

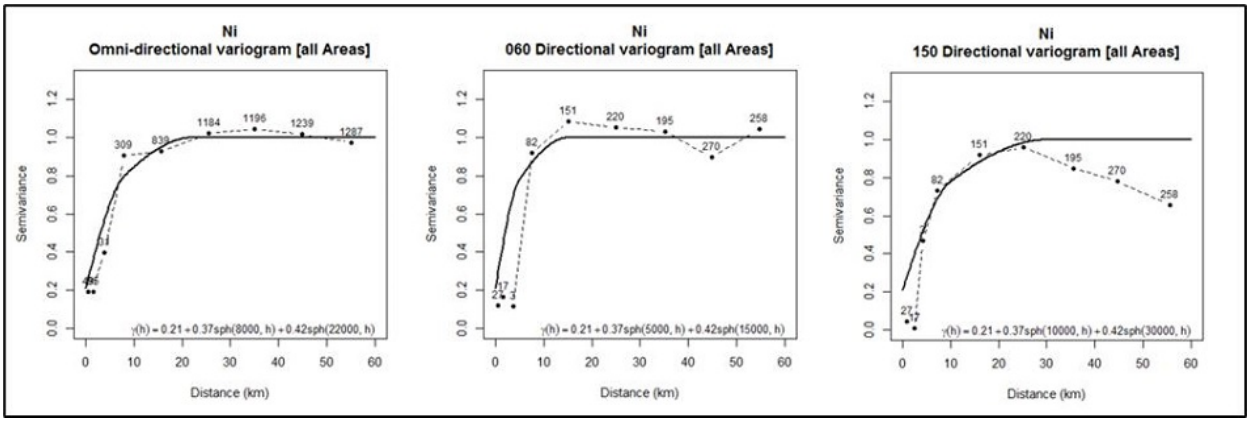


Figure 11.28 Cu omni-directional, 060˚ and 150˚ directional variograms

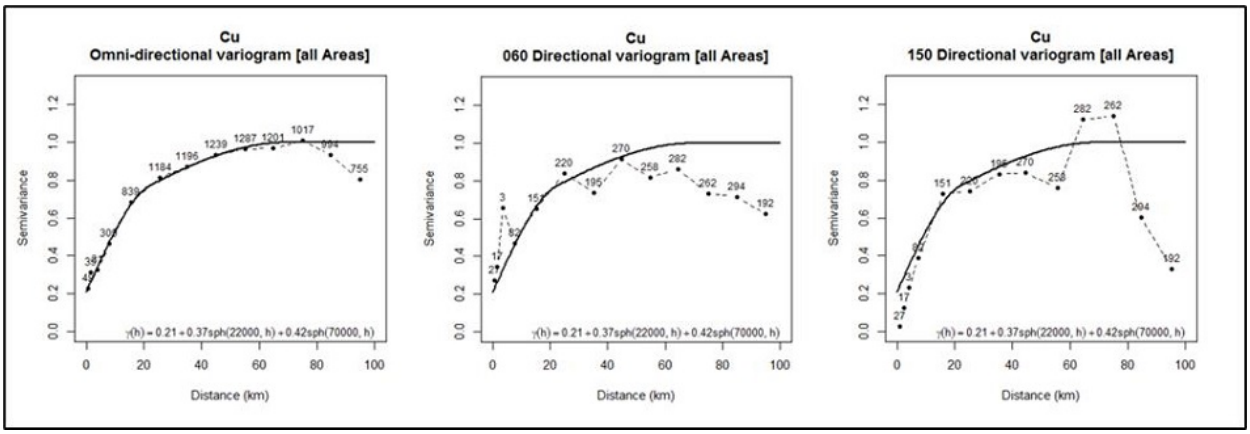


Figure 11.29 Co omni-directional, 060˚ and 150˚ directional variograms

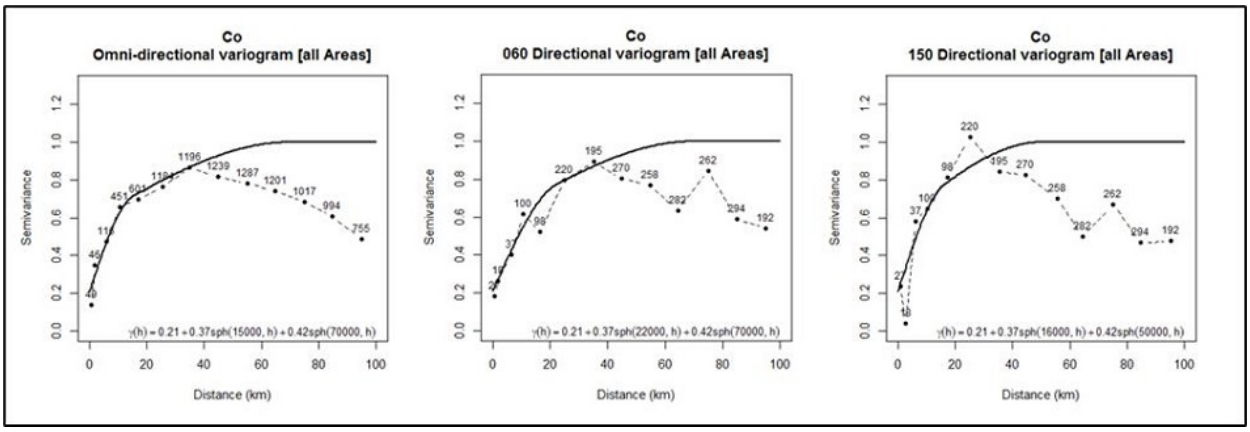
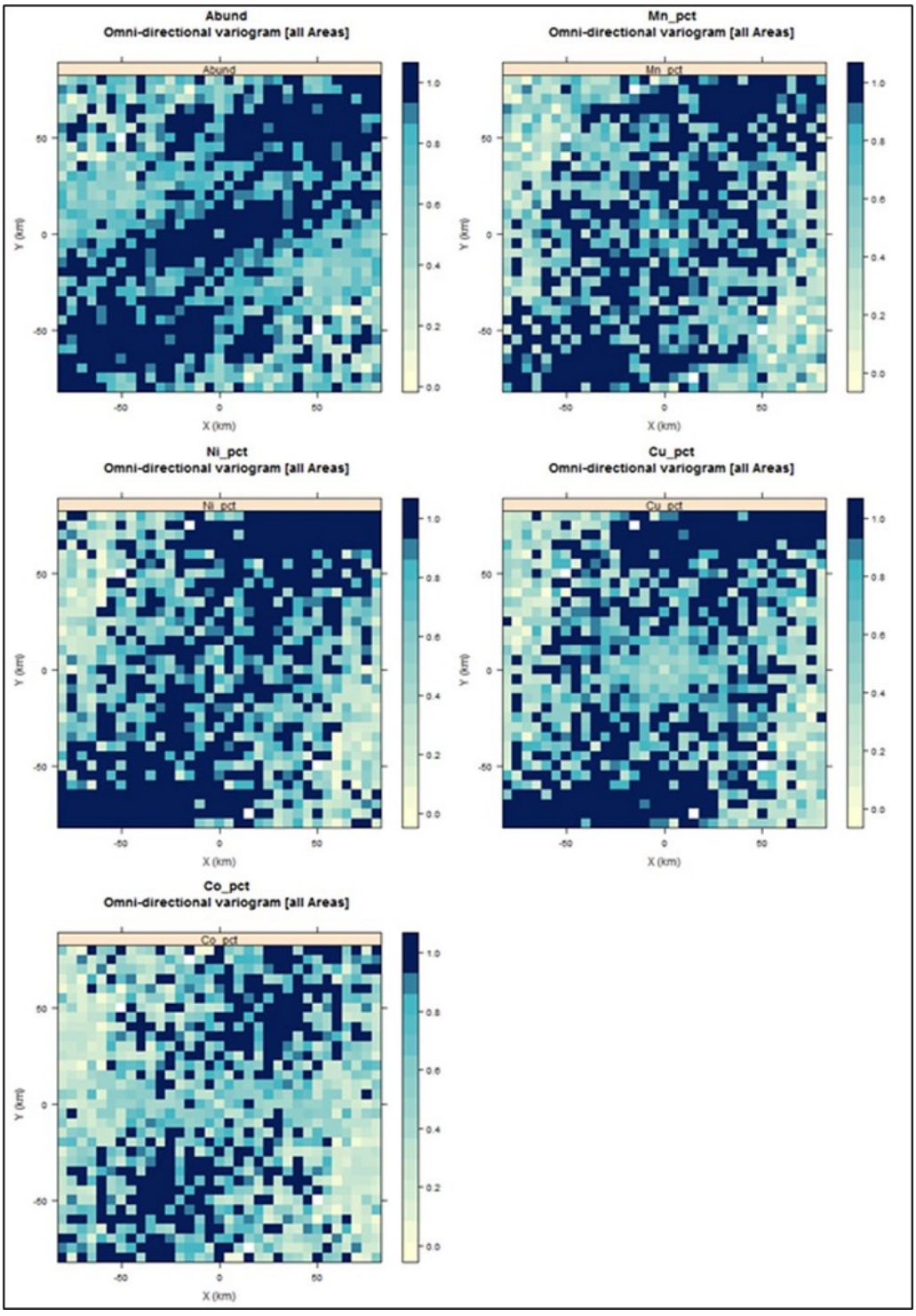


Figure 11.30 Semi-variogram maps for Abundance, Mn, Ni, Cu and Co



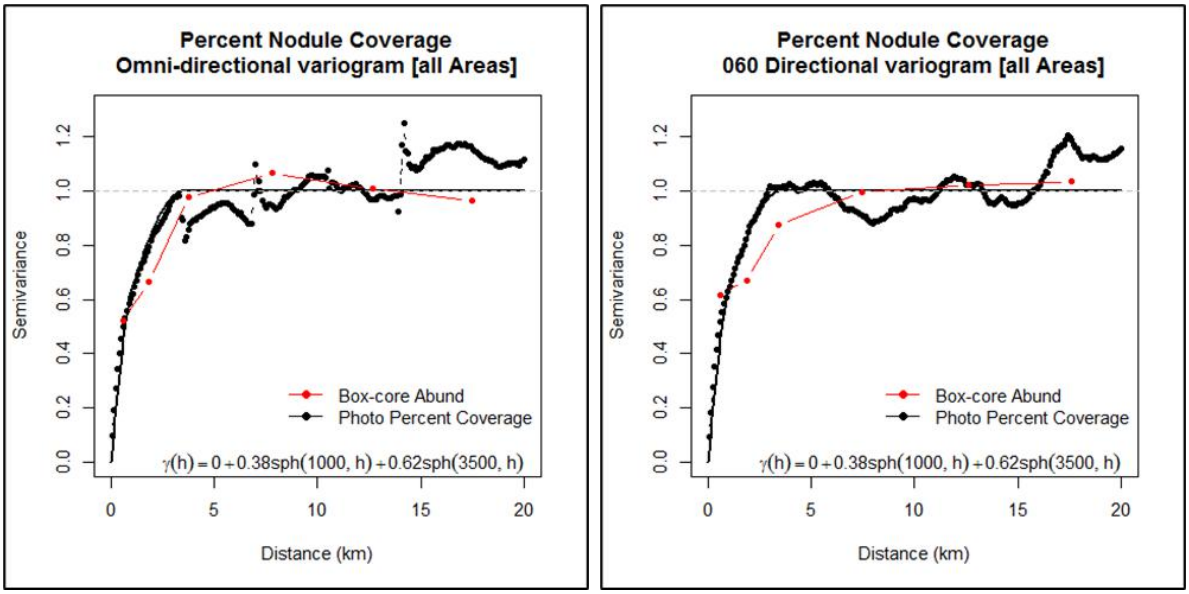
11.3.2 Variography of nodule coverage estimated from photo profiles

The continuity of nodule abundance as measured by the abundance variograms was checked by using the photo profile data.

The omni-directional and 060° directional variograms (Figure 11.31) for the percent nodule coverage estimated from the sea floor photos are similar to the box-core variograms. The range of percent nodule coverage is slightly shorter than the box-core samples. The large number of close spaced photos allows for a better estimate of the very short-range spatial variability and nugget. The percent nodule coverage semivariance starts at 0 (nugget) and quickly rises to the same semivariance value (between 0.5 and 0.6) as the first point on the box-core nodule abundance variogram. This suggests that the nugget for nodule abundance is close to 0 and that the first variogram structure has a sill of approximately 0.38 at a range of 1,000 m.

Also interesting is the periodic effect (hole effect) evident in the sill at ranges of approximately 7.5 km and 15 km which may be related to the spacing between the abyssal hills.

Figure 11.31 Omni-directional and 060° directional variograms for percent nodule coverage estimated from sea floor photos

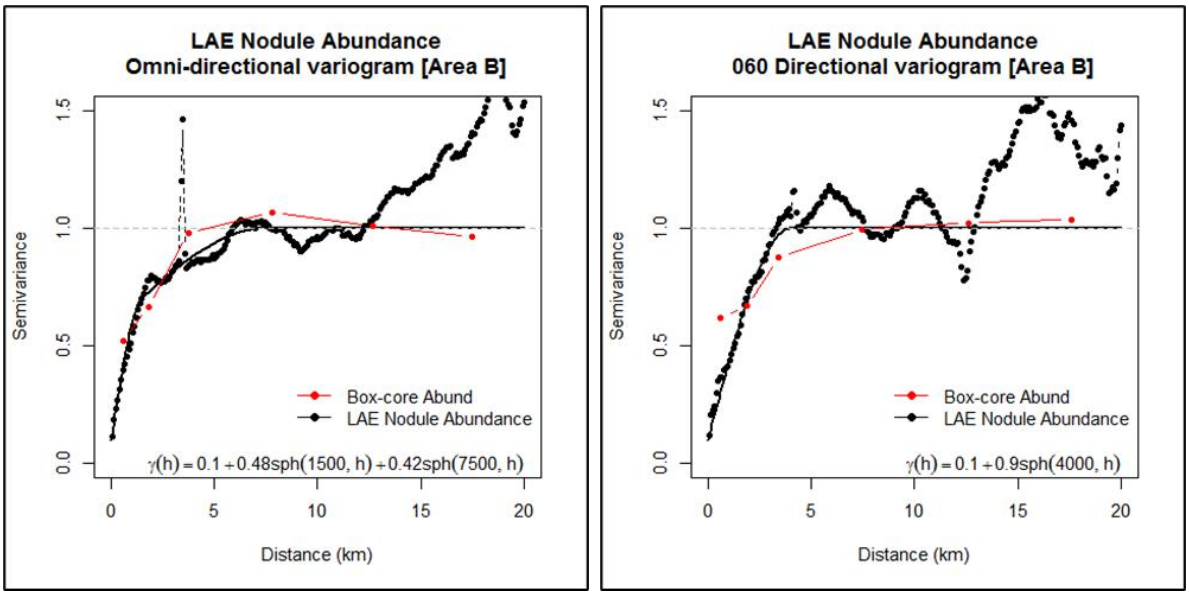


11.3.3 Variography of the estimated nodule abundance from the photo profile lines

The nodule abundance data automatically estimated from the seafloor photos using the LAE method were used to check the continuity of nodule abundance and compared with the variograms from the exploration sample data.

Compared with the nodule percent coverage variograms (Figure 11.31), the LAE nodule abundance omni-directional variograms show a slightly longer range of 7500 m. The same periodic effect (hole effect) evident in the percent nodule coverage variograms is also present in the 060° directional variogram while the omni-directional variogram hints at the presence of a long-range trend in the data. The omni-directional variogram is very similar to the nodule sample variogram but again shows a very low nugget variance.

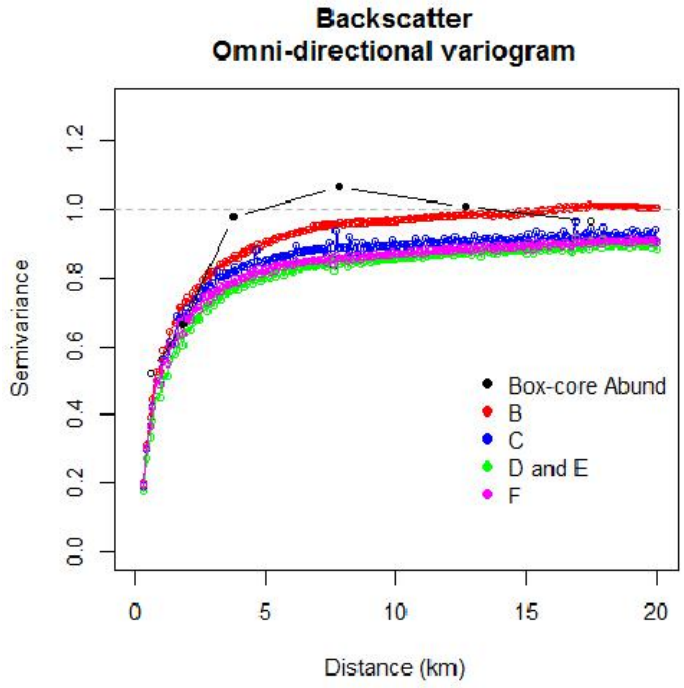
Figure 11.32 Omni-directional and 060° directional variograms for nodule abundance estimated using the LAE method from sea floor photos



11.3.4 Variography of the backscatter data

The backscatter data shows limited correlation with abundance but, in a broad sense, can be used to delineate zones of nodules from zones with very low to no nodules (the no nodule (NON) domain). Omni-directional variography (Figure 11.33) of the backscatter values indicate spatial variability that is consistent with the nodule sample data. The omni-directional variogram of the nodule sample data has a shorter range than the backscatter variograms but with similar very short range spatial variability. Interestingly Area B has the shortest range of the backscatter variograms and Area D and E have the longest.

Figure 11.33 Omni-directional variograms for backscatter values



11.4 Geological block model

Six block models were constructed, one for each TOML Exploration Area (A through to F). Each model was blocked according to the data spacing. Blocks of 1.75 km by 1.75 km were used to fill the areas tested by box core and photo profiles on a 3.5 km by 3.0 km grid (Measured Mineral Resource). Blocks of 3.5 km by 3.5 km were used to fill areas tested by box core sampling on a nominal spacing of approximately 7 km by 7 km (Indicated Mineral Resources), while the remainder were filled with blocks of 7.0 km by 7.0 km (Inferred Mineral Resources). Sub-cells with dimensions of 0.875 km by 0.875 km were used to accurately represent the boundaries of the TOML Exploration Areas, the areas interpreted to contain no nodules and the boundaries between Measured and Indicated.

The total area of the block model is 74 683 km^2 which is 99.96% of the actual total area of the TOML Licence Areas of 74 713 km^2 (Table 11.8). This indicates that the sub-blocks were adequate for approximating the licence boundaries.

Table 11.8 Comparison of model areas and actual licence areas

Area	Actual Area (m^2)	Model Area (m^2)	Percent Difference
A	10 280.560	10 309.141	0.278
B	9 966.266	9 950.062	–0.163
C	15 763.385	15 785.656	0.141
D and E	22 882.804	22 843.953	–0.170
F	15 819.900	15 794.078	–0.163
All	74 712.915	74 682.891	–0.04

11.5 Mineral Resource estimation

Ordinary Kriging (OK) was used to estimate Abundance, Mn, Ni, Cu and Co into the block model. Grades were estimated on a parent block basis using block discretisation of 5 by 5 by 1. Grades were also estimated using Nearest Neighbour (NN) and Inverse Distance (IDW) to the power of 2 for validation of the OK estimates. Blocks and sub-blocks within the NON domain were set to zero.

Three separate estimation passes were run, one for each parent cell size (Mineral Resource classification). The estimates for Measured and Indicated Mineral Resource used a search range of 30 km while for Indicated and Inferred a search range of 70km was used. A minimum of 1 and a maximum of 3 samples were allowed per octant search with a maximum of 8 samples per estimate.

The global Mineral Resource estimate is listed in Table 11.9 and the grade tonnage curves are shown in Figure 11.34. At abundance cut-offs of 7 kg/m^2 or less the tonnage and grade are relatively insensitive. Above 7 kg/m^2, global tonnage declines rapidly.

Figure 11.35 through to Figure 11.39 show sample locations on estimated block grades for Ni, Cu, Co, Mn and Abundance within the TOML Exploration Areas A to F. The figures indicate that for Ni, Cu, Co, Mn and Abundance there is continuity at ranges (40 to 80 km) several times greater than the average sample spacing. The patterns in distribution appear consistent between Ni, Cu, Co, and Mn reflecting the homogenous nature of the nodule chemistry across the TOML Exploration Area.

11.6 Cut-off grade

Due to the extremely low variance in the grades and the high metal content of the nodules, a conventional cut-off based on grades is not relevant to definition of the Mineral Resources. A cut-off based on abundance is a more effective basis for determining the limits of economic exploitation. A cut-off of 4 kg/m^2 abundance was chosen for the TOML Area, based on the estimates of costs and revenues presented in the Initial Assessment (IA) of the Mineral Resource contained in NORI Area D (AMC, 2021). The polymetallic nodule deposits in NORI Area D are similar to those in TOML Areas A through F and the QP considers that the proposed development of NORI Area D is a reasonable analogue for future development in the TOML Areas. Further details are presented in Section 11.9 of this report.

The method of calculation for the cut-off determined the minimum average nodule abundance needed during steady state operations such that the revenue minus costs (excluding capital) is greater than zero. Revenue includes metal pricing and metallurgical processing recoveries, and the costs include the collection, transport, processing, corporate costs, and royalties.

The metal prices assumed in the calculation of the cut-off were: nickel metal US$16,472/t; nickel in nickel sulphate US$18,807/t Ni; copper metal US$6,872/t; cobalt metal US$46,333/t; cobalt in cobalt sulphate US$56,920/t Co; manganese in manganese silicate US$4.50/dmtu. The price estimates are long term (2034–2046) forecasts provided in a report by CRU International Limited (CRU report, dated October 23, 2020). Section 16 summarizes the issues CRU considered in arriving at these price estimates. The QP considers that this timeframe is reasonable in view of the likely time required to bring the majority of the TOML Mineral Resources into production.

11.7 Mineral Resource classification

Classification of the Mineral Resource into Measured, Indicated and Inferred categories, in accordance with SEC Regulation S-K (subpart 1300), considered: the nodule sample quality, uncertainty in the nodule sample abundance and grades, continuity of nodule abundance and grade and scale of the deposit.

- Inferred Mineral Resource classification was based on sampling by Pioneer Contractors on a nominal spacing of 20 km, the variation and uncertainty in the sample quality, and the likely presence of short-range variation to nodule abundance.
- Indicated Mineral Resource classification was based on box core sampling by TOML on a nominal spacing of approximately 7 km by 7 km (including photo profiling in some cases at 7 km by 3 km), supplemented by sampling by Pioneer Contractors.
- Measured Mineral Resource was based on box core sampling by TOML on a nominal spacing of approximately 7 km by 7 km plus photo-profiling on a nominal spacing of 3.5 km by 3.0 km, supplemented by sampling by Pioneer Contractors.

Table 11.9 Mineral Resource estimate, in situ, for the TOML Exploration Area within the CCZ at a 4 kg/m^2 nodule abundance cut-off

TOML Area	Classification	Tonnes (x10^6 wet t)	Abundance (wet kg/m^2)	Ni (%)	Cu (%)	Co (%)	Mn (%)
A	Inferred	114	11.0	1.1	1.0	0.2	25.0
B	Measured	3	11.8	1.3	1.0	0.2	27.6
B	Indicated	14	11.1	1.3	1.1	0.2	28.6
B	Inferred	63	9.1	1.2	1.0	0.3	25.9
C	Indicated	15	8.6	1.3	1.2	0.2	30.5
C	Inferred	115	9.0	1.3	1.1	0.2	28.2
D	Indicated	29	12.2	1.3	1.2	0.2	30.1
D	Inferred	102	9.0	1.3	1.2	0.2	28.8
E	Inferred	58	10.6	1.3	1.1	0.2	28.7
F	Indicated	12	21.6	1.5	1.2	0.1	32.5
F	Inferred	244	16.6	1.4	1.2	0.1	32.2
Total	**Measured**	**2.6**	**11.8**	**1.3**	**1.0**	**0.2**	**27.6**
Total	**Indicated**	**69.6**	**11.8**	**1.3**	**1.2**	**0.2**	**30.3**
Total	**Inferred**	**696**	**11.3**	**1.3**	**1.1**	**0.2**	**29.0**

Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis, which is common practice for bulk commodities. Moisture content was estimated to be 28% w/w. These estimates are presented on an undiluted basis without adjustment for resource recovery.

Figure 11.34 Nodule Abundance – Tonnage Curve

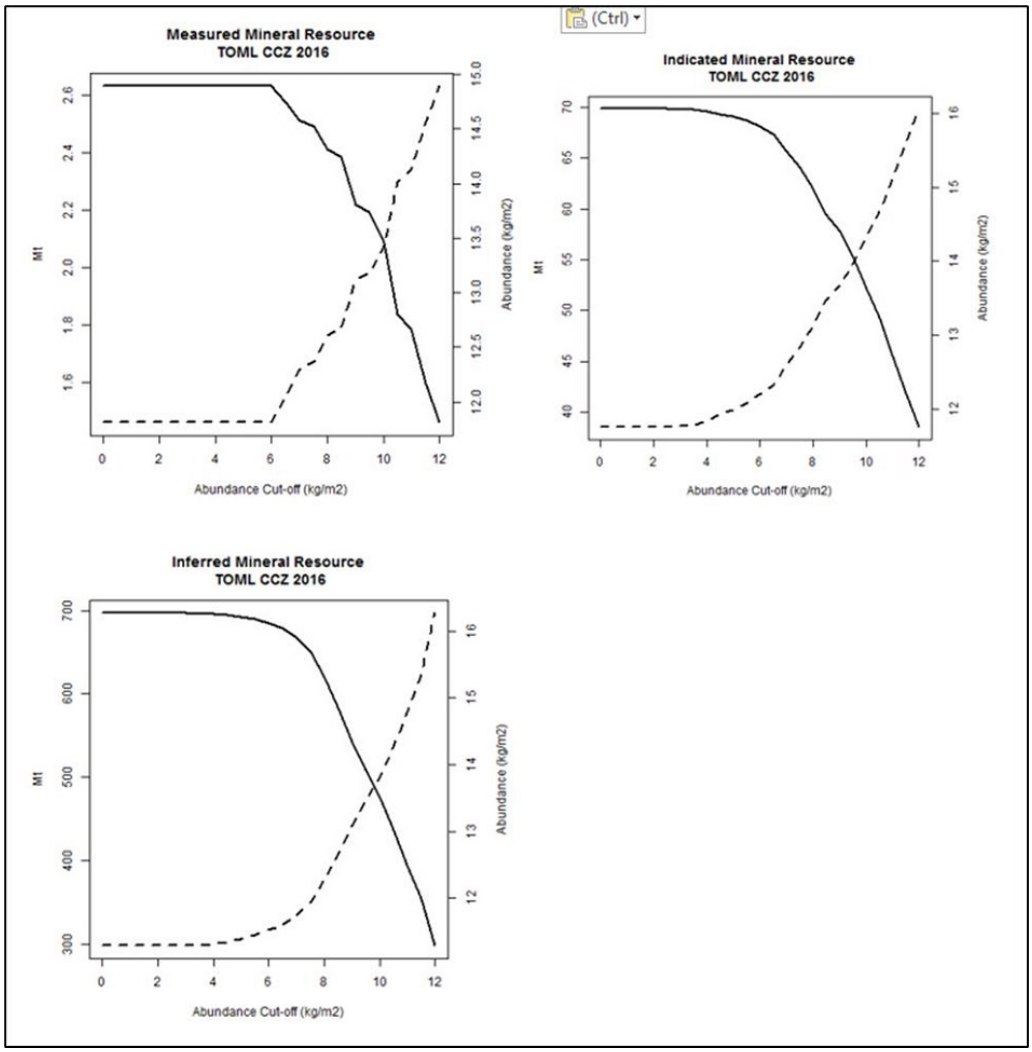


Figure 11.35 Map showing block model and sample distribution for Abundance Mn, Ni, Cu and Co in TOML Area A

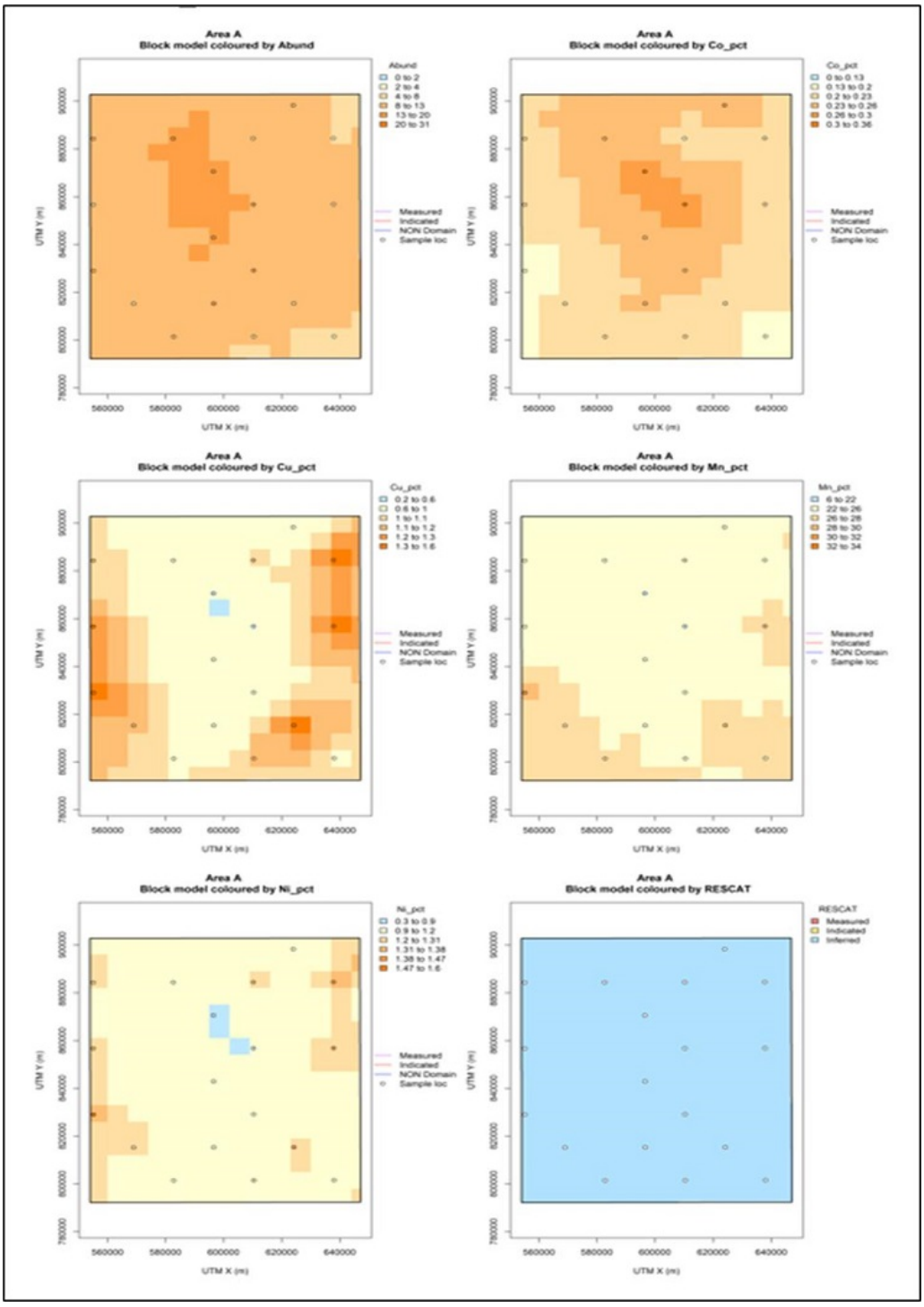


Figure 11.36 Map showing block model and sample distribution for Abundance Mn, Ni, Cu and Co in TOML Area B

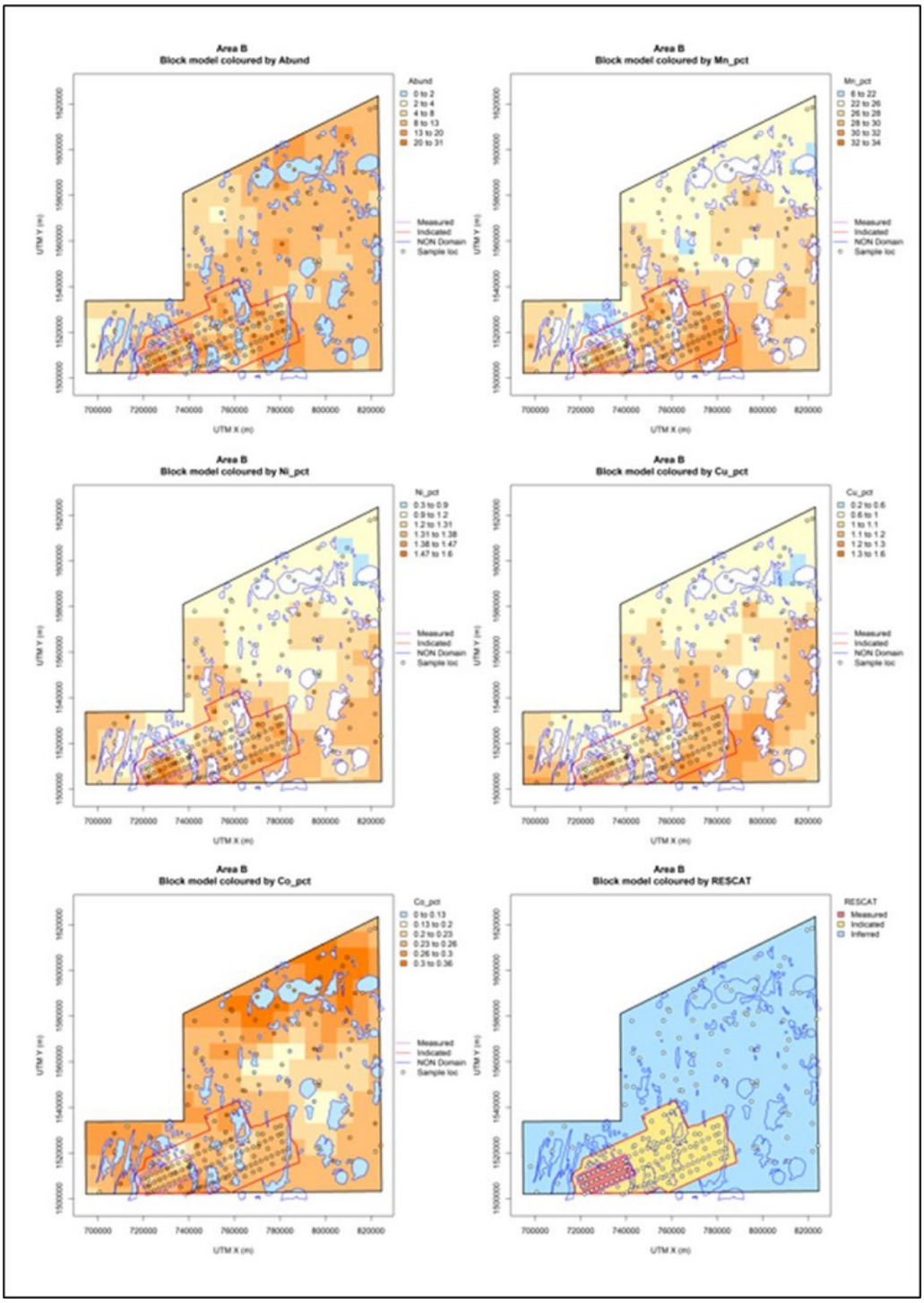


Figure 11.37 Map showing block model and sample distribution for Abundance Mn, Ni, Cu and Co in TOML Area C

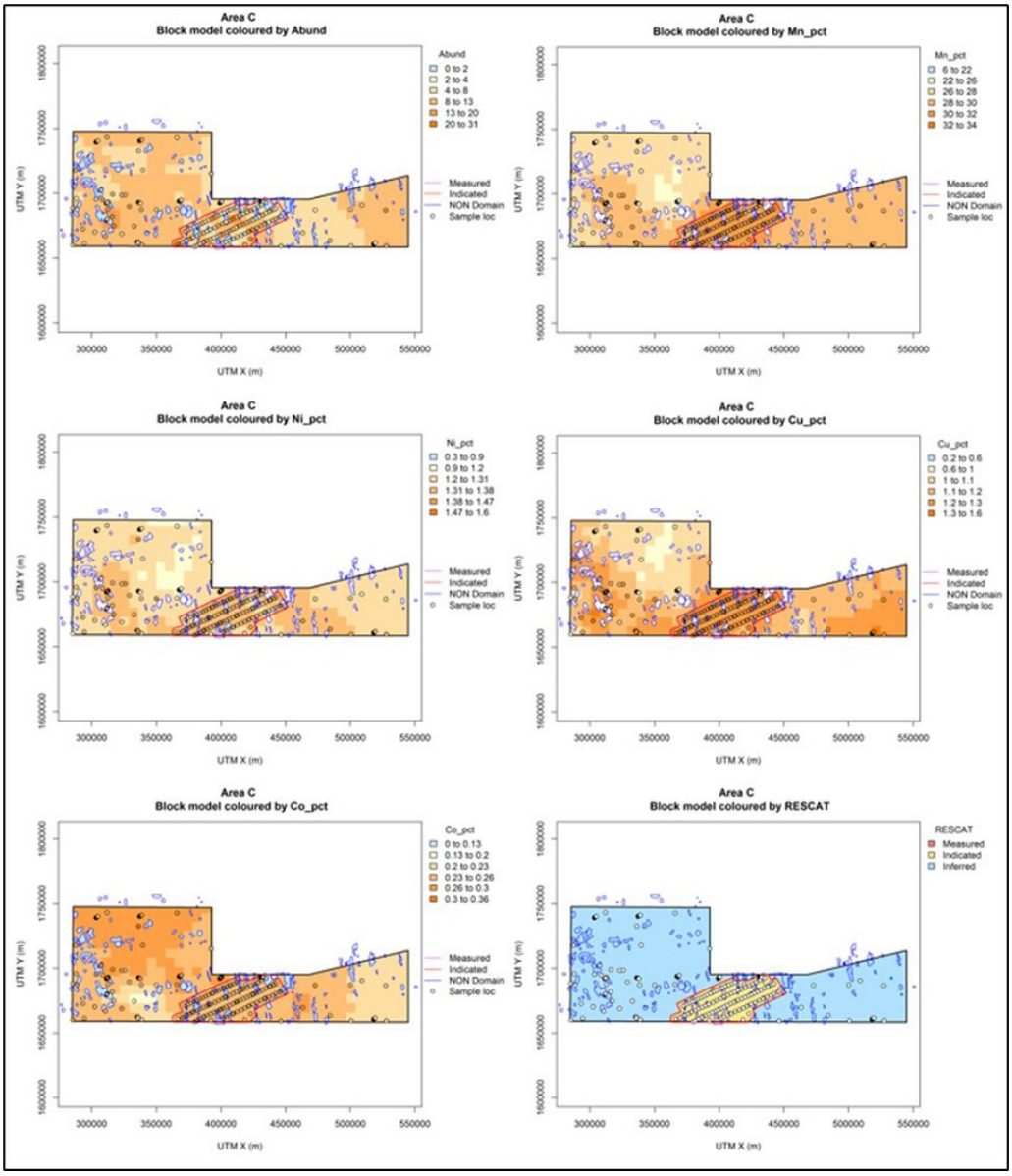


Figure 11.38 Map showing block model and sample distribution for Abundance Mn, Ni, Cu and Co in TOML Area D and Area E

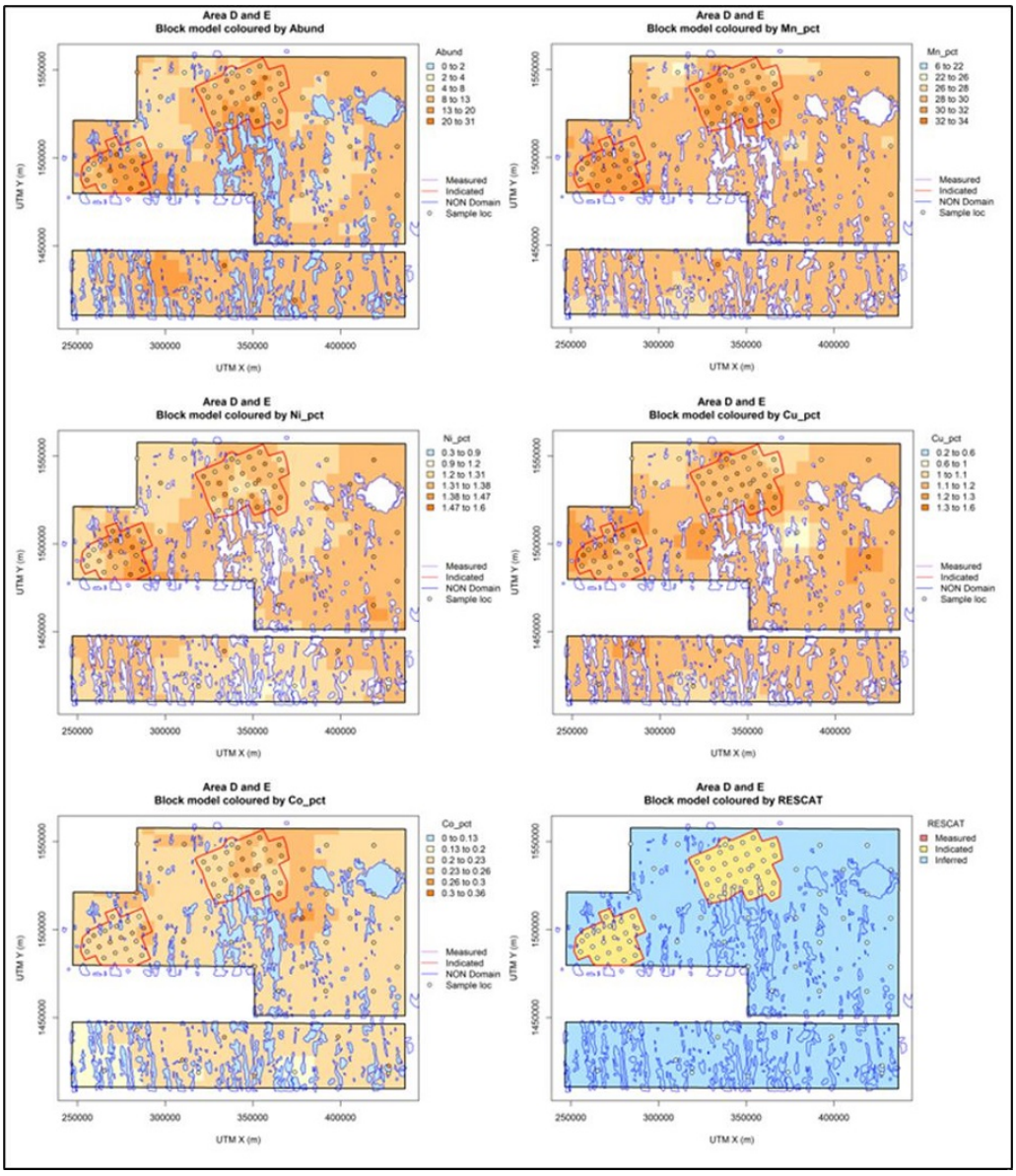
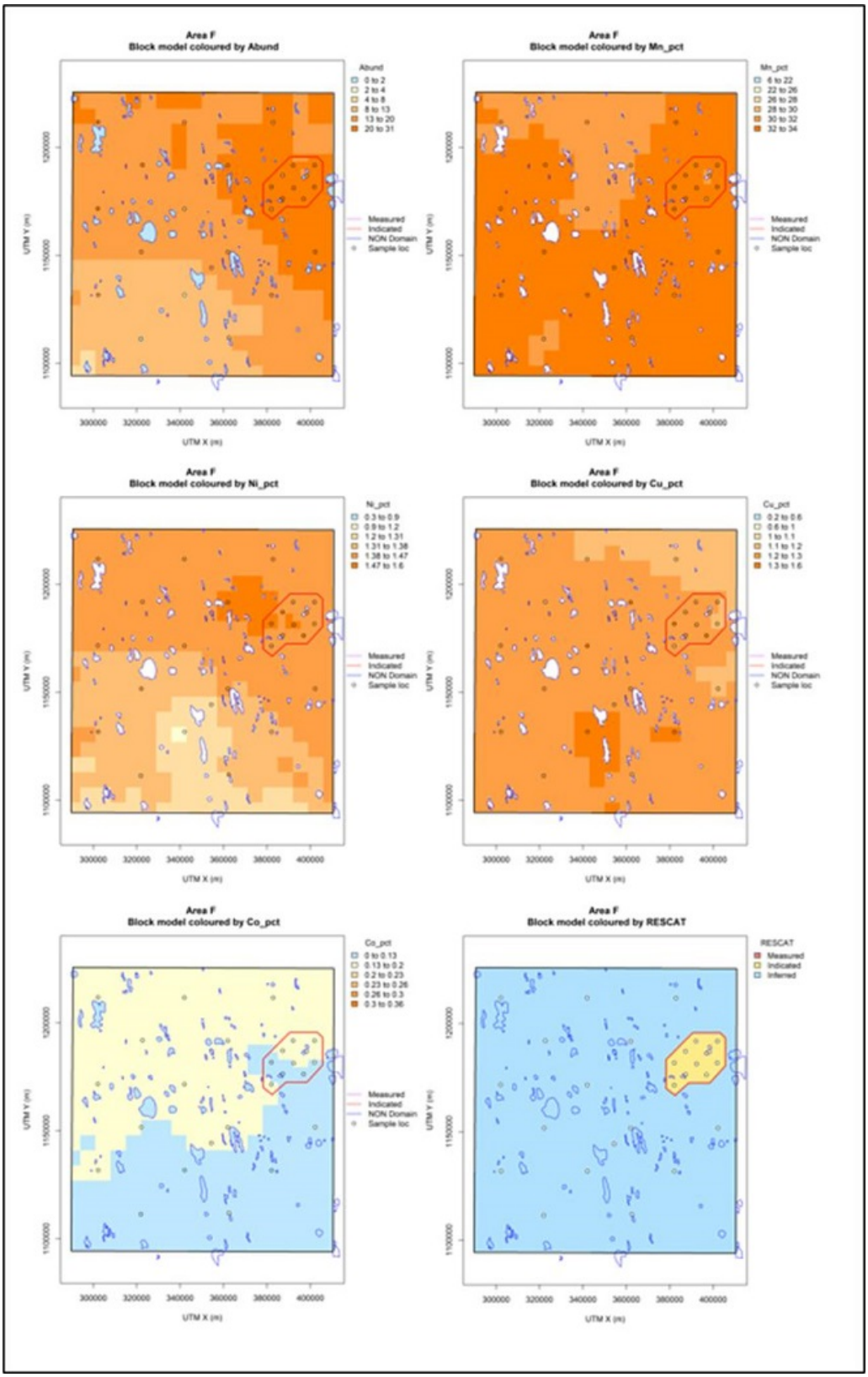


Figure 11.39 Map showing block model and sample distribution for Abundance Mn, Ni, Cu and Co in TOML Area F



The Mineral Resource model was validated by comparing the global mean and variance of the model against alternative nearest neighbour and inverse distance weighting estimates and the declustered samples. The comparative data for abundance, Mn, Ni, Cu and Co are presented in Table 11.10. The mean grades compare favourably and the expected variance reduction is observed, indicating that the estimate is satisfactory.

Table 11.10 Global mean and variance comparison (excluding NON domain, model cells weighted by volume)

		Declustered Samples (N=476 Abund) (N=315 Metals)	Model (N=14939)		
			NN	IDW	OK
Abundance (wet kg/m^2)	Mean	10.39	10.78	10.98	11.33
	Variance	38.19	36.29	26.86	16.56
Mn (%)	Mean	28.19	28.57	28.60	28.65
	Variance	9.652	9.100	7.895	6.887
Ni (%)	Mean	1.27	1.28	1.28	1.28
	Variance	0.028	0.024	0.018	0.018
Cu (%)	Mean	1.12	1.13	1.13	1.13
	Variance	0.043	0.037	0.028	0.020
Co (%)	Mean	0.220	0.210	0.210	0.210
	Variance	0.003	0.003	0.003	0.002

11.8 Comparison with previous Mineral Resource estimate

The initial global Inferred Mineral Resource for the TOML Exploration Areas was reported on 20 March 2013 by Golder Associates (Golder Associates, 2013). Table 11.11 shows the 2013 Mineral Resource estimate at a 4 kg/m^2 abundance cut-off.

The changes in the 2020 Mineral Resource estimate for the TOML CCZ Exploration Areas are due to:

- Inclusion of Areas E and F for the first time. High abundances and grades in Area F.
- Additional nodule abundance sample information (from box core and photo profile) collected during the 2015 Campaign.
- Setting the abundance estimates within the NON (no nodule) domain to zero in areas covered by MBES (TOML Areas B, C, D, E, F).
- Use of ordinary kriging (rather than inverse distance weighting) supported by short-range variogram to estimate abundance.
- Changes in block model parent cell size related to improved sample spacing.

The biggest change to the estimate is the inclusion of Areas E and F. In order to understand the impact of the other changes, the 2020 Mineral Resource estimate only for TOML Areas A to D, is shown in Table 11.12. The change from inverse distance weighting to ordinary kriging and the changes to block model parent cell size are unlikely to have any significant impact on the overall estimates. The differences between the 2013 and 2020 estimates for Area A to D are therefore likely to be mainly due to the additional sampling in 2015 and excising the NON domain from the estimates.

Comparison of Table 11.11 and Table 11.12 shows that the additional data has increased the total Mineral Resource tonnage by 3%. In the areas with the most new data (the Indicated and Measured areas), abundance and grades are all higher in the new model than the 2013 model. These changes show that it is reasonable to expect that the majority of Inferred Mineral Resources could be upgraded to Indicated or Measured Resources with further exploration.

Table 11.11 2013 Mineral Resource Estimate for the TOML Areas A to D at a 4 kg/m^2 abundance cut-off

Mineral Resource Classification	Tonnes (x10^6 wet t)	Abundance (wet kg/m^2)	Ni (%)	Cu (%)	Co (%)	Mn (%)
Inferred	440	8.9	1.2	1.1	0.24	26.9

Table 11.12 Current (2020) Mineral Resource Estimate for the TOML Areas A-D at a 4 kg/m^2 abundance cut-off

Mineral Resource Classification	Tonnes (x10^6 wet t)	Abundance (wet kg/m^2)	Ni (%)	Cu (%)	Co (%)	Mn (%)
Measured	2.6	11.8	1.33	1.05	0.23	27.6
Indicated	57.5	11.0	1.33	1.17	0.23	29.8
Measured + Indicated	60.1	11.1	1.33	1.16	0.23	29.7
Inferred	393.6	9.6	1.22	1.07	0.24	27.1

Additional more-detailed comparisons of the data available in 2013 and the data gathered by TOML in 2015 are provided in Table 11.13 to Table 11.18.

Table 11.13 Mean Abundance of historical and 2015 campaign nodule samples (including NON domain)

Sub-Area	Historical Abundance (wet kg/m^2)		2015 Abundance (wet kg/m^2)		All Abundance (wet kg/m^2)	
	N	Mean	N	Mean	N	Mean
B1	16	8.91	105	9.93	121	9.79
C1	11	11.26	102	7.41	113	7.78
D1	4	7.12	16	13.84	20	12.49
D2	6	9.42	26	11.59	32	11.19
F1	–	–	10	21.65	10	21.65

Table 11.14 Mean Abundance of historical and 2015 campaign nodule samples (excluding NON domain)

Sub-Area	Historical Abundance (wet kg/m^2)		2015 Abundance (wet kg/m^2)		All Abundance (wet kg/m^2)	
	N	Mean	N	Mean	N	Mean
B1	15	8.88	89	11.45	104	11.08
C1	11	11.26	92	8.08	103	8.42
D1	4	7.12	16	13.84	20	12.49
D2	5	9.21	25	12.05	30	11.58
F1	–	–	10	21.65	10	21.65

Table 11.15 Mean Ni grades of historical and 2015 campaign nodule samples (excluding NON domain).

Sub-Area	Historic % Ni		2015 % Ni		All % Ni	
	N	Mean	N	Mean	N	Mean
B1	14	1.31	23	1.32	37	1.31
C1	11	1.31	13	1.33	24	1.32
D1	3	1.31	14	1.36	17	1.35
D2	5	1.34	24	1.33	29	1.33
F1	–	–	10	1.46	14	1.38

Table 11.16 Mean Cu grades of historical and 2015 campaign nodule samples (excluding NON domain).

Sub-Area	Historic % Ni		2015 % Ni		All % Ni	
	N	Mean	N	Mean	N	Mean
B1	15	1.07	23	1.09	37	1.08
C1	11	1.23	13	1.24	24	1.24
D1	4	1.20	14	1.19	17	1.19
D2	5	1.15	24	1.17	29	1.17
F1	–	–	10	1.23	14	1.25

Table 11.17 Mean Co grades of historical and 2015 campaign nodule samples (excluding NON domain).

Sub-Area	Historic % Ni		2015 % Ni		All % Ni	
	N	Mean	N	Mean	N	Mean
B1	15	0.240	23	0.238	37	0.239
C1	11	0.248	13	0.243	24	0.245
D1	4	0.210	14	0.221	17	0.219
D2	5	0.232	24	0.224	29	0.226
F1	–	–	10	0.131	14	0.133

Table 11.18 Mean Mn grades of historical and 2015 campaign nodule samples (excluding NON domain).

Sub-Area	Historic % Ni		2015 % Ni		All % Ni	
	N	Mean	N	Mean	N	Mean
B1	15	28.0	23	28.6	37	28.4
C1	11	29.4	13	31.1	24	30.3
D1	4	29.3	14	30.5	17	30.3
D2	5	28.0	24	30.3	29	29.9
F1	–	–	10	32.5	14	32.1

11.9 Initial Assessment

The TOML Mineral Resource estimates are supported by an Initial Assessment carried out on behalf of DeepGreen for the NORI Property (AMC, 2021). The polymetallic nodule deposits in NORI Area D are similar to those in TOML Areas A through F and the QP considers that the proposed development of NORI Area D is a reasonable analogue for future development in the TOML Areas. The NORI Property IA is directly relevant and applicable to the TOML Property for the reasons set out below.

11.9.1 Geological setting and mineralisation

The TOML area and the NORI Property occur within the vast polymetallic nodule field in the Clarion Clipperton Zone of the Pacific Ocean. This mineral field is essentially a single mineral deposit almost 5,000 km in length and up to 600 km wide. The size and level of uniformity of mineralization is unmatched by any mineral deposit of similar value on land. The mechanism of formation of the nodules is interpreted to be essentially identical across the entire CCZ, with only minor local variations. Consequently, there is relatively little difference between the size, shape or metal content of the nodules from one area to another. Figure 6.9 to Figure 6.11 illustrate the remarkable continuity of grades and abundances across the whole of the CCZ.

The morphological features of the seafloor are similar in the TOML and the NORI Areas, which all lie within the Abyssal Plains and are characterized by sub-parallel basaltic lava ridges called abyssal hills. The Areas are punctuated by typically extinct volcanic knolls and seamounts and scattered sediment drifts in which few nodules are preserved at the seafloor.

Figure 11.40 compares nodule shapes, nodule abundance on the seafloor and backscatter imagery from TOML and NORI Areas.

11.9.2 Exploration methods

The exploration methods used to explore and delineate the Mineral Resources in the TOML and NORI areas were essentially the same. MBES was used to determine the depth of water (bathymetry) and the acoustic reflectance (backscatter) of the seabed. Nodule coverage was interpreted using the backscatter data. Physical sampling of the nodules was carried out initially using FFG samplers and in more recent years by BC samplers which provide a better-quality sample. Measurements of nodule abundance obtained from physical samples were supplemented with estimates of abundance made using the LAE method and high-resolution photographs of the seafloor.

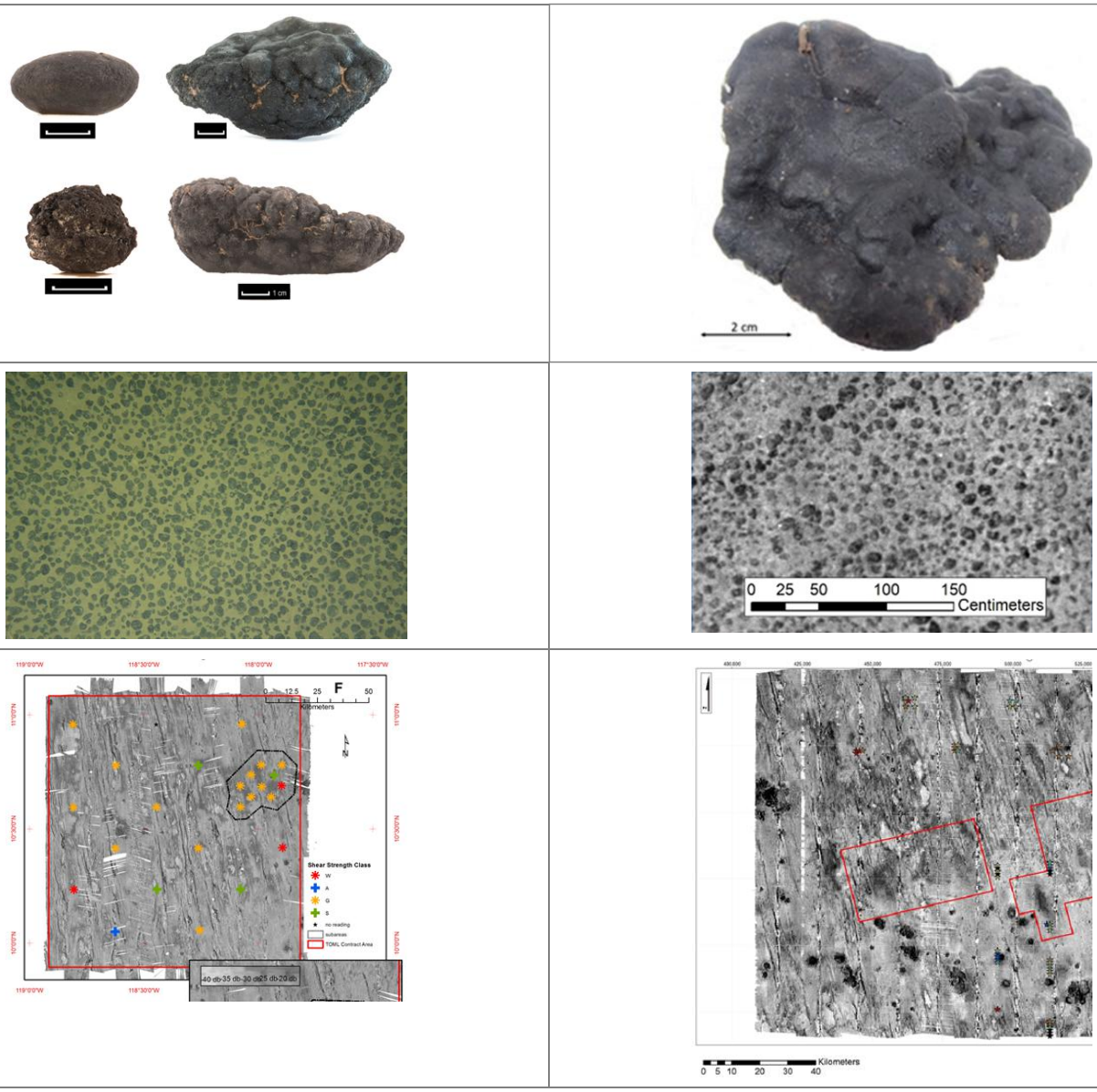
11.9.3 Sample preparation analysis and security

The sample preparation and assaying procedures used in the TOML and NORI areas were essentially the same. The Pioneer Investor data lacks some supporting information but all studies to date indicate that the Pioneer Investor data is reliable. In both Areas, high standards of QAQC were applied to the exploration programmes that were carried out by TOML and NORI. The assay data are supported by the results of certified reference materials, duplicate samples, blank samples, and duplicate analyses at a second laboratory. Sample security was of a high standard and the QPs consider that there was negligible risk of interference with the samples.

11.9.4 Mineral Resources

The Mineral Resources in the TOML and NORI areas were estimated using similar methods. Although the average abundances in the TOML Areas are lower than in NORI Area D, they are still well above the 4 kg/m^2 abundance cut-off derived in the IA. Furthermore, as discussed in Sections 7.1.2 and 11.8, the FFG samples tend to underestimate abundance and it is likely that, as the FFG data is progressively replaced with BC data, the estimated abundances in the Mineral Resource will increase.

Figure 11.40 Comparison of nodule shapes, nodule abundance and backscatter imagery from TOML Areas (left and NORI Areas (right)



11.9.5 Mining methods

The commonality between the polymetallic nodule deposits in NORI Area D and the TOML Areas indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. The Technical Report Summary for NORI Area D assessed the following mining development scenario:

"The main items of off-shore infrastructure are the nodule collector vehicles, the riser, and… production support vessels (PSV).

The nodules will be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection. The collectors will be remotely controlled and supplied with electric power via umbilical cables from the PSV. Suction dredge heads on each collector will recover a dilute slurry of nodules, sediment, and water from the seafloor. A hopper on each vehicle will separate sediment and excess water, which will pass out of the hopper overflow, from the nodules, which will be pumped as a higher concentration slurry via flexible hoses to a riser.

The riser is a steel pipe through which nodules will be transferred to the surface by means of an airlift. The riser will consist of three main sections. The lower section will carry the two-phase slurry of nodules and water from the collectors to the airlift injection point. The mid-section will carry a three-phase mixture of slurry and air. This section will also include two auxiliary pipes: one to carry the compressed air for the airlift system, and one to return water from dewatering of the slurry to its subsea discharge point. The upper section of riser will have a larger diameter to account for the expansion of air in the airlift.

The airlift works by lowering the average density of the slurry inside the riser to a level lower than seawater. The difference between the hydrostatic pressure of the seawater at depth and the pressure caused by the weight of the low-density three-phase slurry column inside the riser forces the slurry column to rise. The energy to achieve the lift will be supplied by compressors housed on the PSV, which will be capable of generating very high air pressures.

The PSVs will each support a riser and lift system (RALS) and its handling equipment, and will house the airlift compressors, collector vehicle control stations, and material handling equipment. All power for off-shore equipment, including the nodule collecting vehicles, will be generated on the PSVs. The PSVs will be equipped with controllable thrusters and will be capable of dynamic positioning (DP), which will allow the vessels and risers to track the collectors. Nodules will be discharged from the RALS to the PSVs, where they will be dewatered and temporarily stored or transferred directly to a transport vessel."

The QP considers that this IA supports the view that there are reasonable prospects of economic extraction of polymetallic nodule Mineral Resources in the TOML Areas.

11.9.6 Mineral Processing and metallurgical testing

The polymetallic nodules in the TOML and NORI Areas have similar morphological, mineralogical, and grade characteristics. As noted in Section 10, all published historical work indicates that processing of nodules is technically feasible.

The commonality between the polymetallic nodule deposits in NORI Area D and TOML Areas indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. The Technical Report Summary for NORI Area D (AMC, 2021) assessed the following mineral processing scenario:

"The first part of the pyrometallurgical process is the Rotary Kiln Electric Furnace (RKEF) process that is widely used in the nickel laterite industry. The second pyrometallurgical step (sulphidisation of the alloy produced in the first step to form a matte and then partially conversion in a Peirce-Smith converter to remove iron), while not widely practiced, also has commercial precedent at the Doniambo plant of Societe Le Nickel in New Caledonia.

Sulphuric acid leaching of matte from the pyrometallurgical process has precedent in the platinum group minerals (PGM) industry. Although copper producers typically have a solvent extraction step before electrowinning of their copper, direct copper electrowinning is done in most PGM refineries, where nickel and cobalt are also significant pay-metals. This is to maximise nickel recovery and minimise operating expenses. The nickel and cobalt are purified using solvent extraction, ion exchange and precipitation, which are all commercially proven hydrometallurgical processes. Battery grade nickel and cobalt sulphate are then crystallised from the purified solutions.

The pyrometallurgical process forms two by-products as well as the matte for the hydrometallurgical refinery:

- *Electric furnace slag containing silica and 53% MnO that is intended to be sold as feed to the Si-Mn industry.*
- *A converter aisle slag that could be used for aggregate in road construction or other applications.*

The hydrometallurgical refinery generates iron residues that would, for a stand-alone plant, require disposal. However, these streams can be recycled back to the pyrometallurgical plant for re-treatment and recovery of entrained pay metals.

Selection of ammonia as a principal reagent in the hydrometallurgical refinery means that an additional by-product—ammonium sulphate—is generated. This could be sold into the fertiliser industry.

The copper cathode quality from direct electrowinning, without a solvent extraction step, is expected to be ≥99.9% Cu. Quality of the matte produced in the pyrometallurgical plant will have an impact on this, including the potential carryover of impurities beyond values assumed for the purpose of the IA.

The production of battery-grade nickel and cobalt sulphates is targeted instead of nickel or cobalt cathodes or other intermediate products.

In summary:

- *All parts of the proposed process have commercial precedents in similar or analogous industries, however not as a whole continuous flowsheet.*
- *Pay-metals are recovered in the following forms:*
  - *Copper cathodes with an expected quality of ≥99.9% Cu.*
  - *Battery-grade nickel sulphate.*
  - *Battery-grade cobalt sulphate.*
- *Rather than generating large waste streams, the process produces by-products including high manganese content furnace slag and ammonium sulphate.*

The process assumptions used in this study will need to be verified as the project proceeds."

The QP considers that this IA supports the view that there are reasonable prospects of economic extraction of polymetallic nodule Mineral Resources in the TOML Areas.

11.9.7 Infrastructure

The infrastructure requirements for the development of commercial production in the TOML Areas, apart from the minerals processing facility, will be modest compared to terrestrial resources projects of similar production capacities.

The site and host country for the minerals processing facility has not yet been confirmed. The site must be serviced by grid power, reticulated water, and natural gas. A location will be selected that is close to an industrial port, and near an existing municipality from which labour can be sourced.

As part of the IA for the NORI Area D Project, a preliminary assessment of the transportation fleet for transfer of nodules from the CCZ to an existing deep-water industrial port equipped with bulk offloading facilities was examined (AMC, 2021). The IA assumed that chartered vessels would be used to transport the dewatered nodules to the port of Lazaro Cardenas, Michoacan, Mexico, 960 nm from the NORI Area D reference site. The vessels would be converted bulk mineral carriers with dynamic positioning (DP) to allow tracking behind the production support vessels during operations. The method of offloading, known as tandem offloading, is well established for offloading of oil production vessels in remote areas of the world.

There are no physical or logistical barriers between the TOML and NORI Areas. Their location may simply influence shipping costs.

The QP considers that establishing on-shore infrastructure and transportation of nodules from the TOML Areas to suitable ports are unlikely to be impediments to commercial production from the TOML Areas.

11.9.8 Market studies

AMC has considered the market for the nickel, copper, cobalt and manganese products that might be recovered from the polymetallic nodules in the TOML Areas.

CRU International Limited (CRU) was commissioned by NORI to provide market overviews for the four main products from the NORI Area D Project: nickel sulphate ($NiSO_4$), cobalt sulphate ($CoSO_4$), copper, and a manganese product (CRU, 2020).

CRU expects $NiSO_4$ and $CoSO_4$ markets to undergo extreme growth from a relatively small current level of 181 kt nickel in sulphate and 35 kt of cobalt in sulphate in 2019, with markets to increase to 138 and 178 times their 2018 sizes respectively to 1.6 Mt nickel in sulphate and 500kt cobalt in sulphate by 2035, with much of this growth occurring post-2025. Electric vehicle production is the driver of this forecast growth.

Copper and manganese markets are forecast to grow by 25% and 20% of their 2020 sizes by 2035 respectively. Copper and manganese demand will benefit from electric vehicle penetration, however the primary driver of growth for manganese ore will be steelmaking, and a variety of end use applications generally related to economic health for copper.

CRU expects copper and $NiSO_4$ prices to rise in real terms by 2035, while manganese ore and $CoSO_4$ prices are forecast to remain flat, due to current prices being at or near a high point in the cycle, recent fall in prices, and expected modest growth in the global steel industry after the COVID 19 epidemic. The long-term cost of production is expected to rise for both copper and $NiSO_4$, helping to support prices.

11.9.9 Environmental compliance and permitting

The ISA is mandated through UNCLOS to organize, regulate, and control all mineral related activities in the international seabed Area whilst preserving and protecting the marine environment. As the TOML Areas are in the international seabed Area, the ISA is responsible for assessing any Environmental and Social Impact Assessment prepared by TOML and for granting the relevant contracts. Further details are provided in Section 17.

Between 1998 and 2014, the ISA held workshops and developed a number of documents to provide guidance to contractors with respect to its expectations for responsible environmental management during the exploration and exploitation phases of mineral development. The ISA held a workshop “Towards an ISA environmental management strategy for the Area” over 20-24 March 2017 in Berlin Germany. The results of the workshop were published as ISA Technical Study 17 (ISA 2017).

The ISA has issued Regulations on Prospecting and Exploration for Polymetallic Nodules (adopted on 13 July 2000, updated on 25 July 2013). The regulations were complemented by the Legal and Technical Commission (LTC) recommendations for the guidance of contractors on assessing the environmental impacts of exploration (ISBA/25/LTC/6/Rev.1) which was most recently updated on 30 March, 2020. The draft exploitation regulations on deep-seabed mining were discussed at the 25th Session of the ISA (25 February to 1 March 2019 in Kingston Jamaica). The ISA had declared a target of 2020 to have the regulations approved but the COVID-19 pandemic disrupted the ISA program.

Although the environmental impact review process has not yet been finalised, the draft regulations outline the application process and the conditions that Contractors would need to implement during operations. All contractors have been made aware that the ISA requires the completion of the Environmental and Social Impact Assessment (ESIA) studies, culminating in an Environmental Impact Statement (EIS), in support of their applications for an exploitation license. Guidance for contractors in terms of what will be expected in the EIS has been provided in ISA Technical Study No. 10 (ISA 2012a). Further guidance will be provided with the completion of Standards and Guidelines for exploitation activities. The LTC has prioritized the development of six Standards and Guidelines, with three released for public comment in 2020 and the remaining three expected to be released in early 2021. The EIS, along with an Environmental Management System with subordinate Environmental Management and Monitoring Plans (EMMP), will be required as part of the application for an exploitation license within the Contract Area.

The environmental permitting process for the Area has been developed through a consultation program initiated by the ISA in 2013 and includes feedback obtained from multiple stakeholder groups. It is expected to involve a series of checks and balances, with reviews being conducted by the LTC with input from independent experts, as required. The recommendations of the LTC will then go before the ISA Council, which will then review the information provided and decide whether to approve the license application and, if so, what conditions should be applied.

The LTC has recommended seven key areas of information for the development of EIAs. These are physical oceanography, chemical oceanography, sediment properties, biological communities, bioturbation, sedimentation, and geological properties. These will form the key investigation topics for surveys within the Area, including the TOML Areas.

The social impacts of the off-shore operation are expected to be positive. The CCZ is uninhabited by people, and there are no landowners associated with the TOML Areas. No significant commercial fishing is carried out in the area. The Project will provide a source of revenue to the sponsor country, Tonga, and to the ISA.

The on-shore environmental and social impacts have not yet been assessed because the process plant has not been designed in detail, and the location and host country (and hence regulatory regime) not confirmed.

As sponsoring state, Tonga has a responsibility to ensure that TOML’s activities in the international seabed area are carried out in conformity with Part XI of UNCLOS.

Under ISA requirements contractors are required to submit five-year work programs. The first TOML five-year work program was completed in 2016 and reviewed and accepted by the ISA in late 2016.

For the second five-year period ending in 2022 TOML proposed the following program.

- Continue environmental baseline work;
- Complete pilot testing;
- Complete geotechnical studies;
- Complete feasibility studies;

- First draft EIA/EMP;
- Continue training.

TOML noted that the program was:

- Dependent on success at each stage;
- Subject to change based on findings at hand at any particular time; and
- Reliant on funding which in turn is dependent to some extent on macro-economic conditions and development with regards to the Authority and its stakeholders.

As a result of the financial state of the company, TOML did not progress at the rate intended until TOML was purchased by DeepGreen in March 2020. TOML currently plans an aggressive program of offshore campaigns in 2021–2023 focussing on resource assessment and environmental base line studies with the objective of upgrading the TOML F resource area to Indicated Mineral Resource status and completing environmental baseline studies and ESIA for the TOML F resource area.

12 Mineral Reserve Estimates

There are no Mineral Reserve estimates for the TOML Exploration Area of the CCZ and the potential viability of the Mineral Resources has not yet been supported by a pre-feasibility study or a feasibility study.

13 Mining Methods

Mining methods that could be employed for commercial development of polymetallic nodule deposits in the CCZ were studied in an IA for NORI Area D (AMC, 2021). The commonality between the polymetallic nodule deposits in NORI Area D and TOML Areas indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. This is discussed further in Section 11.9.

There are no Mineral Reserve estimates for the TOML Exploration Area of the CCZ and the potential viability of the Mineral Resources has not yet been supported by a pre-feasibility study or a feasibility study.

14 Recovery Methods

Recovery methods that could be employed for commercial development of polymetallic nodule deposits in the CCZ were studied in an IA for NORI Area D (AMC, 2021). The commonality between the polymetallic nodule deposits in NORI Area D and TOML Areas indicates that the methods proposed for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. This is discussed further in Section 11.9.

There are no Mineral Reserve estimates for the TOML Exploration Area of the CCZ and the potential viability of the Mineral Resources has not yet been supported by a pre-feasibility study or a feasibility study.

15 Project Infrastructure

The project infrastructure that would be required for commercial development of polymetallic nodule deposits in the CCZ was studied in an IA for NORI Area D (AMC, 2021). The commonality between the polymetallic nodule deposits in NORI Area D and TOML Areas indicates that the requirements for the development of NORI Area D can reasonably be assumed to be equally relevant for future development in the TOML Areas. This is discussed further in Section 11.9.

There are no Mineral Reserve estimates for the TOML Exploration Area of the CCZ and the potential viability of the Mineral Resources has not yet been supported by a pre-feasibility study or a feasibility study.

16 Market Studies and Contracts

For initial assessment of the prospects for economic extraction of the Mineral Resource, AMC has considered the market for the nickel, copper, cobalt and manganese products that might be recovered from the polymetallic nodules in the TOML Areas.

CRU International Limited (CRU) was commissioned by NORI to provide market overviews for the four main products from the NORI Area D Project: nickel sulphate ($NiSO_4$), cobalt sulphate ($CoSO_4$), copper, and a manganese product (CRU report dated October 23, 2020).

Over a five year horizon, CRU's price forecasts are based primarily on supply and demand fundamentals. These are established from CRU's detailed bottom-up analysis of supply by individual mine and finished product producer, and in-depth analysis of demand from individual applications. CRU also considers operating costs and inventories in its forecasts, as well as various other factors where relevant.

For the forecast beyond a five year horizon, cyclical supply-demand balances become hard to predict. Therefore, CRU's longer term price forecasts are based on the Long Run Marginal Cost (LRMC) concept. That is, that prices in the long term will trend towards, and fluctuate around, the full economic costs (i.e., operating costs including an allowance for a return on capital) of the marginal tonne required to meet long term demand. For example, when prices are above the LRMC, CRU would assume that supply would be added and prices would subside. Assets selected for the LRMC analysis are a representative sample that are likely to be in production to satisfy future demand. CRU uses its Project Gateway classification system to select projects. It is important to consider where these new assets will be located, how large they will be and what processing technology they will adapt. The composition of future capacity and accompanying demand levels will have a significant impact not just on the LRMC assessment, but also the upside and downside risk associated with that assessment.

One exception to this long term price forecasting methodology is the cobalt market. Since the majority of cobalt is produced as a by-product of copper or nickel mining, supply is inelastic to the cobalt price, with supply decisions instead more likely to be driven by the market environment for the operations' main copper or nickel product. This means that the Long Run Marginal Cost concept cannot readily be applied. Instead, CRU refers to historic pricing trends to establish a long term equilibrium price, taking into account longer term factors, such as the increasing importance of batteries as a cobalt end use, that might result in cobalt prices and product premia differing with historical trends.

Taking into account the foregoing assumptions and analysis, CRU expects $NiSO_4$ and $CoSO_4$ markets to undergo extreme growth from a relatively small current level of 181 kt nickel in sulphate and 35 kt of cobalt in sulphate in 2019, with markets to increase to 138 and 178 times their 2018 sizes respectively to 1.6 Mt nickel in sulphate and 500kt cobalt in sulphate by 2035, with much of this growth occurring post-2025. Electric vehicle production is the driver of this forecast growth.

Copper and manganese markets are forecast to grow by 25% and 20% of their 2020 sizes by 2035 respectively. Copper and manganese demand will benefit from electric vehicle penetration, however the primary driver of growth for manganese ore will be steelmaking, and a variety of end use applications generally related to economic health for copper. A significant copper supply gap of around 5 Mtpa is expected by 2030 in the absence of new mine capacity, indicating that inducement pricing of > US$ 3.10/ lb Cu will be required to bring on new copper supply.

CRU expects copper and $NiSO_4$ prices to rise in real terms by 2035, while manganese ore and $CoSO_4$ prices are forecast to remain flat, due to current prices being at or near a high point in the cycle, recent fall in prices, and expected modest growth in the global steel industry after the COVID 19 epidemic. The long-term cost of production is expected to rise for both copper and $NiSO_4$, helping to support prices.

The $NiSO_4$, $CoSO_4$ and copper to be produced by NORI are expected to be chemically and physically standard products and no marketability issues are expected. The sulphate forms ($NiSO_4$, $CoSO_4$) of these products are expected to be premium products and attract premia over pure nickel and cobalt.

The manganese silicate product differs in both physical and chemical specifications from standard forms of ore found in the market. NORI's manganese silicate is expected to have a manganese grade of around 40%, which matches neither the high grade (44% Mn) or low-grade (36–38% Mn) ore benchmarks. The product is expected to have SiO_2 and Al_2O_3 contents exceeding the most desirable levels for manganese products but a desirable high Mn to Fe ratio. NORI's processing route also reduces the oxidation state of the manganese oxide from MnO_2 to MnO, which will reduce the energy requirements for customers' downstream processing. On balance, CRU recommended adopting a small premium of 1- 3% of the 44% Mn ore benchmark price.

17 Environmental Studies, Permitting, and Social or Community Impact

The ISA is mandated through UNCLOS to organize, regulate, and control all mineral related activities in the international seabed Area whilst preserving and protecting the marine environment. As the TOML Areas are in the international seabed Area, the ISA is responsible for assessing any Environmental and Social Impact Assessment prepared by TOML and for granting the relevant contracts.

Between 1998 and 2014, the ISA held workshops and developed a number of documents to provide guidance to contractors with respect to its expectations for responsible environmental management during the exploration and exploitation phases of mineral development. The ISA held a workshop “Towards an ISA environmental management strategy for the Area” over 20-24 March 2017 in Berlin Germany. The results of the workshop were published as ISA Technical Study 17 (ISA 2017).

The ISA has issued Regulations on Prospecting and Exploration for Polymetallic Nodules (adopted on 13 July 2000, updated on 25 July 2013). The regulations were complemented by the Legal and Technical Commission (LTC) recommendations for the guidance of contractors on assessing the environmental impacts of exploration (ISBA/25/LTC/6/Rev.1) which was most recently updated on 30 March, 2020. The draft exploitation regulations on deep-seabed mining were discussed at the 25th Session of the ISA (25 February to 1 March 2019 in Kingston Jamaica). The ISA had declared a target of 2020 to have the regulations approved but the COVID-19 pandemic disrupted the ISA program.

Although the environmental impact review process has not yet been finalised, the draft regulations outline the application process and the conditions that Contractors would need to implement during operations. All contractors have been made aware that the ISA requires the completion of the Environmental and Social Impact Assessment (ESIA) studies, culminating in an Environmental Impact Statement (EIS), in support of their applications for an exploitation license. Guidance for contractors in terms of what will be expected in the EIS has been provided in ISA Technical Study No. 10 (ISA 2012a). Further guidance will be provided with the completion of Standards and Guidelines for exploitation activities. The LTC has prioritized the development of six Standards and Guidelines, with three released for public comment in 2020 and the remaining three expected to be released in early 2021. The EIS, along with an Environmental Management System with subordinate Environmental Management and Monitoring Plans (EMMP), will be required as part of the application for an exploitation license within the Contract Area.

The environmental permitting process for the Area has been developed through a consultation program initiated by the ISA in 2013 and includes feedback obtained from multiple stakeholder groups. It is expected to involve a series of checks and balances, with reviews being conducted by the LTC with input from independent experts, as required. The recommendations of the LTC will then go before the ISA Council, which will then review the information provided and decide whether to approve the license application and, if so, what conditions should be applied.

The LTC has recommended seven key areas of information for the development of EIAs. These are physical oceanography, chemical oceanography, sediment properties, biological communities, bioturbation, sedimentation, and geological properties. These will form the key investigation topics for surveys within the Area, including the TOML Areas.

As sponsoring state, Tonga has a responsibility to ensure that TOML’s activities in the international seabed area are carried out in conformity with Part XI of UNCLOS.

Under ISA requirements contractors are required to submit five-year work programs. The first TOML five-year work program was completed in 2016 and reviewed and accepted by the ISA in late 2016.

For the second five-year period ending in 2022 TOML proposed the following program.

- Continue environmental baseline work;
- Complete pilot testing;
- Complete geotechnical studies;
- Complete feasibility studies;
- First draft EIA/EMP;
- Continue training.

TOML noted that the program was:

- Dependent on success at each stage;
- Subject to change based on findings at hand at any particular time; and
- Reliant on funding which in turn is dependent to some extent on macro-economic conditions and development with regards to the Authority and its stakeholders.

As a result of the financial state of the company, TOML did not progress at the rate intended until TOML was purchased by DeepGreen in March 2020. TOML currently plans an aggressive program of offshore campaigns in 2021–2023 focussing on resource assessment and environmental base line studies with the objective of upgrading the TOML F resource area to Indicated Mineral Resource status and completing environmental baseline studies and ESIA for the TOML F resource area.

18 Capital and Operating Cost

Capital and operating costs have not been estimated for the TOML Areas.

There are no Mineral Reserve estimates for the TOML Exploration Area of the CCZ and the potential viability of the Mineral Resources has not yet been supported by a pre-feasibility study or a feasibility study.

19 Economic Analysis

A cash flow analysis has not been developed for the TOML Areas.

There are no Mineral Reserve estimates for the TOML Exploration Area of the CCZ and the potential viability of the Mineral Resources has not yet been supported by a pre-feasibility study or a feasibility study.

20 Adjacent Properties

Nauru Ocean Resources Inc (NORI), a wholly-owned subsidiary of DeepGreen, holds exploration rights to four areas (NORI Area A, B, C, and D, the Property) in the CCZ that were granted by the International Seabed Authority (ISA) in 2011. NORI is sponsored to carry out its mineral exploration activities in the Property by the Republic of Nauru, pursuant to a certificate of sponsorship signed by the Government of Nauru on 11 April 2011.

Several other contractors have rights in the CCZ under the ISA, as described in Section 5 and summarized in Figure 3.1.

Lockheed Martin Systems Co (LMS) or Ocean Minerals Company (OMCO; GPO, 2011, Spickermann, 2012) is recognised to have two US licenses granted by NOAA (Section 5).

To date, no commercial production of polymetallic nodules has taken place in the CCZ.

21 Other Relevant Data and Information

As part of the eighteenth session of the ISA in July 2012, (ISA 2012b). Nine APEIs within the CCZ were designated by the Council of the ISA as part of an environmental management plan. None of the nine areas impact the TOML Exploration Area.

The APEIs are an important part of the ISA's EMP for the CCZ (ISA, 2012b; Smith et al, 2010) they aim to:

- Protect large enough areas to maximise both conservation benefits and exploitation benefits (at present they are more extensive than areas granted by the ISA to contractors for development;
- Be arranged to provide representative cover of different subregions as defined by productivity gradients and faunal turnover and as many seamounts as possible;
- Each APEI is large enough to ensure a core area is remote from even pessimistic estimates of impact from deep-sea mining;
- Complement ecosystem based management strategies for the area.

The APEIs were reviewed as required by policy in 2014 for the purposes of forthcoming review of the ISA's EMP and the decision (or not) to extend their location and validity. Independent consultants Seascape (Seascape Consultants, 2014) found no reason to change the APEI.

22 Interpretation and Conclusions

TOML holds tenement over a significant part (74 713 km^2) of the CCZ polymetallic nodule deposit in six areas (Areas A to F). These licences are under a contract for exploration of polymetallic nodules signed with the International Seabed Authority which has its remit from the United Nations Convention on the Law of the Sea.

Historical work over the last four decades has shown the deposit to be widespread and of very consistent grades. Exploration and development have progressed over this period, including scientific discovery and characterisation, successful efforts at trial mining, and bench scale metallurgical processing.

Work by TOML confirmed the historical data available for Mineral Resource estimation and furthermore provides significant additional detail and evidence for continuity such that Mineral Resource estimates of higher confidence can be determined. TOML also completed sampling of environmental and geotechnical data that is still being analysed. To date results complement, but have not revealed anything fundamentally different from, available historical work.

TOML Exploration Areas A to F have sufficient samples of adequate quality to define a Mineral Resource for Mn, Ni, Cu and Co. The estimate of abundance and hence tonnage for the Inferred Mineral Resource for the TOML Exploration Areas A to F may be biased low due to reliance on free fall grab samples in places.

The 2020 Mineral Resource estimate (Measured, Indicated and Inferred Mineral Resources), which was informed by data collected by TOML in 2013 and 2015, is presented in Table 11.9.

Due to the extremely low variance in the grades and the high metal content of the nodules, a cut-off based on abundance is appropriate for determining the limits of economic exploitation. A cut-off of 4 kg/m^2 abundance was chosen for the TOML Area, based on the estimates of costs and revenues presented in the Initial Assessment (IA) of the Mineral Resource contained in NORI Area D (AMC, 2021). The metal prices assumed in the calculation of the cut-off were: nickel metal US$16,472/t; nickel in nickel sulphate US$18,807/t Ni; copper metal US$6,872/t; cobalt metal US$46,333/t; cobalt in cobalt sulphate US$56,920/t Co; manganese in manganese silicate US$4.50/dmtu. The price estimates are long term (2034–2046) forecasts provided in a report by CRU International Limited (CRU, 2020). The QP considers that this timeframe is reasonable in view of the likely time required to bring the majority of the TOML Mineral Resources into production.

Comparison of the 2013 Inferred Mineral Resource estimate and the 2020 estimate shows that the additional data has increased the total Mineral Resource tonnage by 3%. In the areas with the most new data (the Indicated and Measured areas), abundance and grades are all higher in the new model than the 2013 model. These changes show that it is reasonable to expect that the majority of Inferred Mineral Resources could be upgraded to Indicated or Measured Resources with further exploration.

The ISA is mandated through UNCLOS to organize, regulate, and control all mineral related activities in the international seabed Area whilst preserving and protecting the marine environment. As the TOML Areas are in the international seabed Area, the ISA is responsible for assessing any Environmental and Social Impact Assessment prepared by TOML and for granting the relevant contracts.

The ISA has issued Regulations on Prospecting and Exploration for Polymetallic Nodules. Draft exploitation regulations on deep-seabed mining were discussed at the 25th Session of the ISA (25 February to 1 March 2019 in Kingston Jamaica). The ISA had declared a target of 2020 to have the regulations approved but the COVID-19 pandemic disrupted the ISA program.

Although the environmental impact review process has not yet been finalised, the draft regulations outline the application process and the conditions that Contractors would need to implement during operations. All contractors have been made aware that the ISA requires the completion of the Environmental and Social Impact Assessment (ESIA) studies, culminating in an Environmental Impact Statement (EIS), in support of their applications for an exploitation license. Guidance for contractors in terms of what will be expected in the EIS has been provided in ISA Technical Study No. 10 (ISA 2012a). Further guidance will be provided with the completion of Standards and Guidelines for exploitation activities.

The TOML area and the NORI Property occur within the vast polymetallic nodule field in the Clarion Clipperton Zone of the Pacific Ocean. This mineral field is essentially a single mineral deposit almost 5,000 km in length and up to 600 km wide. The size and level of uniformity of mineralization is unmatched by any mineral deposit of similar value on land. The mechanism of formation of the nodules is interpreted to be essentially identical across the entire CCZ, with only minor local variations. Consequently, there is relatively little difference between the size, shape or metal content of the nodules from one area to another.

The morphological features of the seafloor are similar in the TOML and the NORI Areas, which all lie within the Abyssal Plains and are characterized by sub-parallel basaltic lava ridges called abyssal hills. The Areas are punctuated by typically extinct volcanic knolls and seamounts and scattered sediment drifts in which few nodules are preserved at the seafloor.

The polymetallic nodules in the TOML and NORI Areas have similar morphological, mineralogical, and grade characteristics. All published historical work indicates that processing of nodules is technically feasible.

The TOML Mineral Resource estimates are supported by an Initial Assessment carried out on behalf of DeepGreen for the NORI Property (AMC, 2021).

The IA proposes that nodules will be collected from the seafloor by self-propelled, tracked, collector vehicles. No rock cutting, digging, drill-and-blast, or other breakage will be required at the point of collection. The collectors will be remotely controlled and supplied with electric power via umbilical cables from production support vessel (PSV). Suction dredge heads on each collector will recover a dilute slurry of nodules, sediment, and water from the seafloor. A hopper on each vehicle will separate sediment and excess water, which will pass out of the hopper overflow, from the nodules, which will be pumped as a higher concentration slurry via flexible hoses to a riser. The riser is a steel pipe through which nodules will be transferred to the surface by means of an airlift.

The PSV will support a riser and lift system (RALS) and its handling equipment, and will house the airlift compressors, collector vehicle control stations, and material handling equipment. All power for off-shore equipment, including the nodule collecting vehicles, will be generated on the PSV. The PSVs will be equipped with controllable thrusters and will be capable of dynamic positioning (DP), which will allow the vessels and risers to track the collectors. Nodules will be discharged from the RALS to the PSVs, where they will be dewatered and temporarily stored or transferred directly to a transport vessel.”

The polymetallic nodules in the TOML and NORI Areas have similar morphological, mineralogical, and grade characteristics. The IA for NORI Area D assessed a combine pyrometallurgical and hydrometallurgical mineral processing scenario. The first part of the pyrometallurgical process is the Rotary Kiln Electric Furnace (RKEF) process that is widely used in the nickel laterite industry. The second pyrometallurgical step (sulphidisation of the alloy produced in the first step to form a matte and then partially conversion in a Peirce-Smith converter to remove iron), while not widely practiced, also has commercial precedent at the Doniambo plant of Societe Le Nickel in New Caledonia.

Sulphuric acid leaching of matte from the pyrometallurgical process has precedent in the platinum group minerals (PGM) industry. Although copper producers typically have a solvent extraction step before electrowinning of their copper, direct copper electrowinning is done in most PGM refineries, where nickel and cobalt are also significant pay-metals. This is to maximise nickel recovery and minimise operating expenses. The nickel and cobalt are purified using solvent extraction, ion exchange and precipitation, which are all commercially proven hydrometallurgical processes. Battery grade nickel and cobalt sulphate are then crystallised from the purified solutions.

The pyrometallurgical process forms two by-products as well as the matte for the hydrometallurgical refinery:

- Electric furnace slag containing silica and 53% MnO that is intended to be sold as feed to the Si-Mn industry.
- A converter aisle slag that could be used for aggregate in road construction or other applications.

The hydrometallurgical refinery generates iron residues that would, for a stand-alone plant, require disposal. However, these streams can be recycled back to the pyrometallurgical plant for re-treatment and recovery of entrained pay metals.

Selection of ammonia as a principal reagent in the hydrometallurgical refinery means that an additional by-product—ammonium sulphate—is generated. This could be sold into the fertiliser industry.

The copper cathode quality from direct electrowinning, without a solvent extraction step, is expected to be ≥99.9% Cu. Quality of the matte produced in the pyrometallurgical plant will have an impact on this, including the potential carryover of impurities beyond values assumed for the purpose of the IA.

The production of battery-grade nickel and cobalt sulphates is targeted instead of nickel or cobalt cathodes or other intermediate products.

In summary:

- All parts of the proposed process have commercial precedents in similar or analogous industries, however not as a whole continuous flowsheet.
- Pay-metals are recovered in the following forms:
  - Copper cathodes with an expected quality of ≥99.9% Cu.
  - Battery-grade nickel sulphate.
  - Battery-grade cobalt sulphate.
- Rather than generating large waste streams, the process produces by-products including high manganese content furnace slag and ammonium sulphate.

The process assumptions used in this study will need to be verified as the project proceeds.

The QP considers that this IA supports the view that there are reasonable prospects of economic extraction of polymetallic nodule Mineral Resources in the TOML Areas.

The infrastructure requirements for the development of commercial production in the TOML Areas, apart from the minerals processing facility, will be modest compared to terrestrial resources projects of similar production capacities.

The site and host country for the minerals processing facility has not yet been confirmed. The site must be serviced by grid power, reticulated water, and natural gas. A location will be selected that is close to an industrial port, and near an existing municipality from which labour can be sourced.

A preliminary assessment of the transportation fleet for transfer of nodules from the CCZ to an existing deep-water industrial port equipped with bulk offloading facilities was examined (AMC, 2021). The IA assumed that chartered vessels would be used to transport the dewatered nodules to the port of Lazaro Cardenas, Michoacan, Mexico, 960 nm from the NORI Area D reference site. The vessels would be converted bulk mineral carriers with dynamic positioning (DP) to allow tracking behind the production support vessels during operations. The method of offloading, known as tandem offloading, is well established for offloading of oil production vessels in remote areas of the world.

AMC has considered the market for the nickel, copper, cobalt and manganese products that might be recovered from the polymetallic nodules in the TOML Areas.

CRU International Limited (CRU) was commissioned by NORI to provide market overviews for the four main products from the NORI Area D Project: nickel sulphate ($NiSO_4$), cobalt sulphate ($CoSO_4$), copper, and a manganese product (CRU, 2020). CRU expects growth in these markets.

CRU expects copper and $NiSO_4$ prices to rise in real terms by 2035, while manganese ore and $CoSO_4$ prices are forecast to remain flat, due to current prices being at or near a high point in the cycle, recent fall in prices, and expected modest growth in the global steel industry after the COVID 19 epidemic. The long-term cost of production is expected to rise for both copper and $NiSO_4$, helping to support prices.

The QPs consider that the proposed development of NORI Area D is a reasonable analogue for future development in the TOML Areas and the IA completed for the NORI Property is directly relevant and applicable to the TOML Property. The QPs consider that this IA supports the view that there are reasonable prospects of economic extraction of polymetallic nodule Mineral Resources in the TOML Areas.

23 Recommendations

It is recommended that future work on the TOML Area focus on determining the viability of mining systems through trial nodule mining and appropriate methods for predicting, monitoring and controlling production rates during mining. Additionally, key modifying factors need to be constrained to a point where a Mineral Reserve could potentially be estimated for the TOML Exploration Areas.

Exploration

- Undertake additional box core sampling campaigns to raise the Inferred Mineral Resources to Indicated and Measured status. The proximity of TOML Area F to NORI Area D suggests that TOML Area F should be a priority.
- Undertake additional photo profiling in areas categorized as Indicated Mineral Resource to increase the Measured Mineral Resource.
- Investigate automated processing of nodule photographs to estimate nodule abundance using the long-axis method. This will allow very detailed short-range determination of abundance along photo-profile lines informing a simulation study regarding variability during mining.
- Undertake a conditional simulation study to quantify the uncertainty and risk in nodule abundance. This will likely help provide production bounds for the operating system(s).
- Undertake additional photo profiling in areas categorized as Indicated Mineral Resource to increase the Measured Mineral Resource well ahead of commercial extraction of the existing Measured Mineral Resource.

Environment

- Complete analysis of data collected during the TOML CCZ13 and CCZ15 campaigns, including analysis of oceanographic information, taxonomy of collected samples, habitat mapping from photo profiles, collection of moorings to enable:
  - Integration with CCZ-wide published data.
  - Environmental baseline conditions to be documented.
- Complete new environmental baseline studies and ESIA for TOML Area F.
- Develop a monitoring programme to accompany future work, including trial mining.

Engineering and Commercial Concept

- Complete analysis of geotechnical data collected during the TOML CCZ15 campaign.
- Complete system concept design and options and risking exercises.
- Prepare economic and commercial studies to provide scoping estimates for CAPEX and OPEX for mining, transportation and processing options.
- Complete metallurgical research and pilot testing of nodules.
- Advance engineering design.

Trial Mining

- Conduct a trial mining operation within the TOML Area, which will inform a commercial mining feasibility study. This should include:
  - Fabrication of pilot scale equipment;
  - Appropriate permitting;
  - Selection of a candidate site(s).
- Include an environmental monitoring programme, which will inform a commercial mining EIS.

Possible budgets required for this work over the next two to three years may total $US30–50 million.

24 References

Agarwal, J. C. and Beecher, N., 1976, “Processing of Ocean Nodules: A technical and Economic Review”, JOM, April 1976, pp.24-31

Agarwal, J. C., Barner, Herbert E. and Beecher, N., 1978, “Kennecott Process for Recovery of Copper, Nickel, Cobalt and Molybdenum from Ocean Nodules”, Society of Mining Engineers of AIME preprint number 78-B-89

Althaus, F., Hill, N., Ferrari, R., Edwards, L., Przeslawski, R., Schönberg, C.H.L., Stuart-Smith, R., Barrett, N., Edgar, G., Colquhoun, J., Tran, M., Jordan, A., Rees, T. & Gowlett-Holmes, K., 2015, A standardised vocabulary for identifying benthic biota and substrata from underwater imagery: The CATAMI classification scheme. PLoS ONE, DOI:10.1371/journal.pone.0141039

AMC, 2016. TOML Clarion Clipperton Zone Project, Pacific Ocean. Technical Report compiled under NI-43-101 by AMC Consultants Pty Ltd for Nautilus Minerals, March 2016.

AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion Clipperton Zone, Pacific Ocean for DeepGreen Metals Inc. in accordance with the requirements of SEC Regulation S-K (subpart 1300), dated 17 March 2021.

Andreev, C.I 1994 Metallogenesis of ferromanganese formations in the Pacific Ocean. Nedra, St Petersburg

Backer, H. and Fellerer, R. 1986, Chapter 7 Marine mineral exploration examples. In H. Kunzendorf ed Marine Mineral Exploration Elsevier Oceanography Series 41 ISBN 0-444-42627-2

Bazylevskaya E. S. 1973. On the question of mineral composition of ferromanganese nodules. Reports of the Academy of Sciences of the USSR, vol. 210, no 2.

Bezrukov, P. L., 1962, Distribution of ferro-manganese concretions on the floor of the Indian Ocean, Okeanologiya, v. 2, p. 1014-1019. (in Russian)

Bezrukov, P. L., 1963, Studies of the Indian Ocean during the 35th campaign of the R.V. “Vityaz”, Okeanologiya, V. 3, p- 540-549. (in Russian)

Bezrukov, P. L., 1969, The 43rd campaign of the Research Vessel “Vityaz” in the Central Pacific, Oceanology, v. 9, p. 153-160.

Bezrukov P.L. 1976. Pacific ferromanganese nodules. Tr. IO of the USSR Academy of Sciences, vol. 109 M., Nedra

Bezrukov P.L. 1979 Ferromanganese nodule ore geology Sedimentation and magmatism of the oceans. Ocean series Oceanology, Science, pp. 345-357.

Bezrukov, P. L., and P. F. Andrushchenko, 1972, Iron-manganese nodules from the Indian Ocean, Izv. Akad. Nauk USSR, Ser. Geol., V. 7, p. 3-20. Transl. in Intl. Geol. Rev., 1973, V. 15, p. 342-356.

Bischoff, J.L and Piper, D.Z. 1979. Marine Geology and Oceanography of the Pacific Manganese Nodule Province. Plenum Press New York

BODC (British Oceanographic Data Centre). 2014. GEBCO Gridded Bathymetric Data, URL: http://www.gebco.net/data_and_products/gridded_bathymetry_data/

Brockett, F.H. 1994, Deep-sea mining simulation for benthic impact experiment. Man and machine underwater. Underwater Intervention'94. 7-10 February, San Diego, California

Brockett, F.H., and Kollwentz, W. M. 1977, An international project – nodule collectors. Proceedings 9th Annual Offshore Technology Conference, Houston Texas, May 2-5

Brockett, F.H., Huizingh, J.P. and McFarlane, J.A.R., 2008. Updated analysis of the capital and operating costs of a manganese nodule deep ocean mining system developed in the 1970s. Proceedings ISA Workshop, Chennai, India

Burns, J. Q. and Suhm, S. L., 1979, "Design and Analysis of Hydraulic Lift Systems for Deep Ocean Mining", Proceedings, Offshore Technology Conference, Paper OTC 3366, Houston, Texas

Chang S.W., Choi, H. Lee, S.R. 2005 Seafloor Occurrence And Growth Stages Of KODOS Ferromanganese Nodules Underwater Mining Conference Abstract Volume California 1-6 November 2005

Churchill, R.R. and Lowe, A.V. 1988. The Law of the Sea, 2nd Edition, Manchester University Press.

CIA (Central Intelligence Agency), 2012. Project AZORIAN https://www.cia.gov/about-cia/cia-museum/experience-the-collection/text-version/stories/project-azorian.html downloaded 18/3/16.

Clarke, KR, Gorley, RN, 2006. PRIMER v6: User Manual/Tutorial. PRIMER-E, Plymouth, 192pp.

Cochonat, P., Le Suave, R., Charles, C., Greger, B., Hoffert, M., Lenoble, J.P., Meunier, J. and Pautot, G., 1992. First in situ studies of nodule distribution and geotechnical measurements of associated deep-sea clay (Northeastern Pacific Ocean). Mar. Geol., 103: 373-380.

COMRA (China Ocean Mineral Resource R&D Association), 2013a Manganese nodules development. http://www.comra.org/2013-09/23/content_6322906.htm Downloaded 29/3/16

COMRA (China Ocean Mineral Resource R&D Association), 2013b Using high-tech means fruitful full survey results. http://www.comra.org/2013-09/23/content_6322833.htm Downloaded 29/3/16

COMRA (China Ocean Mineral Resource R&D Association), 2013c Deep-sea mining pilot test system integrated lake success. http://www.comra.org/2013-09/23/content_6322823.htm Downloaded 29/3/16.

CRU, 2020. Updated PEA market input. Report for DeepGreen Metals. Dated 23/10/2020.

Cyberneticzoo 2015. 1958 – RUM – Remote Underwater Manipulator – Victor Anderson (American). http://cyberneticzoo.com/underwater-robotics/1958-rum-remote-underwater-manipulator-victor-anderson-american/ Downloaded 5th April 2016

Davies C.E., Moss D., and Hill M.O. 2004, EUNIS Habitat Classification Revised 2004. European Environment Agency.

DOMES (Deep Ocean Mining Environmental Study). 1981. Final Programmatic Environmental Impact Statement, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Ocean Minerals and Energy, September 1981, 295 p.

DORD (Deep Ocean Resources Development Co Ltd) 2010. Environmental work carried out by DORD: Environmental study for manganese nodules development in Japan DORD mining area during 1989-1996. Presentation for ISA workshop for environment, November 2010 Kingston Jamiaca Presentations www.isa.org.jm Downloaded 15/5/15

DORD (Deep Ocean Resources Development Co Ltd) 2013. About us and our business http://www.dord.co.jp/english/index.html Downloaded 5th April 2016.

DORD (Deep Ocean Resources Development Co Ltd) 2014. Polymetallic nodule resources evaluation: how we are doing. Presentation for ISA workshop for mineral resources, October 2014 Goa, India www.isa.org.jm Downloaded 16/10/14

Doyle, R and Halkyard, J., 2007, “Large Scale Airlift Experiments for Application to Deep Ocean Mining”, Proceedings of the ASME 26th International Conference on Ocean, Offshore and Arctic Engineering, OMAE 2007-29641

Dubs, M. A., 1983, Comment, 46 Law and Contemporary Problems 81-86 (Spring 1983), Available at: http://scholarship.law.duke.edu/lcp/vol46/iss2/13

EC (European Commission) 1997 Environmental risks from large-scale ecological research in the deep sea: a desk study. Prepared for commission of the European Communities Directorate-General for Science, Research and Development under contract no. Mas2-ct94-0086. www.vliz.be/imisdocs/publications/259240.pdf downloaded 10th May 2016

Fabi, R. 2010 Unacceptable danger for Indonesian nickel laterite ship crews - Trade Group. Mine Web online magazine. 7/12/2010, accessed March 14, 2013 at http://www.mineweb.com/mineweb/content/en/mineweb-fast-news?oid=116423&sn=Detail&pid=102055

Felix, D. 1980 Some problems in making nodule abundance estimates from sea floor photographs. Marine Mining Volume2 Number 3

FGDC (US Federal Geographic Data Committee), 2012, Coastal and Marine Ecological Classification Standard, Washington. http://www.fgdc.gov/standards/projects/cmecs-folder/CMECS_Version_06-2012_FINAL.pdf Downloaded May 2016.

Fike, D. A., Grotzinger, J.P., Pratt, L.M. and Summons, R. E. 2006. Oxidation of the Ediacaran Ocean. Nature 444, 744-747

Flanagan, F.J., and Gottfried, D., 1980, USGS Rock Standards, III: Manganese-Nodule Reference Samples USGS-NOD-A-1 and USGS-NOD-P-1: U.S. Geological Survey Professional Paper 1155, 39 p.

Fouquet, Y. Depauw, G. GEMONOD, 2014, Polymetallic nodules resource classification – French effort 1970-2014, ISA 2014 Mineral Resource Workshop Presentations www.isa.org.jm Downloaded 16/10/14

Friedrich, G., Glasby, G.P., Thijssen, T. and Pluger, W.L., 1983. Morphological and geochemical characteristics of manganese nodules collected from three areas on an equatorial Pacific transect by R.V. Sonne. Marine Mining, 4,167-254.

Fuerstenau, D. W., Herring, A. P., and Hoover, M., 1973. Characterisation and extraction of metals form sea floor Manganese Nodules. Transactions, vol 254 Society of Mining Engineers, AlME pp. 205-211

Futterer, D. K., 2006. The solid phase of marine sediments. In Schulz, H.D. and Zabel, M. 2006. Marine Geochemistry 2nd edition Springer

Geminder, R. and Lecourt, E.J.. 1972. Deep ocean mining system tested. World Dredging and Marine Construction, 8(8): 35-38.

Glasby, G.P.; Thijssen, T.; Pluger, W.L.; Friedrich, G.; Mangini, A.; Stoffers, P.; Dominik, J.; Frenzel, G.; Andrews, J.E.; Roonwal, G.S. 1983: Manganese nodule distribution, mineralogy and geochemistry and relation to sediment type in the Aitutaki Passage, SW Pacific. In Hawaii Institute of Geophysics, HIG-83-1.

Glasby, G.P. 1986 Marine Minerals in the Pacific in Oceanography and Marine Biology: An annual review Vol 24 ed H. Barnes and M Barnes. Aberdeen University Press

Glasby, G.P. 2006 Manganese: Predominant role of nodules and crusts. In Schulz, H.D. and Zabel, M. 2006. Marine geochemistry 2nd edition Springer

Golder Associates, 2013. Updated NI43-101 Technical Report, Clarion-Clipperton Zone Project, Pacific Ocean. Independent Technical Report prepared by Golder Associates for Nautilus Minerals, March, 2013.

Gooday, A. J., Goineau, A. & Voltski, I. 2015. Abyssal foraminifera attached to polymetallic nodules from the eastern Clarion Clipperton Fracture Zone: a preliminary description and comparison with North Atlantic dropstone assemblages. Marine Biodiversity, 45(3): 391-412.

GPO (Government Printing Office) 2011, Deep Seabed Mining: Request for Extension of Exploration Licenses https://www.gpo.gov/fdsys/granule/FR-2012-02-29/2012-4613/mods.xml Downloaded 14th April 2016.

GSR, 2014, Lead-up of the project and context. ISA 2014 Mineral Resource Workshop Presentations www.isa.org.jm Downloaded 16/10/14

Guntrip, E. 2003. The common heritage of mankind: an adequate regime for managing the deep seabed? Melbourne Journal of International Law Vol 4. Downloaded 17/11/14 from http://www.law.unimelb.edu.au/files/dmfile/downloadaf021.pdf

Halkyard, J.E., 1979 “Deep Ocean Mining for Manganese Nodules”, Physics in Technology, The Institute for Physics, UK, V. 10

Halkyard, J. E., 1980, “Ore Handling and Transfer at Sea”, Marine Technology Society, Annual Conference and Exhibition, Washington, DC, USA

Halkyard, J. E., 1982, “Ocean Engineering Challenges in Deep-Sea Mining”, Society of Naval Architects and Marine Engineers, Spring Meeting/STAR Symposium, April, Honolulu, Hawaii USA

Hayes, S.P. 1979, Benthic current observations at DOMES sites A, B, C in the tropical north Pacific Ocean, in Bischoff J.L. and Piper, D.Z eds Marine Geology and Oceanography of the Pacific manganese nodule province. Marine Science Vol 9 Plenum Press

Haynes, B.W., Law, S.L., Barron, D.C., Kramer, G.W., Maeda, R. And Magyar, M.J., 1985. Pacific manganese nodules: characterisation and processing. United States Geological Survey Bulletin 679.

Hein, J.R. and Koschinsky, A., 2013, Section 13.11 Deep-Ocean Ferromanganese Crusts and Nodules, in Treatise on Geochemistry, 2nd edition, v. 13, chapter 11, S. Scott (ed).

Heine, O. R. and Suh, S. L., 1978, “An Experimental Nodule Collection Vehicle Design and Testing”, Proceedings, Offshore Technology Conference, Paper OTC 3138, Houston, Texas USA

Hennigar, H.F, R.E. Dick and E.J. Foell, 1986, Derivation of Abundance Estimates for Manganese Nodule Deposits: Grab Sampler Recoveries to Ore Reserves, Offshore Technology Conference, OTC 5237, May 1986, Houston, TX, 5 p

Herrouin, G. 2009. The exploitation of nodules polymétalliques: Fantasy or Reality? Published in La Chimie et la mer pp81-98 http://www.mediachimie.org/ressource/lexploitation-des-nodules-polym%C3%A9talliques-utopie-ou-r%C3%A9alit%C3%A9 Downloaded 16/6/14

Hessler, R.R. and Jumars, P.A., 1974 Abyssal community analysis from replicate box cores in the central North Pacific. Deep-sea research, 21 pp185-209

History Magazine, 2013, The transatlantic cable. http://www.history-magazine.com/cable.html Downloaded March 2013

Hoagland, P, Yang, J, Broadus, J.M. and Chu, D.K.Y 1992. Chapter 12: China Sea Coastal and Marine Nonfuel Minerals: Investigation and Development. In Resources and Environment in Asia's Marine Sector ed J. B March. Taylor and Francis

Hoffert, M., 2008 Les nodules polymétalliques dans les grands fonds océaniques : Une extraordinaire aventure minière et scientifique sous-marine. Vuibert editions

Ifremer, 1994. Polymetallic Nodules. http://wwz.ifremer.fr/drogm_eng/Mineral-resources/Polymetallic-nodules Downloaded 5/6/2014.

Ifremer, 2010 The polymetallic nodules: http://wwz.ifremer.fr/gm_eng/Activities/Mineral-resources/Ressources-minerales-grand-fond/Polymetallic-nodules/The-polymetallic-nodules downloaded 8 May 2016

Inall, M., Aleynik, D., Dale, A. and Vink, A. 2015. Central American Gap winds and abyssal CCZ plumes MIDAS Newsletter Issue 4 Spring 2015 http://www.eu-midas.net/sites/default/files/newsletters/MIDAS_Newsletter_Apr2015_HIRES.pdf Downloaded June 2016

InfoMine, "Moab Khotsong mine". Accessed March 2013 at http://www.infomine.com/minesite/minesite.asp?site=moabkhotsong

Ingri J., 1985 Geochemistry of ferromanganese concretions in the Barents Sea Marine Geology, 67 (1985) 101--119 101

ISA (International Seabed Authority), 1994, The International Seabed Authority Structure and Functioning, Fact Sheet. https://www.isa.org.jm/sites/default/files/files/documents/isastructfunct.pdf Downloaded May 2016

ISA (International Seabed Authority), 2000a. Decision of the Assembly relating to the regulations on prospecting and exploration for polymetallic nodules in the Area, ISBA-6A-18, https://www.isa.org.jm/files/documents/EN/6Sess/Ass/ISBA-6A-18.pdf Downloaded January 2012.

ISA (International Seabed Authority), 2000b. Global non-living resources on the extended continental shelf: Prospects at the year 2000. ISA Technical Study: No.1. ISBN 976-610-375-5

ISA (International Seabed Authority), 2001a. Patents Issued for Technologies for Deep Seabed Polymetallic Nodule Exploration and Mining: 1960-1998; (July 2001) Volumes 1-5; and Volumes 6-10Volumes 6-10; ISBN 976-610-389-5

ISA (International Seabed Authority), 2001b, Proposed Technologies for Deep Seabed Mining of Polymetallic Nodules, Proceedings of the International Seabed Authority's Workshop 1999, Kingston, Jamaica; ISA/2001/07

ISA (International Seabed Authority), 2003. Establishment of a geological model of the polymetallic nodule resources in the Clarion-Clipperton Fracture Zone of the Equatorial North Pacific Ocean : Proceedings of the 13-20 May 2003 International Seabed Authority workshop held in Nadi, Fiji ISBN: 976-95217-3-6

ISA (International Seabed Authority), 2004. Polymetallic nodules. Brochure. Downloaded 20/3/16 https://www.isa.org.jm /files/documents/EN/Brochures/ENG7.pdf

ISA (International Seabed Authority), 2008, Biodiversity, species ranges, and gene flow in the abyssal Pacific nodule province: predicting and managing the impacts of deep seabed mining. ISA Technical Study No 3 https://www.isa.org.jm/files/documents/EN/Pubs/TechStudy3.pdf

ISA (International Seabed Authority), 2010. A Geological Model of Polymetallic Nodule Deposits in the Clarion-Clipperton Fracture Zone and Prospector's Guide for Polymetallic Nodule Deposits in the Clarion-Clipperton Fracture Zone. International Seabed Authority Technical Study: No. 6 ISBN: 978-976-95268-2-2

ISA (International Seabed Authority), 2011 Seabed Authority signs contract for exploration of polymetallic nodules in a reserved area by Nauru Ocean Resources Incorporated, SB/17/17, https://www.isa.org.jm/sites/default/files/files/documents/sb-17-17.pdf Downloaded 9th June 2016

ISA (International Seabed Authority), 2012a. RE: Tonga Offshore Mining Exploration Data. Email from Vijay Kodagali to Charles Morgan Thursday 21st June 2012.

ISA (International Seabed Authority), 2012b. Decision of the Council relating to an environmental management plan for the Clarion-Clipperton Zone. Missive of the ISA Council, 18th Session, 26th July 2012. (ISBA/18/C/22) https://www.isa.org.jm/files/documents/EN/18Sess/Council/ISBA-18C-22.pdf downloaded 7th May 2016

ISA (International Seabed Authority), 2012c. Member States http://www.isa.org.jm/en/about/members/states accessed 1 September 2012.

ISA (International Seabed Authority), 2013a, Decision of the Council of the International Seabed Authority relating to amendments to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area and related matters. ISBA/19/C/17 https://www.isa.org.jm/sites/default/files/files/documents/isba-19c-17_0.pdf Downloaded 7th May 2016

ISA (International Seabed Authority), 2013b Decision of the Assembly of the International Seabed Authority regarding the amendments to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, ISBA/19/A/9, https://www.isa.org.jm/sites/default/files/files/documents/isba-19a-9_0.pdf Downloaded 7th May 2016

ISA (International Seabed Authority), 2015a Agreement of cooperation between the International Maritime Organization and the International Seabed Authority. Note by the Secretary-General to Council, ISBA/21/C/10, https://www.isa.org.jm/sites/default/files/files/documents/isba-21c-10_1.pdf downloaded 7th May 2016

ISA (International Seabed Authority), 2015b. Submarine cables and deep seabed mining: advancing common interests and addressing UNCLOS “Due Regard” Obligations. ISA Technical Study: No. 14, International Seabed Authority Kingston, Jamaica

ISA (International Seabed Authority), 2015c Recommendations for the guidance of contractors on the content, format and structure of annual reports. ISBA/21/LTC/15 ISA https://www.isa.org.jm/sites/default/files/files/documents/isba-21ltc-15_1.pdf downloaded 7th May 2016

ISA (International Seabed Authority), 2015d Council agrees on criteria for approved contract extension, takes note of plans for exploitation regulations, adopts recommendation of Finance Committee. Press Release, https://www.isa.org.jm/sites/default/files/files/documents/sb-21-15.pdf Downloaded May 2016

Isaacs, C. R., 1973, “Dredging for Bulk Samples of Manganese Nodules”, Proceedings, Offshore Technology Conference, Paper OTC-1760, Houston, Texas, USA

Jenkyns, H.C. 1977. Fossil nodules, pp. 87-108 In: G.P. Glasby (ed). Marine Manganese Deposits. Elsevier, Amsterdam.

Jeong, J.S., Kang J.K. and Chough, S.K. 1994, Sedimentary processes and manganese nodule formation in the Korea Deep Ocean Study (KODOS) area, western part of Clarion-Clipperton fracture zones, northeast equatorial Pacific. Marine Geology, 122, 125-150

Jung, H.S., Lee, C.B., Jeong, K.S. and Kang, J.K., 1997 Geochemical and mineralogical characteristics in two-color core sediments form the Korea Deep Ocean Study (KODOS) area, northeast equatorial Pacific. Marine Geology, 144 295-309

Kajitani, Y. 1990. The Japanese Manganese Nodule Mining System. In Ardus, D.A. and Champ, M.A. eds Ocean Resources. Spinger Science and Business Media.

Kaluza, P. Kolzsch, A., Gastner, M.T. and Blasius, B., 2010. The complex network of global cargo ship movements. Journal of the Royal Society Interface, 7 pp1093-1103

Kamenskaya, O., Gooday, A. J., Radziejewska, T. & Wawrzyniak-Wydrowska, B. 2012. Large, enigmatic foraminiferan-like protists in the eastern part of the Clarion-Clipperton Fracture Zone (abyssal north-eastern subequatorial Pacific): biodiversity and vertical distribution in the sediment. Marine Biodiversity, 42, 311-327.

Kang, J.K.2008. Developing Deep Seabed Mineral Resources: Korea’s Effort http://documents.mx/download/link/developing-deep-seabed-mineral-resources-koreas-effort Downloaded 6/4/16

Kaufman, R. and Latimer J.P. 1971. The design and operation of a prototype deep ocean mining ship. Proceedings Society of Naval Architects and Marine Engineers, Spring Meeting, Honolulu, Hawaii, Vol. 3: 1 24.

Kaufman, R. and W.D. Siapno. 1972. Future needs of deep ocean mineral exploration and surveying. Offshore Technology Conference Preprints. Vol. 2., pp.309-332

Kazmin Y. 1984 (ed) Ferromanganese nodules of the oceans. Troy VNIIO Geology and mineral resources Worlds. Ocean, Nedra, 192, 167 p.

Keppel 2015, Ocean Mineral Singapore awarded contract for seabed exploration http://kepcorp.com/en/news_item.aspx?sid=5448 downloaded 7th April 2016

Killing, 1983. Strategies for joint venture success. Routledge Library Editions: International Business, Volume 22, Routledge

Kim, H.J, Kim. D., Yoo, C.M., Chi, S-B, Khim, B.K., Shin, H-R, Hyeong, K. 2011, Influence of ENSO variability on sinking-particle fluxes in the northeastern equatorial Pacific. Deep Sea Research I, 58, 865-874

KIOST (Korean Institute of Ocean Science and Technology), 2014, Status of Korea activities in resource assessment and mining technologies. ISA Workshop for Polymetallic Nodules Resource Classification Goa, India 13 to 17 October 2014. https://www.isa.org.jm/files/documents/EN/Workshops/2014a/KIOST.pdf Downloaded 16/10/14

Knodt. S. 2012. Technological and economical challenges of manganese nodule mining. Presentation at Expert conference deep-sea mining, BMWi Berlin

Kodagali, V. 2009. Review of Data used for the geological model. Workshop on the results of a project to develop a geological model of polymetallic nodule deposits in the Clarion-Clipperton Zone, Kingston Jamaica 14-17 December 2009., accessed March 11, 2013 at http://www.isa.org.jm/en/scientific/workshops/2009

Kollwentz, W. 1990. Lesson learned in the development of nodule mining technology. Materials and Society, Vol 14, No 3/4, pp 285-298.

Kotlinski, R., 2003, Relationships between nodule genesis and topography in the Eastern area of the C-C region, – Meeting of Scientists for the Preparation of a Programme of Work for the Development of a Geological Model of the Clarion-Clipperton Fracture Zone. International Seabed Authority, Nadi, Fiji. http://www.iom.gov.pl/uploads/iom_attachment-95635.pdf. Downloaded 17th April 2016

Kotlinski, R. and Stoyanova, V., 2006 Buried and surface polymetallic nodule distribution in the eastern Clarion–Clipperton Zone: main distinctions and similarities. Advances in Geosciences Vol. 9: Solid Earth, Ocean Science & Atmospheric Science (2006) Eds. Yun-Tai Chen et al. World Scientific Publishing Company, pp 67-74

Kotlinski, R., Stoyanova, V., Hamrak, H. and Avramov, A. 2008 An Overview of the Interoceanmetal (IOM) Deep-Sea Technology Development (Mining and Processing). Proceedings ISA Workshop, Chennai, India

Kuhn, T., Ruhlemann, C. and Wiedicke-Hombach, M. 2011, Development of methods and equipment for the exploration of manganese nodules in the German license area in the central equatorial Pacific. Proceedings of the Ninth (2011) ISOPE Ocean Mining Symposium Maui, Hawaii, USA, June 19-24, 2011

Kuhn, T., Ruhlemann, C. and Wiedicke-Hombach, M. 2012. Developing a Strategy for the Exploration of Vast Seafloor Areas for Prospective Manganese Nodule Fields. In Zhou, H. and Morgan, C.L. (eds.) Marine Minerals: Finding the Right Balance of Sustainable Development and Environmental Protection. The Underwater Mining Institute 2012, Shanghai, 9 pp.

Lecourt, E.J. and Williams, D.W., 1971. Deep ocean mining new application for oil field and marine equipment. Proceedings of the Offshore Technology Conference, Houston, Texas, 19-21 April 1971, OTC Paper 1412, Vol. 1:859868

Lee, G.C, Kim, J., Chi, S.B., Ko, Y.T and Ham, D.J., 2008. Examination for correction factor for manganese nodule abundance using the free fall grab and box corer. The Sea: Journal of the Korean Society of Oceanography, Vol 13, No. 3 pp 280-285

Li, L. and Jue, Z., 2005, Research of China's pilot-miner in the mining system of Polymetallic nodule, in Proceedings of The Sixth ISOPE Ocean Mining Symposium, Changsha, Hunan, China, ISBN 1-880653-65- 6

Marawa, 2012, About, http://marawaresearch.com/index.html Downloaded June 2016.

Masuda, Y., M.J. Cruickshank and J.L. Mero 1971. Continuous bucket-line dredging at 12,000 feet. Proc Offshore Technol. Conf, Houston, Texas, 19 - 21 April 1971, Vol. 1 (OTC Paper 1410): 837-858.

McKelvey V. E., Wright, N A and Rowland RW. 1979 Manganese Nodule Resources in the Northeastern Equatorial Pacific In Marine Geology and Oceanography of the Pacific Manganese Nodule Province Volume 9 of the series Marine Science pp 747-762

McKelvey, V.E., Wright, N.A. and Bowen, R.W., 1983. Analysis of the World Distribution of Metal-Rich Subsea Manganese Nodules. Geological Survey Circular 886, US Geological Survey.

Melnik, V. and Lygina, T., 2010. Environmental Research carried out by Yuzhmorgeologyia. Presentation given at International Workshop for the Establishment of a Regional Environmental Management Plan for the Clarion-Clipperton Zone in the Central Pacific 8-12 November 2010 Kingston, Jamaica.

Menot, L. Galeron, J., Saget, P., 2010. Environmental work carried out by Ifremer. ISA Workshop presentation. http://www.isa.org.jm/files/documents/EN/Workshops/2010/Pres/IFREMER.pdf Downloaded 28/3/16

Mer et Marine, 2009. Le Pourquoi Pas ? seule chance de retrouver les boites noires de l'Airbus d'Air France http://www.meretmarine.com/fr/content/le-pourquoi-pas-seule-chance-de-retrouver-les-boites-noires-de-lairbus-dair-france Downloaded March 2016.

Mero, J.L., 1965 The mineral resources of the sea. Volume 1 (Elsevier Oceanography Series)

Meylan, M.A., Dugolinsky, B.K. and Fortin, L. 1976. Bibliography and Index to Literature on Manganese Nodules (1874-1975). IDOE-NSF Manganese Nodule Technical Report No. 14 US Department of Commerce National Oceanic and Atmospheric Administration

Morgan, C., 2009. Geological Model Project Implementation. Presentation from the ISA geological model workshop December 2009, Kingston, Jamaica

Morgan C., 2011 Potential Environmental Impact of Seabed Mining – Presentation International Workshop on Environmental Management Needs for Exploration and Exploitation of Deep Seabed Minerals Fiji Islands, 29 November – 3 December 2011

Mukherjee, A,, Raichura, A.M., Natarajana, K.A. and Modak, J.M. 2004 recent developments in processing ocean manganese nodules—a critical review. Mineral Processing and Extractive Metallurgy Review. Volume 25, Issue 2,

Murray, J, and Renard, A. F., 1891, Report on Deep-Sea Deposits; Scientific Results Challenger Expedition (1891), pp. 267-276

National Geographic. DEEPSEA CHALLENGE, The Solo Journey to the Deepest Known Point in the Ocean. Accessed March 2013 at http://education.nationalgeographic.com/education/deepsea-challenge/

Natural History Museum UK, 2014, Challenger stations database, http://www.nhm.ac.uk/resources-rx/files/challenger_stns-45442.xls downloaded August 2014

NIOT (National Institute of Ocean Technology), 2008. Workshop on polymetallic nodule mining technology – current status and challenges ahead. Background Document. http://www.isa.org.jm/files/documents/EN/Workshops/Feb2008/Backgrd.pdfhttp://www.isa.org.jm/files/documents/EN/Workshops/Feb2008/Backgrd.pdf

NOAA, (U.S. Department of Commerce, National Oceanic and Atmospheric Administration) 1987 Deep Seabed Mining: Report to Congress. United States Department of Commerce, National Oceanic and Atmospheric Administration Report.

NOAA (U.S. Department of Commerce, National Oceanic and Atmospheric Administration), 1993, “Deep Seabed Mining – Report to Congress”, report related to implementation of the Deep Seabed Hard Minerals Act, 30 U.S.C. http://docs.lib.noaa.gov/noaa_documents/NOS/OCRM/Deep_Seabed_Mining_1993.pdf Downloaded 10th May 2016

NOAA, 2013a Marine Geology Data Scripps Institution of Oceanography Ferromanganese Nodule Analysis File. NGDC Data Set G00128. http://www.ngdc.noaa.gov/mgg/geology/sionar.html

NOAA 2016. Seabed Management http://www.gc.noaa.gov/gcil_seabed_management.html Downloaded 4th April 2016.

NOAA NWS (US National Oceanic and Atmospheric Administration, National Weather Service) 2015. Historical Hurricane Tracks; URL: http://coast.noaa.gov/hurricanes/?redirect=301ocm

NOAA NWS (US National Oceanic and Atmospheric Administration, National Weather Service) 2016 http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml Downloaded 24th May 2016

NORI (Nauru Ocean Resources Inc.) 2013, Site. http://www.nauruoceanresources.com/ Downloaded 7th April 2016

Novikov G.V. and Bogdanova O. Y., 2007, Transformations of Ore Minerals in Genetically Different Oceanic Ferromanganese Rocks, ISSN 0024-4902, Lithology and Mineral Resources, 2007, Vol. 42, No. 4, pp. 303–317.

Oil & Gas Financial Journal, 2012. Global use of FPSOs is growing. Accessed March 13 at http://www.ogfj.com/articles/2012/03/global-use-of-fpsos-is-growing.html

Okazaki, M., 2012 Email “RE:DORD Reserved Area Data” to Charles Morgan 12th July 2012

Olive J.-A., Behn M. D., Ito G., Buck W. R., Escartín J., Howell S. 2015, Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply, Science, Vol. 350, Issue 6258, pp. 310-313, DOI: 10.1126/science.aad0715

Ozturgut, E., Lavelle, J.W. and Erickson, B.H. 1981, Estimated discharge characteristics of a commercial nodule mining operation. Marine Mining Vol 3 (1-2)

Ozturgut, E., Trueblood, D.D. and Lawless, J. 1997, An overview of the United States’s Benthic Impact Experiment. In Proceedings of International Symposium on Environmental Studies for Deep-Sea Mining. Metal Mining Agency of Japan, Tokyo, Japan, 20-21 November 1997

Periscope Film, 2013, Deep Sea Ocean Mining - HUGHES GLOMAR EXPLORER Project Azorian 21050. https://www.youtube.com/watch?v=i5QPyuc86bI Downloaded 7th April 2016

Piper, D. Z., Cook, H. E., Gardner, J.V. 1979. Lithic and acoustic stratigraphy of the equatorial north Pacific: Domes sites A, B, and C. In Bischoff et al eds Marine Geology and Oceanography of the Pacific Manganese Nodule Province. Plenum Press

R Core Team, 2016, R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL http://www.R-project.org/. Downloaded May 2016

Radziejewska, T., Rokicka-Praxmajer, J., & Stoyanova, V. 2001. 10M BIE Revisited: Meiobenthos At the IOM BIE Site 5 Years After the Experimental Disturbance. International Society of Offshore and Polar Engineers.

Ranganathan, S. 2014. Strategically Created Treaty Conflicts and the Politics of International Law. Cambridge University Press

Rebesco M., Hernández-Molina F.J, Van Rooij, D., Wåhlin, A., 2014, Contourites and associated sediments controlled by deep-water circulation processes: State-of-the-art and future considerations. Marine Geology, 352, 111–154

Retsch, 2012. Laboratory Jaw Crushers. URL: http://search.babylon.com/?q=laboratory+crusher&babsrc=NT_ss&s=web&rlz=0&as=0&ac=0

Ruhlemann, C., Kuhn, T., Wiedicke, M., Kasten, S., Mewes, K. And Picard, A., 2011 Current status of manganese nodule exploration in the German licence area. Proceedings of the Ninth (2011) ISOPE Ocean Mining Symposium Maui, Hawaii, USA, June 19-24, 2011Scanlon, K. And Masson, D. (2000) Fe-Mn Nodule Field Indicated by GLORIA, North of the Puerto Rico Trench, Geo-Marine Letters, 1992. v. 12, p. 208-213

Saito, T., Usami, T., Yamazaki, T., Tomishima, Y., Kiyono, F. Lifting Characteristics of Manganese Nodules By Air-lift-pump On 200m Vertical Test Plant. Oceans ‘89 Proceedings, Vol 1, pg 48-53, (1989)

Schulz, H.D and Zabel, M., 2006, Marine Geochemistry 2nd Edition. Springer.

Seascape Consultants 2014, Review of implementation of the Environmental Management Plan for the Clarion-Clipperton Zone. Report to the International Seabed Authority, http://www.isa.org.jm/files/documents/EN/20Sess/LTC/CCZ-EMPRev.pdf downloaded 7th May 2016

Sen, P.K., 2010. Metals and materials from deep sea nodules: an outlook for the future. International Materials Reviews vol 55 no 6, 364-391

Shell Perdido Project website on Shell website. See http://www.shell.com/global/aboutshell/our-strategy/major-projects-2/perdido.html Downloaded September, 2012

Ship Technology, 2012. Simon Stevin Mining and Fallpipe Vessel, Belgium., http://www.ship-technology.com/projects/simon-steving/ Downloaded March 2012

Skarbo, R. R., 1975, “Recovery of metal values from manganese deep sea nodules using ammoniacal cuprous leach solutions, U S PATENT # 3,983,017

Skornyakova N.S and Andrushchenko P.F. 1964. Pacific Ferromanganese Nodules. Lithology and mineral resources, 1964, no. 5, pp. 21-36.

Skornyakova N.S., Bezrukov P.I., Murdmaa L.O., 1981 Basic patterns of distribution and composition of fields of oceanic ferromanganese nodules. Litol. and minerals, no. 5, p. 51-63.

Skornyakova, N.S, Murdmaa, L.O., Krasno, S.G. and Uspenskaya T. Yu, 1990. Ferromanganese nodules of the Southwestern Pacific: results of Soviet investigations New Zealand Journal of Geology and Geophysics vol 33 419-437

Smith, C. R., Gaines, S. D., Watling, L. Friedlander, A. M., Morgan, C., Thurnherr, A. M., Mincks, S. L., , Rogers, A., Clark, M. R., Baco-Taylor, A., Bernardino, A., De Leo, F., Dutrieux, P., Rieser, A., Kittting, J., Padilla-Gamino, J., Prescott, R. & Srsen, P. 2010. Areas of particular environmental interest (or "Protected Areas") for ecosystem based management of the Clarion-Clipperton Zone: rationale and recommendations to the International Seabed Authority. Presentation for ISA workshop for environment, November 2010 Kingston Jamiaca Presentations www.isa.org.jm Downloaded 15/5/15

Spickermann, R., 2012. Rare Earth Content of Manganese Nodules in the Lockheed Martin Clarion-Clipperton Zone Exploration Areas. Proceedings Offshore Technology Conference, Houston Texas

Stephan, D. Process Worldwide. ONGC Sets World Record on Drilling Deepest Water Depth Well. Accessed March 2013 at http://www.process-worldwide.com/management/project_management/articles/397703/

Stow, D.A.V.; Hernandez-Molina, F.J.; Llave, E.; Sayago-Gil, M.; Diaz del Rio, V.; Branson, A., 2009, "Bedform-velocity matrix: The estimation of bottom current velocity from bedform observations". Geology 37: 327–330. Bibcode:2009Geo....37..327S. doi:10.1130/g25259a.1.

Stoyanova, V. 2010. Environmental work carried out by IOM. ISA 2010 Environmental Workshop Presentations www.isa.org.jm Downloaded 15/5/15

Strauss, M. 2014 That Time The CIA And Howard Hughes Tried To Steal A Soviet Submarine. Io9 online magazine. http://io9.gizmodo.com/that-time-the-cia-and-howard-hughes-tried-to-steal-a-so-1561583789. Downloaded April 2016.

Takeda Jun'ichi, 2014. "China's Rise as a Maritime Power: Ocean Policy from Mao Zedong to Xi Jinping," Review of Island Studies, April 23, 2014, http://islandstudies.oprf-info.org/research/a00011/. Translated from "Chugoku no kaiyo seisaku," Tosho Kenkyu Journal, Vol. 2 No. 2 (April 2013), pp. 73–95; published by the OPRF Center for Island Studies.

Thiel, H, Angel, M.V., Foell, E.J., Rice, A.L. and Schriever, G. 1997. Environmental risks from large-scale ecological research in the deep sea: a desk study. European Commission Report. Contract MAS2-CT94-0086.

Tilot, V. 2006. Biodiversity and distribution of megafauna. Vol. 1: The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean; Vol. 2: Annotated photographic atlas of the echinoderms of the Clarion-Clipperton fracture zone. Paris, UNESCO/IOC, (IOC Technical Series, 69).

UNDP (United Nations Development Program), 2008, Characterizing the 21st Century First Commodity Boom: Drivers and Impact. A UNDP/ODS Working Paper by Pedro Conceição and Heloisa Marone. http://web.undp.org/developmentstudies/docs/note_on_the_commodity_boom_29_Sep_08.pdf downloaded 7th May 2016

United Nations 1970. 2749 (XXV). Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction. A/RES/25/2749. Downloaded 13/11/14 from http://www.un-documents.net/a25r2749.htm

United Nations 1979. Manganese Nodules: Dimensions and Perspectives. United Nations Ocean Economics and Technology Office. D. Reidel Publishing Company Holland ISBN 90-2770500-3

United Nations, 2014, World Economic Situations and Prospects 2014: Country classification. http://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf Downloaded 7th April 2014.

University of Virginia, 2015. United Nations Conference on the Law of the Sea (UNCLOS) III: Deepsea Miner II. http://archives.law.virginia.edu/records/mss/82-6/digital/9555 Downloaded May, 2016.

UNOETO, 1979, Manganese Nodules: Dimensions and Perspectives edited by United Nations. Ocean Economics and Technology Office.

Van Den Berg, G., and Cooke, R. Hydraulic hoisting technology for platinum mines, The South African Institute for Mining & Metallurgy, 2004

Veillette, J., Sarrazin, J., Gooday, A. J., Galéron, J., Caprais, J.-C., Vangriesheim, A., Étoulbleau, J., Christian, J. R. & Juniper, K. S. 2007. Ferromanganese nodule fauna in the Tropical North Pacific Ocean: Species richness, faunal cover and spatial distribution. Deep Sea Research Part I: Oceanographic Research Papers, 54, 1912-1935.

Volkov, I. 1979. Chemical oceanography 2. Geochemistry of bottom sediments CEP. Oceanology. Science.

von Stackelberg U. and Beiersdorf H., 1991. The formation of manganese nodules between the Clarion and Clipperton fracture zones southeast of Hawaii. Marine Geology 98, pp 411-423

Wang, Y., Li, Z. and Li, H., 2005. A new process for leaching metal values from ocean polymetallic nodules. Minerals Engineering (18) pp 1093-1098

Wiedicke-Hombach, M., Post, J. and Jarowinsky, M., 2012, Technologische und rohstoff-politiche potenziale fur die deutsche Wirtschaft. Schiff and Halen No.6 82-88.

WHOI (Woods Hole Oceanographic Institution), 2013. Underwater Vehicles, accessed March 13 at http://www.whoi.edu/main/underwater-vehicles

Yamazaki, T. 2006 Technological issues associated with commercialising cobalt-rich ferromanganese crusts deposits in the Area. Presentation for ISA workshop on Mining Cobalt-rich Ferromanganese Crusts and Polymetallic Sulphides in the Area, July 31, 2006 Kingston Jamaica

Yamazaki, T. 2008. Model mining units of the 20th century and the economies. Proceedings for MoES & ISA Workshop on Polymetallic Nodule Mining Technology 18-22. February 2008, National Institute of Ocean Technology, Chennai, India

Yamazaki, T. 2011, Impacts of up-coming deep-sea mining. in Brunn, S.D. ed Engineering Earth: the impacts of megaengineering projects. Springer Science and Business Media.

Yamazaki, T. And Kajitani, Y. 1999, Deep-sea environment and impact experiment to it. Proceedings of the Ninth International Offshore and Polar Engineering Conference. The International Society of Offshore and Polar Engineers.

Yamazaki, T., Barnett, B.G. and Suzuki, T. 1997, Optical determination of the JET deep sea sediment disturbance. In Proceedings of International Symposium on Environmental Studies for Deep-Sea Mining. Metal Mining Agency of Japan, Tokyo, Japan, 20-21 November 1997

Yubko, V., 2012. Email “RE: Yuzhmorgeologiya Exploration Data in Tongan ISA Contract Area” to Charles Morgan 18th June 2012

25 Reliance on information provided by the registrant

AMC has relied upon information provided by the registrant in preparing its findings and conclusions regarding the following aspects of modifying factors:

(i) Macroeconomic trends, data, and assumptions, and market studies as, for example, presented in Section 16;

(ii) Legal matters outside the expertise of the qualified person, such as statutory and regulatory interpretations affecting the Project as, for example, described in Section 3 and 17;

(iii) Environmental matters outside the expertise of the qualified person as, for example, described in Section 17;

(iv) Governmental factors outside the expertise of the qualified person as, for example, described in Section 3, 17.

Date

The effective date of this Technical Report Summary is 31 December 2020.

Signature

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PRELIMINARY -- SUBJECT TO COMPLETION

Proxy Card for Sustainable Opportunities Acquisition Corp.

Extraordinary General Meeting
609 Main Street
Houston, Texas 77002

EXTRAORDINARY GENERAL MEETING
OF SHAREHOLDERS OF SUSTAINABLE OPPORTUNITIES ACQUISITION CORP.
YOUR VOTE IS IMPORTANT

THIS PROXY IS SOLICITED BY THE BOARD OF DIRECTORS
FOR THE EXTRAORDINARY GENERAL MEETING OF SHAREHOLDERS
TO BE HELD ON [•], 2021.

PROXY CARD

The undersigned, revoking any previous proxies relating to these shares, hereby acknowledges receipt of the Notice and Proxy Statement, dated [ ], 2021, in connection with the Extraordinary General Meeting of Shareholders (the "Extraordinary General Meeting") to be held at 10:30 a.m. Central Time on [ ], 2021, at the offices of Kirkland & Ellis LLP located at 609 Main Street, Houston, TX 77002, and hereby appoints Scott Leonard, David Quiram and Gina Stryker, and each of them (with full power to act alone), the attorneys and proxies of the undersigned, with power of substitution to each, to vote all ordinary shares of Sustainable Opportunities Acquisition Corp. ("SOAC" and after the Continuance, as defined below, "TMC") registered in the name provided, which the undersigned is entitled to vote at the Extraordinary General Meeting, and at any adjournments thereof, with all the powers the undersigned would have if personally present. Without limiting the general authorization hereby given, said proxies are, and each of them is, instructed to vote or act as follows on the proposals set forth in the accompanying proxy statement/prospectus.

THIS PROXY, WHEN EXECUTED, WILL BE VOTED IN THE MANNER DIRECTED HEREIN. IF NO DIRECTION IS MADE, THIS PROXY WILL BE VOTED "FOR" PROPOSALS 1 THROUGH 7.

(Continued and to be marked, dated and signed on reverse side)

SEE REVERSE SIDE

THE BOARD OF DIRECTORS RECOMMENDS A VOTE "FOR" PROPOSALS 1, 2, 3, 4A, 4B, 4C, 4D, 4E, 4F, 5, 6 AND 7.

Please mark vote as indicated in this example [X]

Proposal No. 1 — The Continuance Proposal — to consider and vote upon a proposal by special resolution to approve the migration and continuance of SOAC from the Cayman Islands to British Columbia, pursuant to Part XII of the Cayman Islands Companies Act (as Revised) and Part 9, Division 8 of the Business Corporations Act (British Columbia) (the "BCBCA") (such continuance, the "Continuance").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Proposal No. 2 — The Business Combination Proposal — to consider and vote upon a proposal by ordinary resolution to approve the Business Combination Agreement, dated as of March 4, 2021 (as amended or supplemented from time to time, the "Business Combination Agreement"), by and among SOAC, 1291924 B.C. Unlimited Liability Company, an unlimited liability company existing under the laws of British Columbia, Canada ("NewCo Sub") and DeepGreen Metals Inc., a company existing under the laws of British Columbia, Canada ("DeepGreen"), and the transactions contemplated by the Business Combination Agreement (collectively, the "Business Combination"). Pursuant to the Business Combination Agreement, among other things, SOAC will acquire all of the issued and outstanding shares in the capital of DeepGreen (the "DeepGreen Common Shares") from DeepGreen Shareholders in exchange for SOAC Common Shares and DeepGreen Earnout Shares by means of an Arrangement under the BCBCA (the "Share Exchange"); DeepGreen will become a wholly-owned subsidiary of TMC; and DeepGreen and NewCo Sub will amalgamate to continue as one company (the "Surviving Company"), as described in more detail in the accompanying proxy statement/prospectus. SOAC refers to this proposal as the "Business Combination Proposal." All defined terms not specifically defined herein are defined in the accompanying proxy statement/prospectus. A copy of the Business Combination Proposal is attached to the accompanying proxy statement/prospectus as Annex A.

FOR ☐ AGAINST ☐ ABSTAIN ☐

Proposal No. 3 — The Charter Proposal — to consider and vote upon the approval by special resolution of the amendment and restatement of the Existing Governing Documents (as defined herein) in their entirety by the notice and articles of association of TMC the metals company Inc. (the "TMC Articles"), including the change in authorized share capital and change of name of SOAC to "TMC the metals company Inc." in connection with the Business Combination. SOAC refers to this as the "Charter Proposal."

FOR ☐ AGAINST ☐ ABSTAIN ☐

Proposal No. 4 — The Organizational Documents Proposals — to consider and vote upon, on a non-binding basis, certain governance provisions in the TMC Notice and Articles (collectively, the "Organizational Documents Proposals), to approve the following material differences between the current amended and restated memorandum and articles of association of SOAC (the "Existing Governing Documents") and the TMC Notice and Articles:

Organizational Documents Proposal 4A — the establishment of the authorized capital of TMC to consist of (i) an unlimited number of common shares, (ii) an unlimited number of preferred shares, issuable in series, and (iii) the TMC Special Shares, in each case, without par value (this proposal is referred to herein as "Organizational Documents Proposal 4A").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Organizational Documents Proposal 4B — the declassification of the board of directors with the result being that each director will be elected on an annual basis (this proposal is referred to herein as "Organizational Documents Proposal 4B").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Organizational Documents Proposal 4C — the reduction of the requisite quorum for a meeting of shareholders from a majority to at least two shareholders representing no less than one-third ($33^{1/3}$%) of the shares entitled to vote at such meeting (this proposal is referred to herein as "Organizational Documents Proposal 4C").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Organizational Documents Proposal 4D — the inclusion of an advance notice provision that requires a shareholder to provide notice to TMC in advance of a meeting of shareholders should such shareholder wish to nominate a person for election to the board of directors (this proposal is referred to herein as "Organizational Documents Proposal 4D").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Organizational Documents Proposal 4E — the inclusion of a forum selection provision whereby, subject to limited exceptions, or unless TMC consents in writing to the selection of an alternative forum, the Supreme Court of the Province of British Columbia, Canada, and the appellate courts therefrom, will be the sole and exclusive forum for certain shareholder litigation matters (this proposal is referred to herein as "Organizational Documents Proposal 4E").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Organizational Documents Proposal 4F — certain other changes, including the changes in the rights and restrictions attached to the Class B ordinary shares, and the deletion of the provisions relating to the initial public offering, the Sponsors, the initial business combination and other related matters (this proposal is referred to herein as "Organizational Documents Proposal 4F").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Proposal No. 5 — The NYSE Proposal — to consider and vote upon a proposal by ordinary resolution to approve, for purposes of complying with the provisions of the New York Stock Exchange ("NYSE") Listing Rule 312.03, the issuance of TMC Common Shares (as defined in the accompanying proxy statement/prospectus), and securities convertible into or exchangeable for TMC Common Shares, in connection with the Business Combination and the PIPE Investment (the "NYSE Proposal").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Proposal No. 6 — The Incentive Award Plan Proposal — to consider and vote upon the approval by ordinary resolution of the TMC Incentive Plan (as defined in the accompanying proxy statement/prospectus). SOAC refers to this as the "Incentive Award Plan Proposal." A copy of the Incentive Award Plan Proposal is attached to an amendment to the accompanying proxy statement/prospectus as Annex D.

FOR ☐ AGAINST ☐ ABSTAIN ☐

Proposal No. 7 — The Adjournment Proposal — to consider and vote upon a proposal by ordinary resolution to approve the adjournment of the Extraordinary General Meeting to a later date or dates, if necessary, to permit further solicitation and vote of proxies in the event that there are insufficient votes for the approval of one or more proposals at the Extraordinary General Meeting (the "Adjournment Proposal").

FOR ☐ AGAINST ☐ ABSTAIN ☐

Date:_____

_____
(Signature)

_____
(Signature if held Jointly)

Signature should agree with name printed hereon. If stock is held in the name of more than one person, EACH joint owner should sign. Executors, administrators, trustees, guardians and attorneys should indicate the capacity in which they sign. Attorneys should submit powers of attorney.

PLEASE SIGN, DATE AND RETURN THE PROXY IN THE ENVELOPE ENCLOSED TO CONTINENTAL STOCK TRANSFER & TRUST COMPANY. THIS PROXY WILL BE VOTED IN THE MANNER DIRECTED HEREIN BY THE UNDERSIGNED SHAREHOLDER. IF NO DIRECTION IS MADE, THIS PROXY WILL BE TREATED AS AN ABSTENTION AND WILL HAVE NO EFFECT ON ANY OF THE PROPOSALS. THIS PROXY WILL REVOKE ALL PRIOR PROXIES SIGNED BY YOU.

Exhibit 99.2

CONSENT TO REFERENCE IN PROXY STATEMENT/
PROSPECTUS

May 26, 2021

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201

Sustainable Opportunities Acquisition Corp. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus included in such Registration Statement as a future member of the board of directors of the Company (to be renamed TMC the metals company Inc.), such appointment to commence immediately after the effective time of the arrangement described in the proxy statement/prospectus.

Sincerely,

/s/ Andrew Hall
Andrew Hall

Exhibit 99.3

CONSENT TO REFERENCE IN PROXY STATEMENT/
PROSPECTUS

May 26, 2021

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201

Sustainable Opportunities Acquisition Corp. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus included in such Registration Statement as a future member of the board of directors of the Company (to be renamed TMC the metals company Inc.), such appointment to commence immediately after the effective time of the arrangement described in the proxy statement/prospectus.

Sincerely,

/s/ Eric Branderiz
Eric Branderiz

Exhibit 99.4

CONSENT TO REFERENCE IN PROXY STATEMENT/
PROSPECTUS

May 26, 2021

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201

Sustainable Opportunities Acquisition Corp. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus included in such Registration Statement as a future member of the board of directors of the Company (to be renamed TMC the metals company Inc.), such appointment to commence immediately after the effective time of the arrangement described in the proxy statement/prospectus.

Sincerely,

/s/ Sheila Khama
Sheila Khama

Exhibit 99.5

CONSENT TO REFERENCE IN PROXY STATEMENT/
PROSPECTUS

May 26, 2021

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201

Sustainable Opportunities Acquisition Corp. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus included in such Registration Statement as a future member of the board of directors of the Company (to be renamed TMC the metals company Inc.), such appointment to commence September 1, 2021.

Sincerely,

/s/ Riva Krut

Riva Krut

Exhibit 99.6

CONSENT TO REFERENCE IN PROXY STATEMENT/
PROSPECTUS

May 26, 2021

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201

Sustainable Opportunities Acquisition Corp. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus included in such Registration Statement as a future member of the board of directors of the Company (to be renamed TMC the metals company Inc.), such appointment to commence immediately after the effective time of the arrangement described in the proxy statement/prospectus.

Sincerely,

/s/ Andrei Karkar
Andrei Karkar

Exhibit 99.7

CONSENT TO REFERENCE IN PROXY STATEMENT/
PROSPECTUS

May 26, 2021

Sustainable Opportunities Acquisition Corp.
1601 Bryan Street, Suite 4141
Dallas, Texas 75201

Sustainable Opportunities Acquisition Corp. (the "Company") is filing a Registration Statement on Form S-4 with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus included in such Registration Statement as a future member of the board of directors of the Company (to be renamed TMC the metals company Inc.), such appointment to commence immediately after the effective time of the arrangement described in the proxy statement/prospectus.

Sincerely,

/s/ Christian Madsbjerg
Christian Madsbjerg