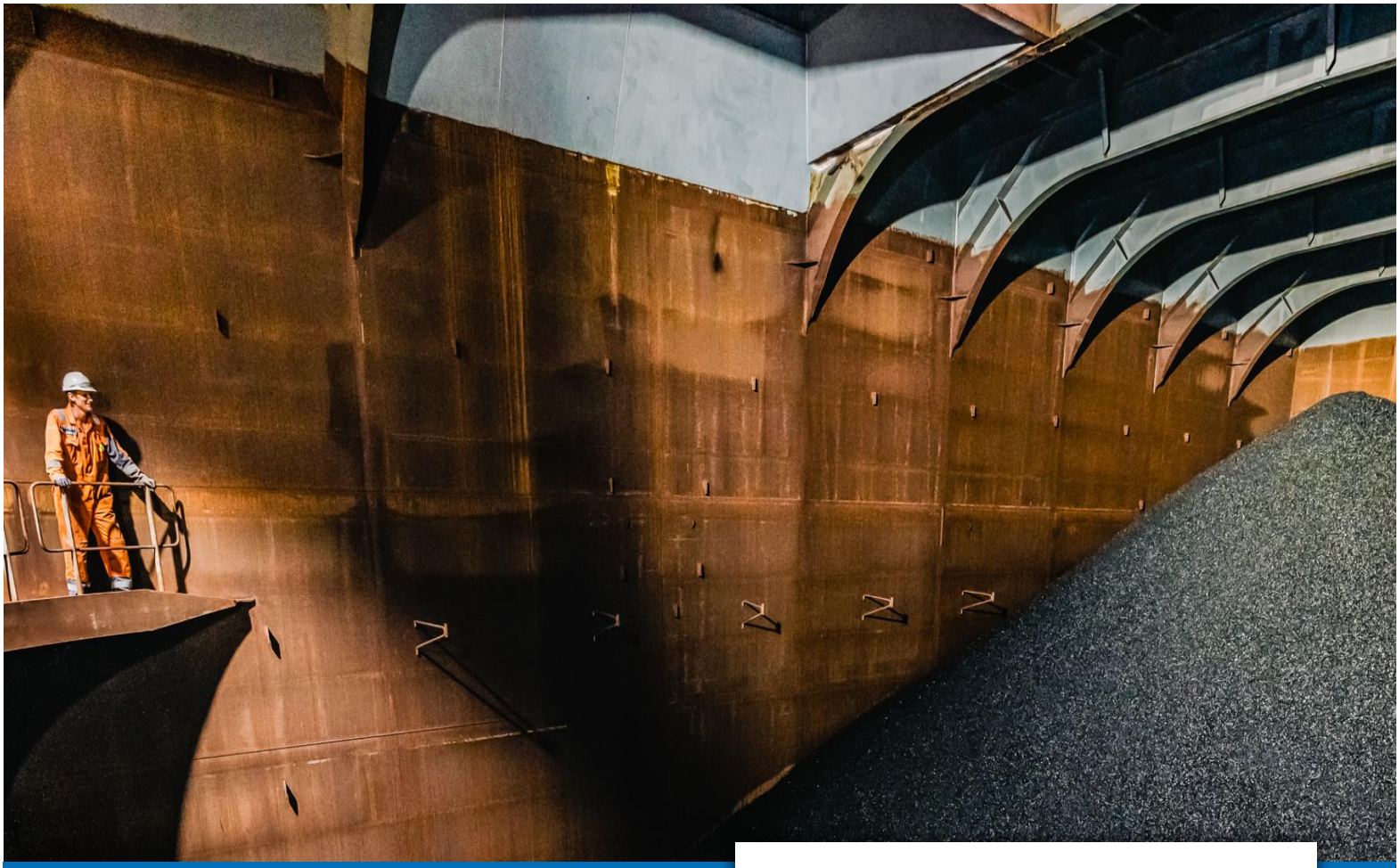

NAURU OCEAN RESOURCES INC.

PRIZMA

SCOPING REPORT AND ENGAGEMENT RECORD FOR THE SOCIAL IMPACT ASSESSMENT FOR THE NORI-D POLYMETALLIC NODULE COLLECTION PROJECT, 23 MARCH 2023

Prepared for Nauru Ocean Resources Inc. (NORI) by Prizma LLC

Disclaimer: This document was prepared exclusively for Nauru Ocean Resources Inc. (NORI) by Prizma LLC (Prizma). The quality of information, conclusions, and estimates contained herein are consistent with the level of effort involved in Prizma's services and based on: a) information available at the time of preparation, b) data supplied by outside sources, and c) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by the above client subject to the terms and conditions of its contract with Prizma. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

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I. About this Document

This document[1] provides a record of the scoping process applied to plan a Social Impact Assessment (SIA) study for the NORI-D Polymetallic Nodule Collection Project (the Project). The document includes a description of the SIA scoping process (Section 2) and provides a summary of the results of the scoping consultation (Section 3), and the following attachments:

- Terms of References (TOR) for the SIA study (Annex 1)
- Prizma's team completing the Scoping Report and Engagement Record, and TOR (Annex 2)
- Summary of two events on the sidelines of the Indaba Mining in Cape Town (Annex 3)
- Segmented listing of comments received and responses (Annex 4)
- Original submissions received (Annex 5)
- SIA Scoping Document (Annex 6)

Additional engagement activities conducted include two seminar-style events to engage with interested stakeholders on the sidelines of the Mining Indaba in Cape Town, on 7 February 2023 (see Annex 5).

Future engagements planned include the following:

- Webinar to present the Scoping Report and TOR
- Visits the meetings of the International Seabed Authority (ISA), including March, July and October 2023
- Visits to the Pacific islands of Nauru and Fiji, in April and/or May 2023
- Attend and present at the annual conference of the International Association for Impact Assessment (IAIA), in May 2023, in Malaysia.

This document was prepared by Prizma LLC (Prizma), an independent environmental and social advisory practice, on behalf of Nauru Ocean Resources Inc. (NORI). This document is expected to be published (disclosed) on TMC/NORI's website. The biographies of contributors to this Scoping Document and Record of Engagement, and TOR are shown in Annex 2.

[1] https://metals.co/wp-content/uploads/2023/03/NORI-D-SIA-Scoping-Report-and-Engagement-Record-Combined-20230323.pdf

II. About the SIA Scoping Process

A. General Approach

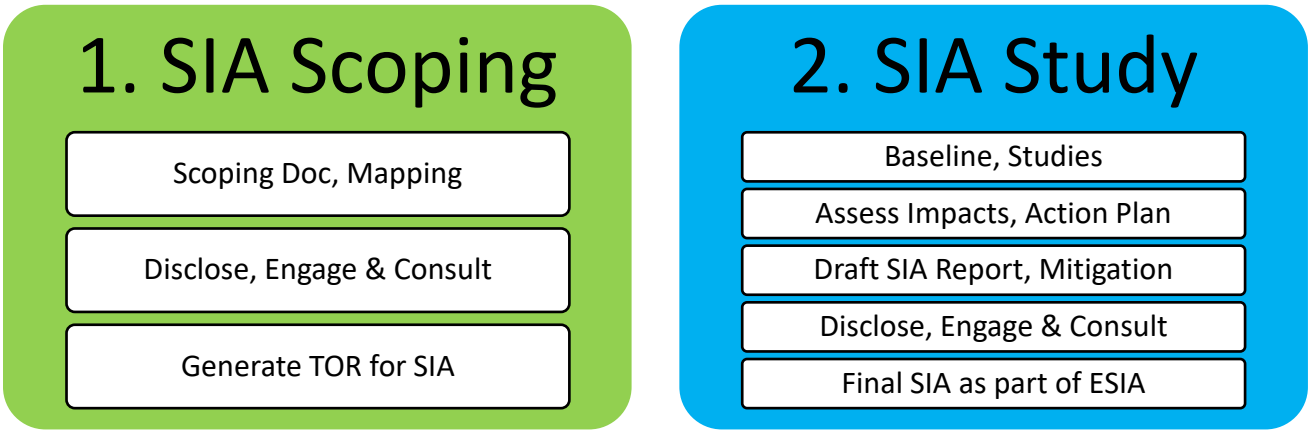
The NORI-D SIA will be the first such study for a deep-sea mining (DSM) project in international waters. The ISA's exploitation regulatory regime is not finalized. Prizma reviewed ISA's draft exploitation regulatory regime, utilized published guidance available from organizations such as the International Association for Impact Assessment (IAIA), applied the IFC Performance Standards Performance Standards on Environmental and Social Sustainability (IFC PS), and considered Good International Industry Practice (GIIP). These sources identified the need to conduct an initial screening of the project, scope the SIA process, and enable stakeholder engagement early in the process, all of which was adopted by Prizma.

Based on this approach, Prizma segmenting the SIA process for NORI-D into two parts or phases. These are listed below:

1. The SIA Scoping phase
2. The SIA studies

This segmented approach and key components of each phase are shown in Figure 1.

Figure 1: Prizma adopted a two-phased approach to NORI-D's SIA process



Source: Prizma. Note: Doc -Document, ESIA – Environmental and Social Impact Assessment, SIA – Social Impact Assessment, TOR – Terms of Reference

Following an informal presentation entitled "What does an SIA for a Deep-Sea Mining project look like?" and discussions with interested ESIA practitioners on 5 May 2022, on the sidelines of IAIA's annual conference held in Vancouver, and consulting selected scoping studies from land-based mining, off-shore oil and gas, and offshore wind power projects, Prizma drafted the Project's SIA Scoping Document.

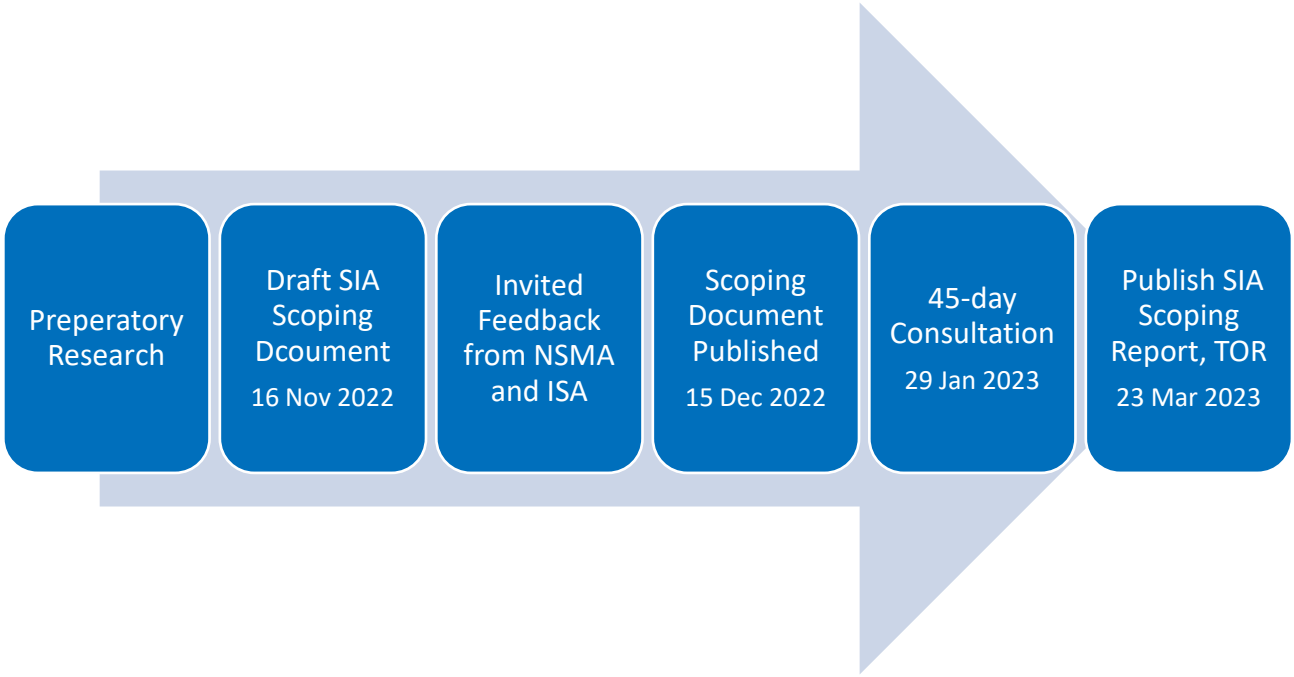
B. Disclosure and Notification

The general timeline of NORI-D's SIA scoping process is illustrated in Figure 2. On 16 November 2022, the Nauru Ocean Resources Inc. (NORI) shared the draft SIA Scoping Document with the ISA Secretary General, requesting for the document to be further shared with ISA's Legal and Technical Commission, for feedback. The draft SIA Scoping Document was also shared with the Nauru Seabed Minerals Authority (NSMA) for information and feedback.

The SIA Scoping Document was web-published (see Annex 6) for public comments on 15 December 2022. The 45-day long consultation period following the publication of the SIA Scoping Document ended on 29 January 2023. The availability of the SIA Scoping Document and the public consultation period was advertised via social media postings by Prizma and TMC/NORI, as well as direct email campaigns to stakeholders on NOR's database.

In addition, NORI and Prizma planned and delivered two webinars on 12 January 2023, which were recorded[2]. The invites were also distributed via social media on 21 December 2022, and during the following weeks. Examples of social media posts highlighting the availability of the SIA Scoping Document, disclosure period, and webinars are shown in Figures 3 and 4.

Figure 2: General timeline of NORI-D's SIA scoping process



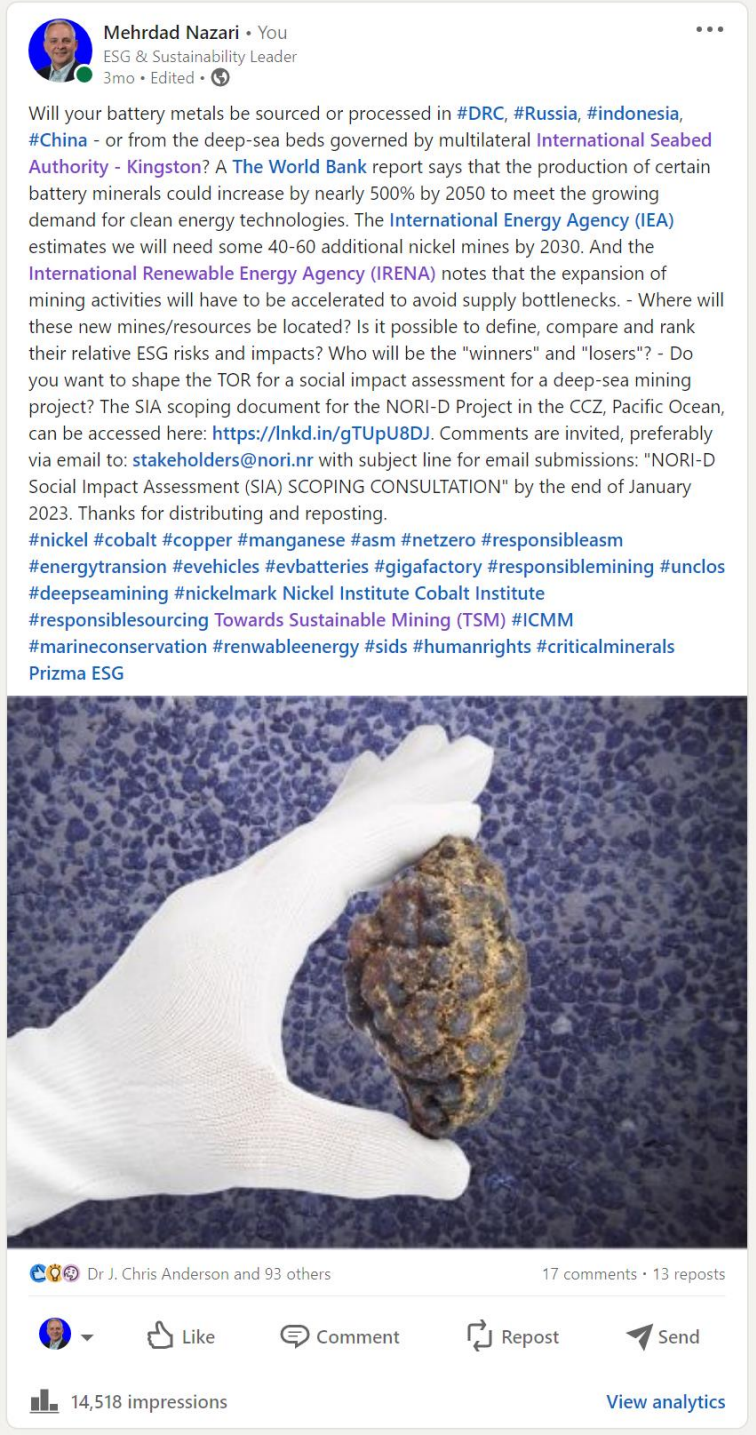
Source: Prizma. Note: SIA – Social Impact Assessment, ISA – International Seabed Authority, NSMA - Nauru Seabed Minerals Authority

[2] Webinar recordings: https://tinyurl.com/mtt3vm6m and https://tinyurl.com/4xxh95cp

C. Events in Cape Town

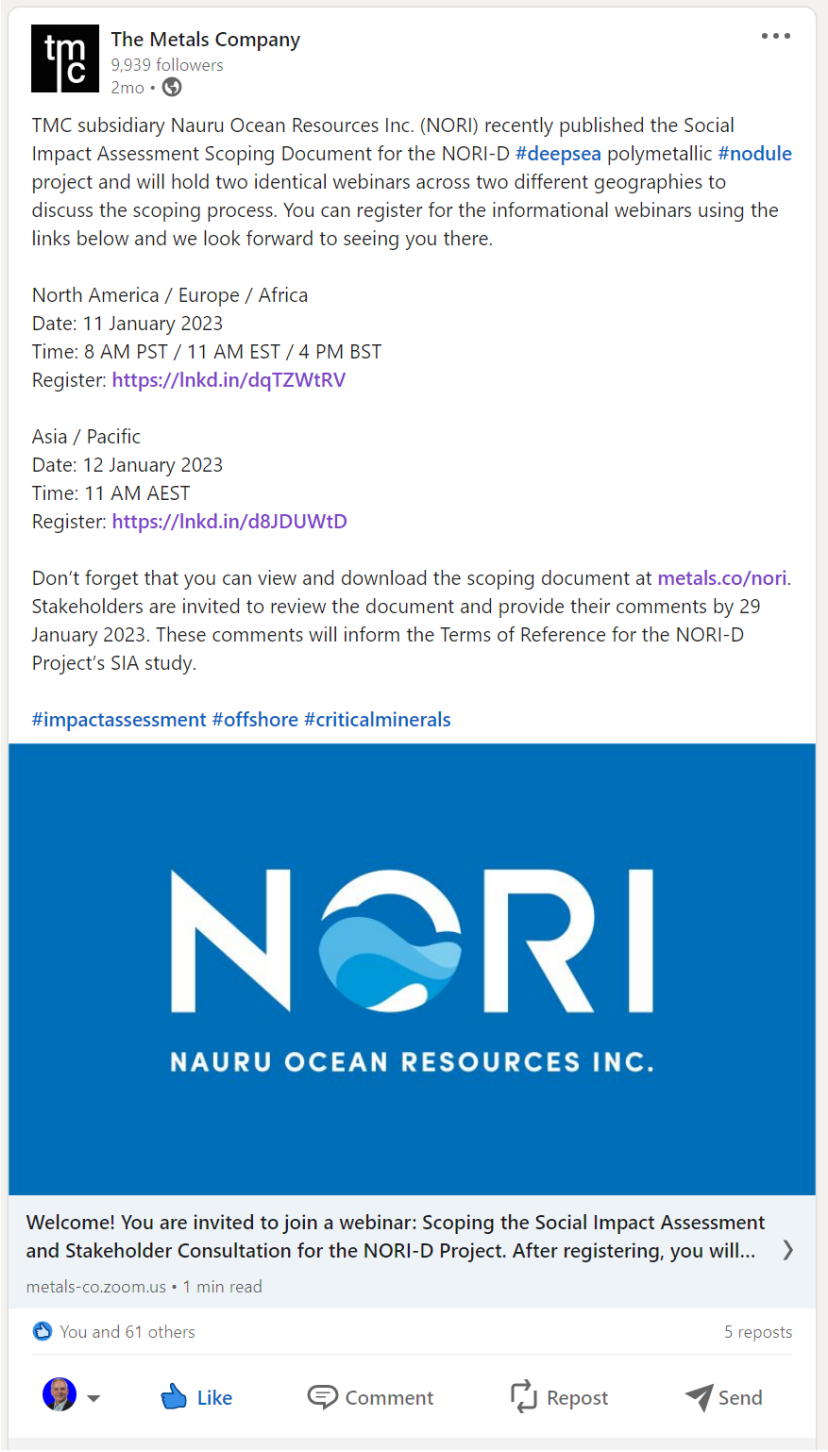
On 7 February 2023, NORI and Prizma hosted and presented at two back-to-back, seminar-style presentations on the sideline of the Mining Indaba 2023, which was being held in Cape Town, South Africa. The first webinar was also attended by Ms. Sheila Khama, a member of TMC's board of directors, and chairs the company's sustainability and innovation committee. The four-day Indaba, held from 6-9 February 2023, welcomed more than 7,800 delegates from over 100 countries. A total of 31 individuals had registered online to attend NORI's events, and a total of 12 individuals participated.

Figure 3: A social media post about the SIA Scoping Document (over 14,000 views)



Source: Prizma, accessed 16 March 2023

Figure 4: Example of a social media posts about the SIA Scoping Document and planned webinars



Source: TMC, accessed 16 March 2023

III. Summary of Consultation Results

A. Submissions Received

On 12 January 2023, NORI hosted two webinars to enable and facilitate participation by interested stakeholders. The first webinar, targeting the North America, Europe, and Africa, attracted 146 registrants, 86 participants, and approximately 22 questions/comments. The second webinar, arranged to ease participation from the Australasia time-zones, attracted 54 registrants, 31 participants, and approximately 20 questions/comments. The participants are not identified, and their comments and questions are not attributed.

During the 45-day consultation period, a total of seven written submissions comprising 238 comments were recorded. Those who approved the disclosure of their submissions include the Ocean Foundation, the Pew Charitable Trust, and the Deep Ocean Stewardship Initiative, as well as Ms. Olga Mironenko (Environmental Scientist), Dr. Rahul Sharma (retired Chief Scientist, CSIR-National Institute of Oceanography in Goa, India), and social performance practitioners, Ms. Helen Russell (UK), and Mr. Luc Zandvliet, Canada.

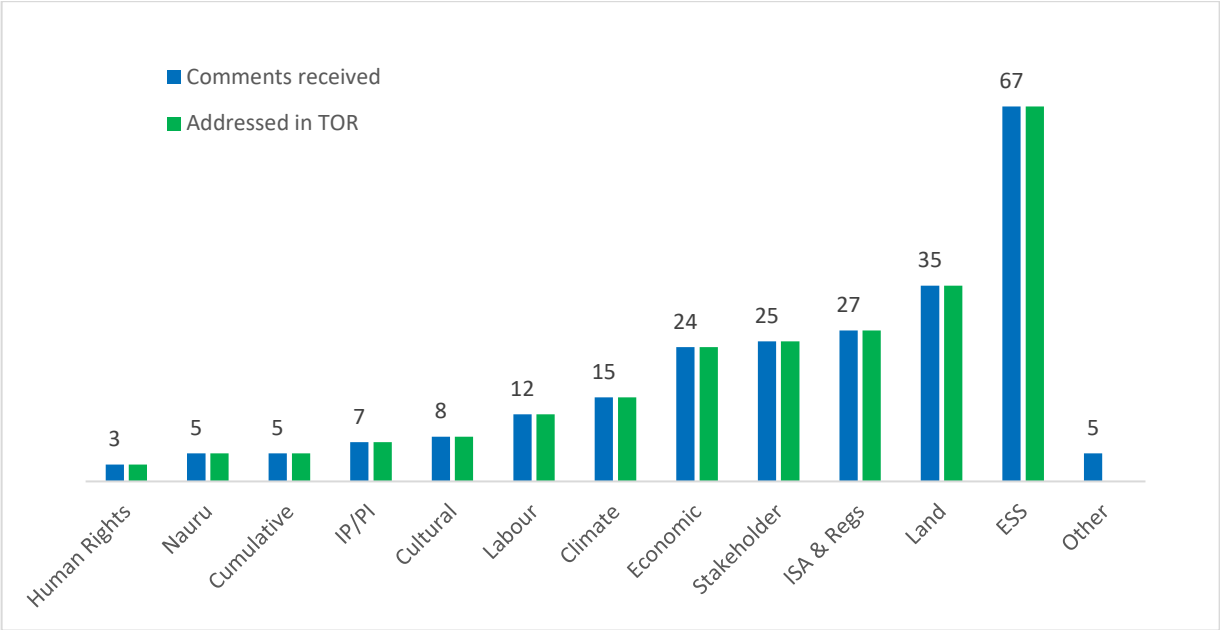
In addition, Prizma received valuable feedback from discussions following presentations at two seminars on 7 February 2023, on the sidelines of the Mining Indaba Cape Town (no count of comments). The participants of the seminars are not identified in the Scoping Report, and their comments and questions are not attributed.

No formal feedback or guidance has been provided by the ISA Secretariat or Legal and Technical Commission on NORI-D's draft or web-published SIA Scoping Document, or topics or approaches to be included in the TOR.

B. Engagements at Mining Indaba

The events and discussions held during the sidelines of the Mining Indaba conference in Cape Town, which occurred after the closing of the consultation period for the SIA Scoping Document, are not included in the statistics noted above. However, an anonymized summary of the discussions at the events are presented in Annex 3, and key comments are summarized further below. NORI and Prizma are planning additional in-person engagement and consultation events, including during the next ISA meeting in March 2023, and visits to the Pacific islands of Nauru and Fiji, the results of which may add additional activities for the SIA stage, and will form part of the Stakeholder Engagement Record to be annexed to the SIA study.

Figure 5: Seven written submissions containing 238 comments received during SIA scoping



Source: Prizma

C. Number of Comments

As illustrated in Figure 5, Prizma and/or NORI received approximately 238 comments and questions. Annex 3 contains these collated and segmented comments, along with Prizma's responses and actions identified for the TOR. Prizma notes that numerous comments could have been allocated to one or more other topics, so an element of judgment was applied by Prizma during the segmentation process.

D. Relevant Comments

Overall, Prizma deemed 233 (98%) of the 238 comments received during the scoping period to be relevant to the SIA scoping process, generating the TOR, and/or the planned E/SIA for the NORI-D Project. All 234 (or 100%) of the relevant comments received were able to be incorporated or addressed in the TOR. A summary of comments by category is provided further below.

E. Other Comments

Prizma deemed five comments (2% of total) focused on, for example, TMC's listing, dividend distribution, or marketing services not to be relevant to the E/SIA and/or TOR. All comments received are included in the records.

F. Comments on ESS

The most numerous comments received focused on ecological aspects, including diverse ecosystem services (ESS). The comments covered diverse environmental topics, inter alia, biodiversity, sediment plumes, fisheries, adaptive

management, thresholds and uncertainties, the designated Areas of Particular Environmental Interest, waste and tailings, comparing DSM with other marine-based developments, and closure/long terms impacts.

In response, Prizma noted that most of the topics or concerns raised are expected to be addressed in by the environmental impact assessment studies (such as impacts related to noise, sound, plumes, biodiversity, carbon sequestration), and some may potentially identify related social effects, such as those linked to climate change, livelihood, or culture. Prizma included numerous headings related to the comments received in the TOR, for example, fisheries, marine traffic, tourism, marine scientific research, pharmaceutical, biomaterials, sociocultural uses, Climate Change, thresholds, uncertainty, and glossary (to define terms used and/or explain others not used, such as “tailings”).

G. Comments on Land-related Topics

Land-related topics attracted the next most numerous comments. These include concerns about unevenly comparing and contrasting land-based versus deep-sea mining, DSM not offsetting or terminating land-based mines and/or may result in their performance to deteriorate further, more information requested about waste and tailings, the use of the perceived “land-based” IFC Performance Standards to a DSM Project, lack of details and risk analysis about land-based infrastructure and processing facilities, wastes and tailings, and more analysis about land-based producing states.

In response, Prizma highlighted that the IFC PSs can be applied to marine-based project, included need to provide comparison table(s) with other offshore developments (such as oil and gas), include proponent’s corporate polices and commitments (to also show approach and/or standards to be applied to future, land-based facilities), and numerous headings to cover topics related to waste, “tailings”, and land-based producing states.

H. Comments about ISA and Regulatory Aspects

The comments relating to ISA and DSM regulatory framework also attracted numerous comments. These focused on the still evolving regulatory regime, actions required by the ISA, the need to consider the International Maritime Organisation (IMO) and other requirements, ISA’s institutional structure and decision making, lack of support for DSM by several Pacific Island States, questions about moratorium and related legal aspects, allegations about TMC’s corporate behavior, various aspects related to benefit sharing, need to further consider Common Heritage of Humankind (CHH), the need to consider SIA experiences from other sectors, checking on availability of data through ISA’s DeepData, integrating uncertainty, and the impact on vulnerable developing land-based producer states.

In response, Prizma addressed each comment, and included numerous headings or topics to be covered to the TOR, for example, regulatory (to include more details about ISA, IMO, context, corporate polices), list supporting and opposing PSIDS (moratorim), expand on CHH concept, labour, emergency response planning, and vulnerable land-based producer states.

I. Comments about Stakeholders

The topic stakeholders attracted numerous comments, including comments that the SIA scoping document was "uneven", "unbalanced" or "pro DSM". During the first webinar, Prizma was notified that the zoom function allowing anonymous contributions was not enabled. NORI was commended for recognizing any interested party as its stakeholder, the challenge of engaging "the community" was noted, more and broader outreach to youth, future generations, and others was encouraged, and highlighted that different stakeholders attach different values to various aspects of the Project. There were requests to highlight opposition to DSM by certain PSIDS, such as Palau, Fiji, Federated States of Micronesia, and Samoa.

In response, Prizma address each comment received, enabled the anonymous chat/commenting function for the second zoom webinar, and added numerous headings or topics to be detailed in the SIA. Prizma plans numerous addition engagements, including during planned visits to ISA in Jamaica (including planned engagement event on 28 March 2023), and the Pacific Islands of Nauru (Sponsoring State) and Fiji (presence of numerous intergovernmental organizations and other stakeholders), and incorporating youth engagement in that outreach. The developed of dedicated stakeholder engagement and/or public consultation plan is also planned for SIA phase.

J. Comments on Economic Topics

The comments on economic aspects focused on uncertainties and use of assumptions about the economics of DSM, uncertainties about project benefits, such as royalty, taxation, and benefit distribution, need for more details about NORI and its parent company, technical details about the nodules, forecast of demand for metals, alternatives, and potential impacts on land-based producers.

In response, Prizma noted common approach to rely on published (filed) technical reports (which state economic assumptions), the need to include updated data from ISA and proponent, as available, and heading allowing adding more details about nodules, justification of alternatives considered (or not considered), information about demand forecasts, discussion of potential impacts on land-based producer states (relying on Lapteva study, and not assessing impacts on individual land-based mining operations).

K. Comments about Climate

The topic climate attracted approximately 15 comments, some of which also relate to ESS. These included requests to quantify NORI-D greenhouse gas emissions (GHGs), using published life cycle assessment (LCA) data, include transport and other Scope 3-type GHG footprint, avoid GHG offsets, and concerns about disruption of the oceans' carbon sequestration through DSM activities.

Prizma responded to each comment, including noting that several of these issues are expected to be addressed by the EIA team, and added several relevant headings and sections. These include, inter alia, Climate Change, carbon sequestration, GHG, and LCA.

L. Comments about Labour

Approximately eleven comments were categorized as labour. These focused on risks at undefined land-based infrastructure, working and safety conditions for ship-based crews, occupational health and safety statistics, child labour, and jobs created.

In addition to providing responses to each comment, Prizma added topics such as employment, labour, gender, corporate policies, social due diligence, and applicable standards (to include topics like IFC PS2 on core International Labor Organisation's core labour standards, and IMO which provides guidance to safety at sea, and other relevant topics).

M. Comments about Culture

The comments on culture, highlighting connection of Pacific Islanders to the oceans, noted concerns about risks of losing that culture and traditional knowledge, loss of Common Heritage of Humankind, and need to consider Underwater Cultural Heritage.

Prizma commented on each item raised by stakeholders, and included numerous relevant headings or topics so that they can be covered in the SIA. Examples include valued social components, traditional knowledge, migratory marine species, underwater cultural heritage, and CHH. Also, Prizma plans in-person visits to and engagement opportunities with stakeholders on the Pacific islands of Nauru and Fiji in April and/or May 2023.

N. Comments about IP/PIs

Seven comments were related to Indigenous Peoples (IP) and/or Pacific Islanders (PI), highlighting their connection to oceans and its environs, that this relationship transcends the [scientific] concept of distance, the need to consider indirect impacts, also impacts on IPs potentially affected by land-based facilities, and suggestion to actively seek out indigenous voices, and not simply rely on their representation through Member States at the ISA.

Prizma addressed every comment received and added numerous headings or topics to the TOR so that the issues identified by stakeholders can be analyzed and addressed in the SIA. Examples of relevant topics or headings added to the TOR include valued social components, traditional knowledge, migratory marine species, underwater cultural heritage, and CHH. Also, Prizma plans in-person visits to and engagement opportunities with stakeholders on the Pacific islands of Nauru and Fiji in April and/or May 2023.

O. Comments about CIA

Five comments focused on cumulative impact assessment (CIA). They noted the need to consider cumulative effects from multiple mining contractors, proposed adding ecosystem services, marine genetic resources, biodiversity, inquired how these can be monitored, cumulative impacts from land-based facilities, and recommended extending the temporal scope for the CIA to millennia.

Prizma responded to each comment, and added numerous related headings or topics to the TOR. Examples include migratory marine species, Climate Change, benefits for humankind (including, pharmaceutical, etc.), and will describe and justify the temporal boundaries of the CIA.

P. Comments about Nauru

Five comments focused on Nauru, an ISA Member and Sponsor of NORI. They raised concerns about risks of legal liability, the island's low ranking under ISA's benefit distribution model, questions about NORI's capacity building program, and how Nauru and neighboring states might benefit from the Project.

In response, Prizma provided a response and added several headings or topics to the TOR. These include a brief note that the ISA sought an advisory opinion from the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea on this topic, which will be summarized in the SIA. Other headings or topics added include the benefit sharing model (including updating revenues, distribution, taxation information, etc.), as updated, decided and available, and the social investment of NORI in Nauru.

Q. Comments about Human Rights

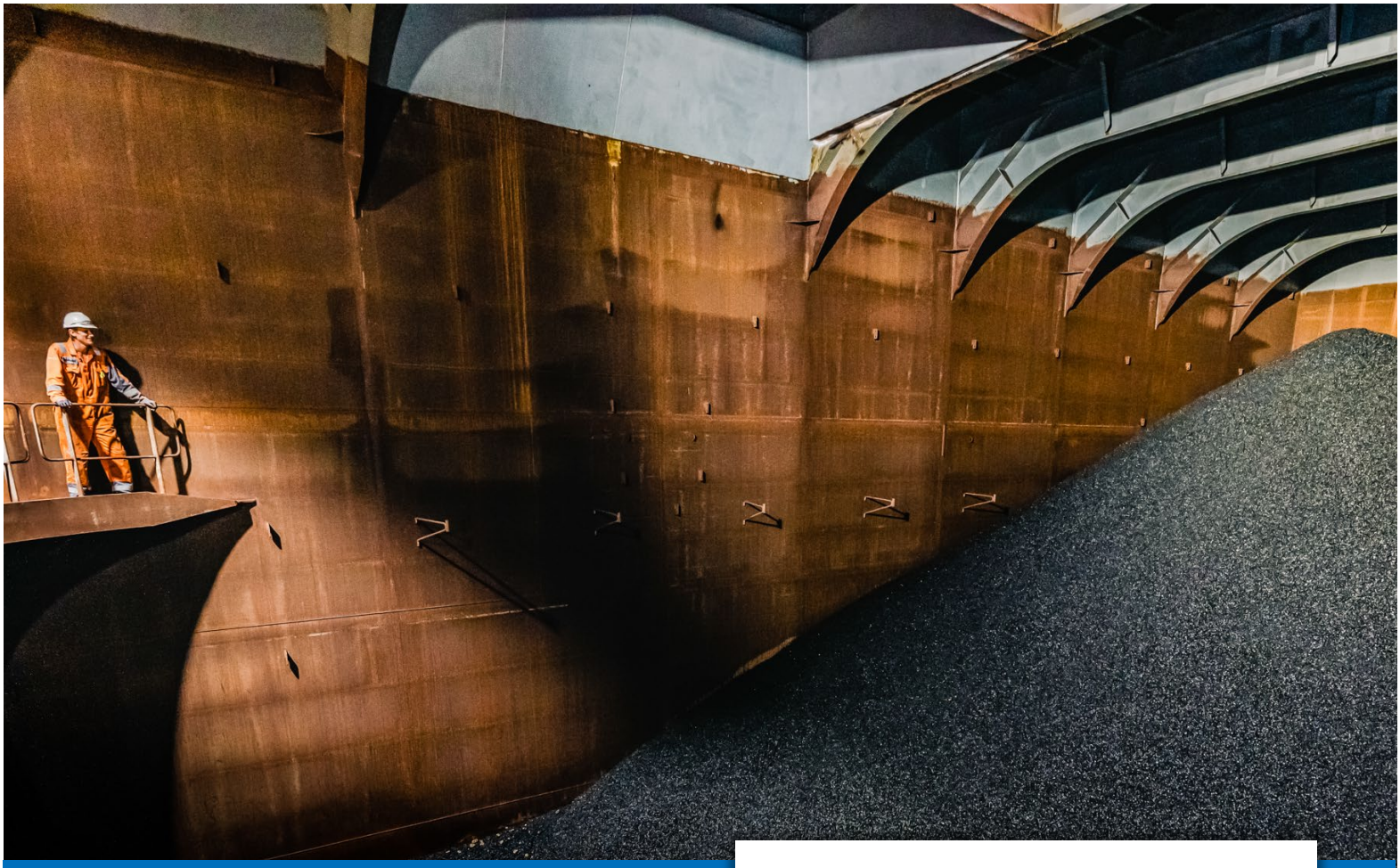
Three comments specifically noted human rights. The comments suggested that the SIA should consider a human rights lens or chapter, identifying salient issues, adding a reference to the United Nations Guiding Principles on Human Rights, and describe NORI's human-rights based principles to decision making.

Prizma notes that Human Rights are cross-cutting theme, present through most – if not all - of the previously mentioned categories of comments. The topic of Human Rights was also added to the TOR, and NORI was advised to develop relevant corporate policies.

R. Comments from Indaba Side Events

During the presentations and discussions in Cape Town, the participants noted that most government members represented at one intergovernmental initiatives attending the event did not look beyond land-based mineral resource developments, and suggested the need to consider the following topics: Blue Economy, water intensity, security (piracy), impacts from moving sediment plumes, cumulative impacts, stakeholder mapping, emotional aspects (fear, out of sight), offshore mining examples from Namibia, employment, capacity building, gender, ecological impacts, and duration and record-keeping of consultation.

Prizma engaged in discussion on these topics during the seminar, and added numerous headings or topics in the TOR. Examples include Blue Economy, resource intensity, security, sediment plumes, SEP/PCDP, cumulative impacts, emotional aspects, developing additional 'comparison tables', gender, and record of engagement activities.



NAURU OCEAN RESOURCES INC.

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ANNEX 1:
TERMS OF REFERENCE FOR A SOCIAL IMPACT ASSESSMENT FOR THE NORI-D POLYMETALLIC NODULE COLLECTION PROJECT, 23 MARCH 2023

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I. Background

This Terms of Reference (TOR) was developed by Prizma LLC (Prizma), an independent advisory practice appointed by the Nauru Ocean Resources Inc (NORI), following a Prizma-led scoping exercise detailed in Prizma's report entitled Scoping Report and Engagement Record (Scoping Report[1]) for the Social Impact Assessment (SIA) of the NORI-D Polymetallic Nodule (nodules) Collection Project (the Project).

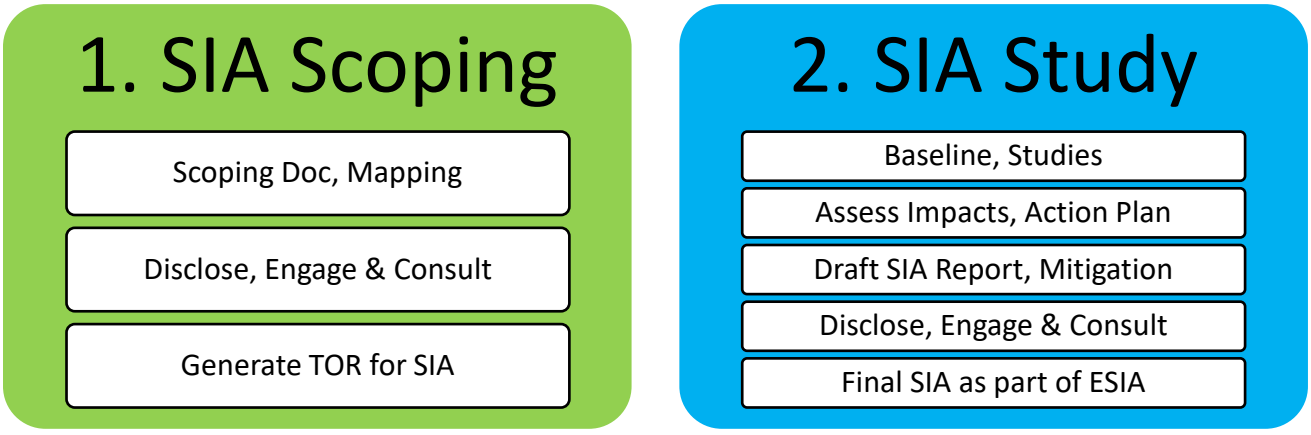
The NORI-D SIA will be the first such study for a deep-sea mining (DSM) project in international waters. The ISA's exploitation regulatory regime is not finalized. Prizma reviewed ISA's draft exploitation regulatory regime, utilized published guidance available from organizations such as the International Association for Impact Assessment (IAIA), applied the IFC Performance Standards Performance Standards on Environmental and Social Sustainability (IFC PS), and considered Good International Industry Practice (GIIP). These sources identified the need to conduct an initial screening of the Project, scope the SIA process, and enable early stakeholder engagement.

Applying these findings, Prizma segmented NORI-D's SIA process into the following two parts or phases:

1. The SIA Scoping phase, and
2. The SIA studies.

The key phases and key components of each phase are illustrated in Figure 1.

Figure 1: Prizma adopted a two-phased approach to NORI-D's SIA process



Source Prizma. Note: Doc -Document, ESIA – Environmental and Social Impact Assessment, SIA – Social Impact Assessment, TOR – Terms of Reference

[1] https://metals.co/wp-content/uploads/2023/03/NORI-D-SIA-Scoping-Report-and-Engagement-Record-Combined-20230323.pdf

Following an informal presentation entitled "What does an SIA for a Deep-Sea Mining project look like?" and discussions with interested ESIA practitioners on 5 May 2022, on the sidelines of IAIA's annual conference held in Vancouver, and consulting selected scoping studies from land-based mining, off-shore oil and gas, and offshore wind power projects, Prizma drafted the Project's SIA Scoping Document.

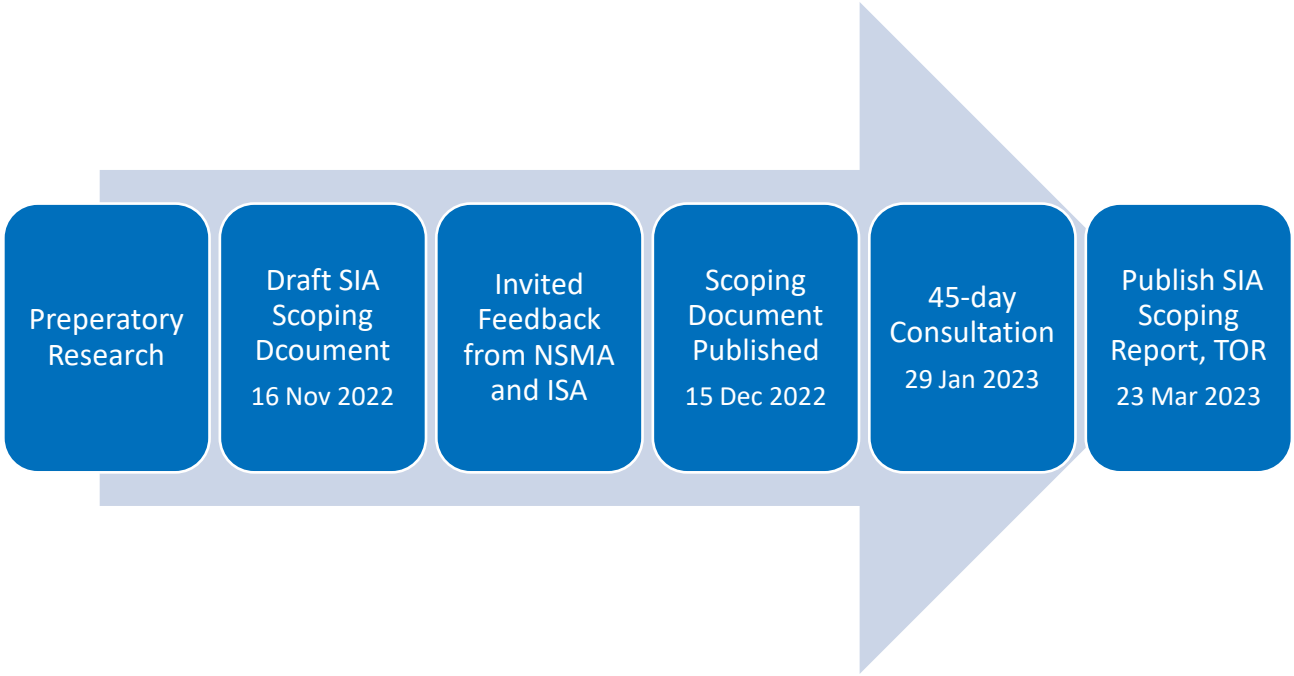
On 16 November 2022, the Nauru Ocean Resources Inc. (NORI) shared the draft SIA Scoping Document with the ISA Secretary General, requesting for the document to be further shared with ISA's Legal and Technical Commission, for feedback. The draft SIA Scoping Document was also shared with the Nauru Seabed Minerals Authority (NSMA) for information and feedback.

The SIA Scoping Document was web-published for public comments on 15 December 2022. The 45-day long consultation period following the publication of the SIA Scoping Document on 29 January 2023. NORI and Prizma also hosted two seminars to provide engagement opportunities on the sidelines of the Mining Indaba Cape Town on February 7, 2023.

No formal feedback or guidance has been provided by the ISA Secretariat or Legal and Technical Commission on NORI-D's SIA Scoping Document and/or topics or approaches to be included in the TOR.

The general timeline of NORI-D's SIA scoping process is illustrated in Figure 2

Figure 2: General timeline of NORI-D's SIA scoping process

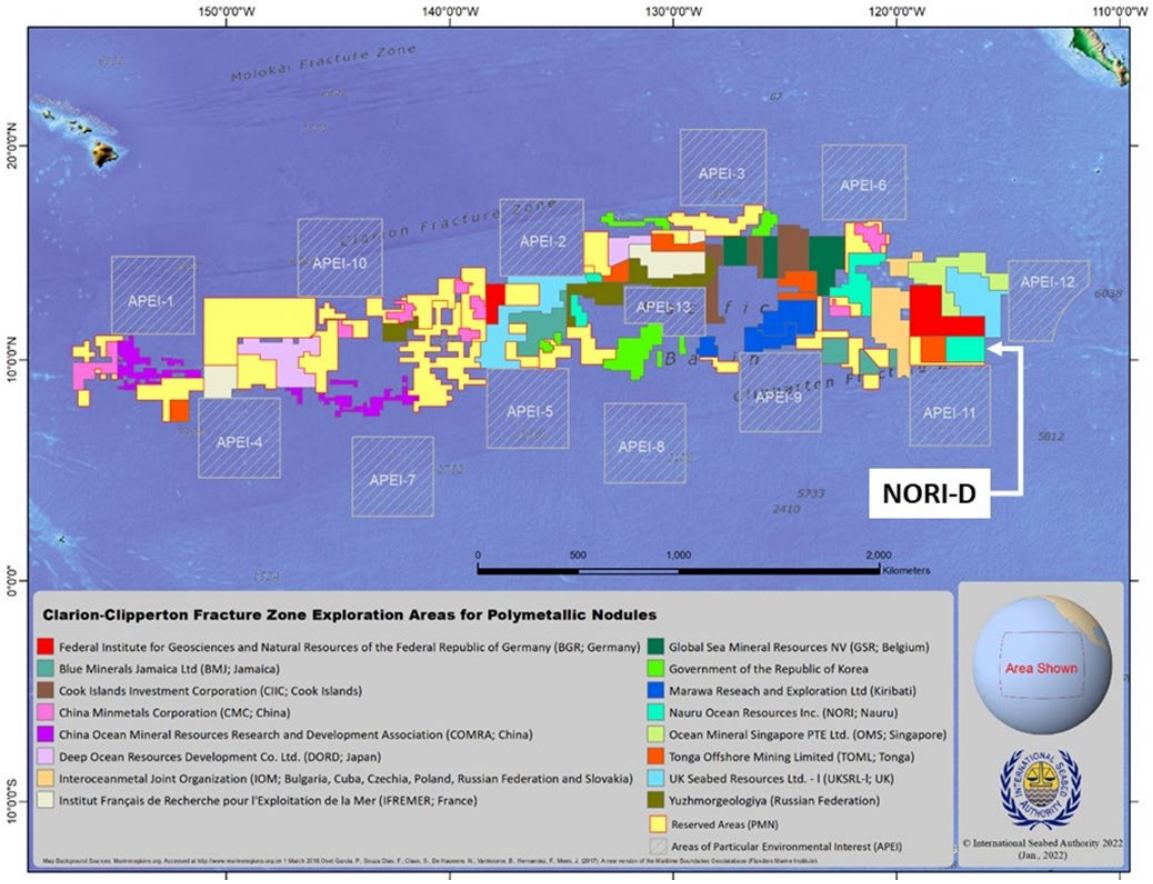


Source: Prizma. Note: SIA – Social Impact Assessment, ISA – International Seabed Authority, NSMA - Nauru Seabed Minerals Authority

II. The NORI-D Project

The Project is located within the Clarion Clipperton Zone (CCZ, see Figure 3) and would be the first deep-sea mining project in international waters in the Area Beyond National Jurisdiction. The Project involves three inter-related phases of developments designed to collect nodules containing the "battery metals" nickel, copper, cobalt, and manganese from the abyssal plains (ocean floor at over 4,000 meters depth) of the CCZ: (a) Collector Test (sea trials completed in 2022); (b) Project Zero; and (c) Project One. The nodules are expected to be toll-treated by a land-based, third-party facility[2], and/or at bespoke and newly built land-based processing facilities and are expected to be subject of future due diligence and/or assessments. The Project is described in further detail in the SIA Scoping Document, Section III, Project Description.

Figure 3: Location of NORI-D, exploration blocks, and APEI in the CCZ



Source: ISA (accessed 26/3/2022). APEI - Areas of Particular Environmental Interest represent 1.97 million km^2 of protected seafloor set aside by the ISA pursuant to regional environmental management plans.

[2] Note also TMC media release about TMC entering into MOU with nickel processor Pacific Metals Co Ltd (PAMCO) of Japan, to evaluate the processing of Polymetallic Nodules into Battery Metal Feedstocks

III. Scope of the SIA

A. Objectives

The overall objective of the SIA is to identify and analyze the potential social impacts and effects of the Project and to recommend initiatives, realize sustainable development opportunities, as well as to mitigate negative impacts. The purpose of the SIA is to:

- Engage relevant stakeholders
- Describe and analysis the social baseline
- Identify both positive and negative social impacts
- Leverage positive social impacts
- Mitigate negative social impacts
- Develop social management and monitoring plans

The SIA will further define assessment boundaries for key aspects and impacts, including spatial, temporal, technical and administrative boundaries, and include closure. This will build on the current available information from the following documents:

- NORI's Project description contained in the Scoping Document
- ISA Draft Regulations on Exploitation of Mineral Resources in the Area, March 2, 2023 and Phase I Standards and Guidelines
- IFC Performance Standards, the Equator Principles, and Good International Industry Practice
- Guidance notes from the IAIA and other relevant sources

The SIA will define the Project's social zone of influence, which will be informed by the environmental zone of influence, thresholds and uncertainties established as part of the EIA studies. The definition of the spatial scope will consider the:

- Analysis and results to be provided by the environmental studies
- Nature of the existing social baseline
- Manner in which social impacts are likely to emerge or be propagated
- Areas affected, both positively and negatively, by impacts
- Geographical and temporal boundaries
- Thresholds and uncertainties related to material social impacts
- Common Heritage of Humankind

The Project development timelines will also be incorporated into the SIA.

B. Regulatory Framework

The SIA will identify all applicable legal and regulatory standards and guidelines, and significant contextual issues, such as Blue Economy themes[3]. Prizma notes that the ISA is still developing its mining code and related regulatory regime.

The Scoping Document as well as in comments received during the Scoping Document review period, identified key elements of regulatory framework, including the following:

- United Nations Convention on the Law of the Sea on the conversation and sustainable use of marine biological diversity of areas beyond national jurisdiction
- The ISA Regulatory Regime (currently in draft form)
- Nauru International Seabed Minerals Act
- IMO, other relevant International Conventions
- IFC Performance Standards
- Proponents' Corporate Values, Policies and Standards
- Human Rights

The Project development and material permitting timelines will also be identified.

C. Project Overview

Project Proponents and Partners

- Republic of Nauru, Sponsoring State
- NORI, Contractor
- The Metals Company (TMC), NORI's parent company
- Allseas, Offshore Partner

Project Location

NORI plans to collect (also referred to as "mining", "exploitation" or "harvesting") polymetallic nodules (PMN) from the abyssal plains of the Clarion Clipperton Zone (CCZ). The CCZ is a designated area, in Areas beyond National Jurisdiction (international waters), located in the Pacific Ocean.

[3] Blue Economy: oceans as the next great economic frontier (unric.org)

Project Components and Activities

NORI proposes to implement the project in phases which allows for the ramp-up of nodule collection capacity as information is collected in the field and confidence in the technical and environmental performance of the system improves over time. A high-level schedule will also be presented.

Integrated Nodule System Collector Test

A summary of the test will be included as the data collected from this system tests informs the project design, environmental and social impact assessment, and the adaptive management system.

Project Zero

The integrated nodule system pilot collector system (as described in the NORI-D EIS (NORI, 2022)) will be upgraded into a first commercial production system and commissioned for commercial operation in the NORI-D contract area. This first phase of the NORI-D commercial development is referred to as Project Zero.

Project Zero entails:

- Refurbishment of the production vessel used in the integrated nodule collection test (the Hidden Gem)
- Nodule collection using one collector robot (1.3 million wet tonnes per year)
- Transshipment of the nodules to an existing or "brownfield" port facility (location yet to be finalized)
- Stockpiling and tolling the nodules through existing RKEF processing facilities

Project One

Subject to achieving the objectives for Project Zero, NORI will propose to ramp-up operations to Project One. Full implementation of Project One as currently planned would involve scaling up collection and processing from 1.3Mtpa to an approximate average of 12.5Mtpa of wet nodules at steady state production (expected 2030-2045).

Project One entails:

- The introduction of another refurbished vessel, with a capacity of up to 3.6 Mtpa (wet)
- A further upgrade of the Hidden Gem to up to 3.6 Mtpa (wet)
- Construction of a new purpose-built production support vessel (Collector Ship 1)

Processing Nodules

Although the on-shore processing is beyond the SIA's regulatory authority, the Project's SIA will speak to and provide context about processing, and identify corporate policies and commitments to meet applicable regulatory requirements and good international practice. Project options, alternatives and partnerships are still being developed, and Project Zero is expected to involve third-party processing (tolling) of nodules[4]. The associated social impacts are expected to be addressed in future social due diligence, studies, or assessments. Considerations will also be given to shipping related aspects, such as security.

Project Justification

The Scoping Document highlighted and described the following under Section E, Project Justification:

- Economic rationale
- Demand forecast
- Benefit sharing
- Climate change
- Diversification of resources
- Low-carbon/low resource intensity metal production
- No tailings dams
- Social impacts of alternatives
- Biodiversity opportunity costs
- Marine science knowledge and capacity building

These will be further detailed in the SIA study, highlighting also how the Project can provide an alternative source or option to obtain scarce battery metals. Other studies, including those commissioned by the ISA, which review the potential impacts from deep-sea mining on land-based producers, will also be considered.

Closure

A section describing closure planning for NORI-D Project will also be included.

D. Feasible Alternatives

When considering potential alternatives to the Project, it is important to include only those options that are technically and economically feasible, including through the use of best available technologies. Alternatives are functionally different ways to meet the need for a project.

[4] Note also TMC media release about TMC entering into MOU with nickel processor Pacific Metals Co Ltd (PAMCO) of Japan, to evaluate the processing of Polymetallic Nodules into Battery Metal Feedstocks

In Section V, Feasible Alternatives of the Scoping Document, a number of feasible alternatives were considered. Theses will be developed further within the SIA, including "no project" as an alternative. This section will also justify why, considering commonly applied E/SIA methodologies, certain alternatives proposed during the consultation phase (such as urban mining or recycling) will not be considered further in the SIA.

E. SIA Methodology

An SIA is the primary approach to a comprehensive assessment of the social effects of the Project. The SIA is a systematic process of analyzing, monitoring and proposing mitigation measures for social effects, including intended and unintended social changes. The methodology adopted includes engaging with stakeholders. The SIA will characterize both positive and negative effects.

The ISA's Draft regulations on exploitation of mineral resources in the Area identifies topics which should be covered in the EIS (see also ISBA/25/C/WP.1: Draft regulations on exploitation of mineral resources in the Area, and ISBA/27/C/5: Draft guidelines for the preparation of environmental impact statements). The Scoping Documents include these requirements in greater detail:

- A table of content for an EIS (see Table 13 in the Scoping Document)
- Key ISA terms and expectations relevant to the SIA (see Table 14 in the Scoping Document).

The draft regulatory regime referenced further above also includes references to the IFC Performance Standards and the Equator Principles.

Section X (page 70) of the Scoping Document describes key methodologies to be followed. A selection is also presented below and will be further developed in the SIA.

Identification of Valued Social Components

Environmental effects can intersect, link to and influence socio-economic and socio-cultural effects. Selecting valued components that can capture this connectivity and reflect the Project context will help in the process of predicting effects. Once valued social components (VSCs) are identified and validated, they become the focus of the social impact assessment, and an analysis of impacts to these components is carried throughout the assessment process. Engaging with a diverse group of stakeholders is important, as different stakeholders attach differing values to various VSCs which may influence their level of support for the Project.

VSC with a socio-economic and socio-cultural dimension are identified further below, along with additional topics emerging from Prizma's research and comments received during the SIA scoping stage. Additional VSCs may be identified during planned stakeholder engagement activities, and from reviewing the results of environmental studies and identification of zones of influence.

- Employment, Labour, and Gender (incl. safety, health and security)
- Economy – Impacts on Nauru and ISA (including benefit sharing and taxation)
- Workforce, Safety and Security

- Emergency Response Planning
- Fishing
- Tourism
- Scientific Research and Capacity Building
- Marine genetic resources
- Product Stewardship
- Traditional Knowledge, including emotional aspects
- Culture, including Underwater Cultural Heritage (UNESCO)
- Developing Land-based Producer States (use existing Lapteva study)
- Common Heritage of Humankind (CHH)

Uncertainty

There may be many types of uncertainties that are relevant to assessing whether an effect will occur, and the implications of the effect. Uncertainty in SIA is to be expected, particularly when predicting outcomes in complex systems. The sources of uncertainty need to be reduced where possible through additional study or mitigation measures, but when uncertainty cannot be reduced it needs to be described such that it can be considered in decision making. Throughout the SIA, effort to address uncertainties will be focused on those uncertainties that are most meaningful to the most material social risks identified during the SIA.

Impact predictions will be made using available data and information, but where significant uncertainty remains, it will be acknowledged in the SIA. A conservative approach will be used by the SIA Team and where applicable, the SIA will make recommendations concerning measures that should be in place within a Social Management Plan to further reduce or address uncertainties.

F. Baseline Studies

A desktop review of available information will be undertaken to further develop the socio-cultural and socio-economic baseline. This will include a high-level review and presentation of data and analysis from the Integrated Nodule Collector System Test, and will also take into account relevant topics related to potential social impacts related to Areas of Particular Environmental Interest (APEI), Preservation Reference Zones (PRZ) and Impact Reference Zone (IRZ).

Subject to the analysis of environmental studies and determination of zones of influence, the concept of “Affected Communities” (as defined in the IFC PS), may not be relevant given the remote and offshore location of NORI-D’s DSM activities, while land-based facilities, for which such a concept may be more relevant, have yet to be identified.

Further engagement with stakeholders and relevant organizations will be undertaken to obtain additional data. These stakeholders and organizations will be mapped, also considering emerging results from the EIA

studies, will be considered, and direct stakeholder meetings will be undertaken. Potential stakeholders called out during the scoping consultation include the following:

- Fishermen/women and fishing associations
- Women's groups and/or representatives
- Youth groups and/or representatives

A description of available traditional knowledge and cultural use will be included.

Some additional studies may be identified based on evolving Project designs and other developments related to, for example, the processing of nodules, and/or the findings of the environmental and ecological studies currently underway. At the time of drafting the TOR, no fieldwork, such as new census, household livelihood assessments, or similar other studies, are expected to be required for NORI-D's DSM activities, which are located many hundreds to thousands of kilometers away from the nearest communities. However, once future, land-based facilities have been identified, or if significant social impacts are predicted from environmental effects from NORI-D's DSM activities, social due diligence and/or a variety of assessments may be required, such as assessing economic displacement or physical resettlement. This is expected to be conducted in accordance with the relevant legislation of the host country where the processing facilities are located, as well as applying Good International Industry Practice (GIIP).

G. Potential Aspects and Impacts

The SIA will define potential aspects and impacts and identify interactions between the Project and these aspects and impacts, and outline indicators that will be used to measure them.

Based on the draft regulatory framework described further above, which are still being developed and negotiated, this section will describe the socioeconomic and sociocultural environment aspects and impacts based on the following human activities and uses:

- Fisheries
- Cultural heritage
- Marine traffic
- Submarine cables
- Tourism
- Marine scientific research
- Sociocultural uses
- GHG emissions (natural resource intensities)
- Other uses of the general NORI-D area

H. Cumulative Impacts

The assessment of cumulative impacts considers the combination of multiple impacts that may result when the Project is considered alongside other existing or proposed projects and activities in the same geographic area or affecting the same valued components. Given the Project's location and context, it is assumed that the relevant VSCs to be considered for a cumulative impact assessment are:

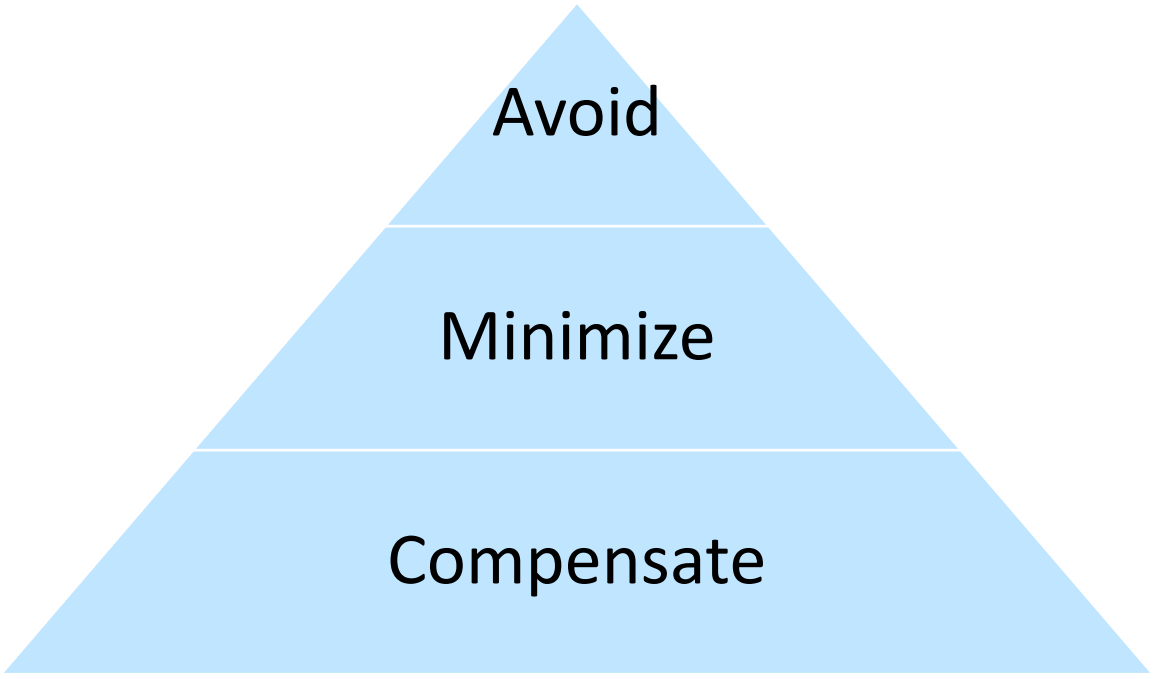
- Migratory marine species, such as whales or turtles
- Fisheries
- Climate Change (carbon sequestration, sea level rise, climatic events)
- Climate Change impact of Project (emissions, avoidance)
- Volume and price of battery metals contained in nodules
- Benefits for humankind (revenues, knowledge, education, training, pharmaceutical, biomaterials)
- Land-based facilities
- Benefit sharing
- Biodiversity and ecosystem services
- Marine genetic resources

There may be several VSCs within an effect pathway. Prioritization of VSCs that are most important to assess will be informed through stakeholder engagement and consider also traditional knowledge. The temporal boundaries, including extending it to millennia, was also proposed and will be considered during the SIA.

I. Mitigation Measures

Defining appropriate mitigation measures is a central part of the SIA process. The SIA will identify opportunities to enhance positive effects through net gain and benefits initiatives. Some examples of enhancement measures for positive effects include financial benefits, employment, skills training, investment in community projects, and scholarships. Enhancement measures should create new positive impacts or benefits. The mitigation hierarchy concept, illustrated in below, will be applied to address significant negative impacts and effects, where feasible.

Figure 4: Simplified mitigation hierarchy concept to be used in the SIA



Source: After IFC Performance Standards (PS1)

J. Residual Effects

Residual effects are those significant effects remaining after the implementation of all mitigation measures. The residual effects analysis will be clearly documented in the SIA along with supporting rationale for the evaluation. Residual impacts will be identified through a risk assessment process that will be conducted in accordance with an international standard (for example, ISO9001) to allow also a standardized risk assessment process throughout the ESIA study.

K. Consultation and Engagement

Summarize results of stakeholder mapping, engagement and outreach, and outcome of consultation activities. Records of such activities, such as minutes of meetings, will be provided in appendices. These will also identify commitments made by the Project proponents.

L. SIA Study Team

Provide a list of key contributors and authors of the SIA.

M. Conclusions and Recommendations

Provide recommendations based on the outcome of the SIA, taking also into consideration outcome of stakeholder engagement efforts.

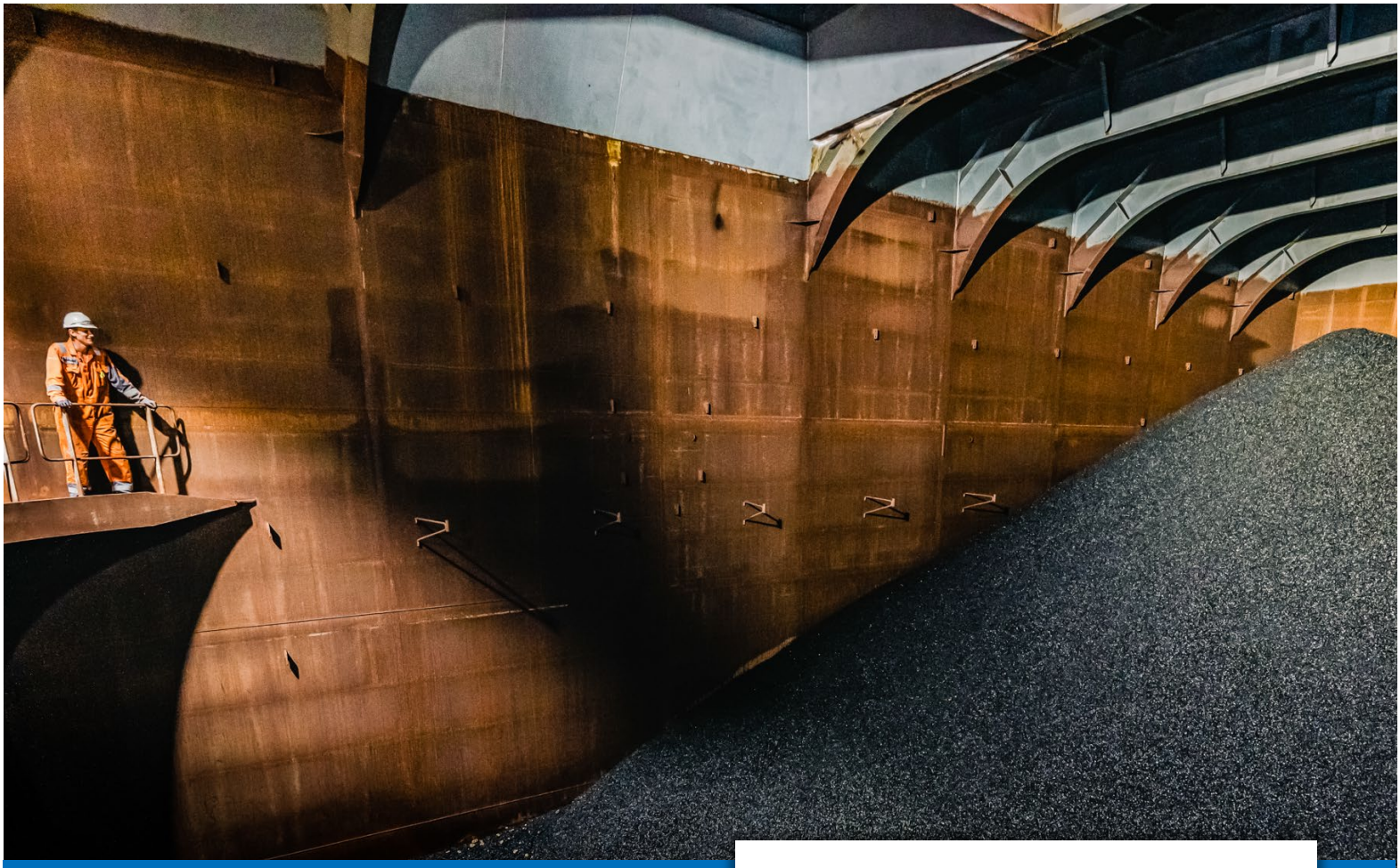
N. References

Provide a listing of key references used.

O. Annexes

The annexes that will be included in the SIA include, but are not limited to:

- Glossary
- Public Consultation and Disclosure Plan
- Social Management Plan
- Health, Safety, Emergency Response, and Security
- Consultation and Engagement Records (subject to permission)



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PRIZMA

ANNEX 2:
PRIZMA'S TEAM COMPLETING THE RECORD OF SCOPING AND TOR

Mr. Mehrdad Nazari

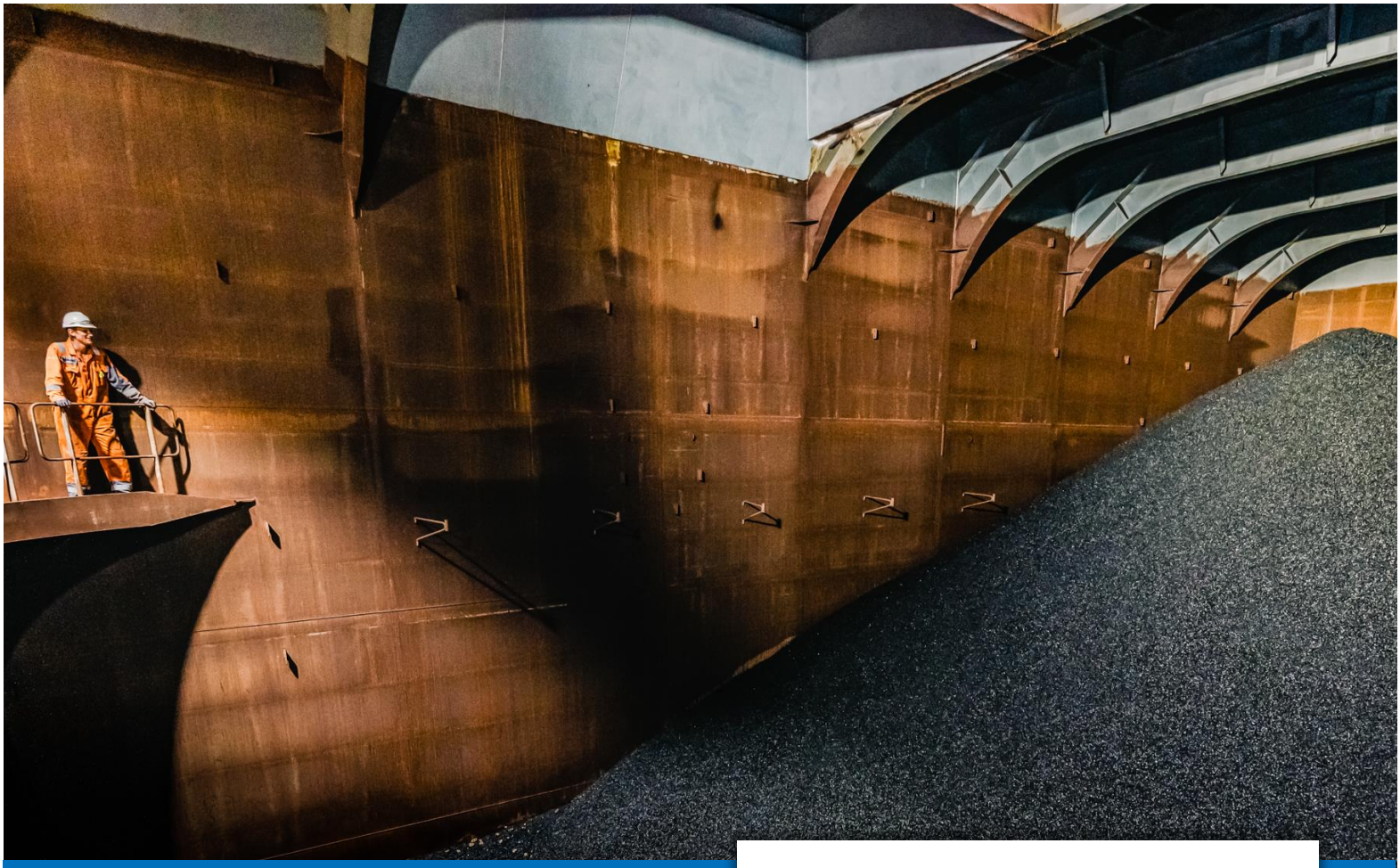
Mr. Mehrdad Nazari is Prizma's Team Leader for the NORI-D SIA assignment. He has over 25 years of international experience, including 10 years at the European Bank for Reconstruction and Development in London, where he focused on complex extractive projects. His current advisory practice focusses on mining, renewable power, and private equity. He has contributed to Independent Engineer/Monitoring Groups, and has been appointed to the E&S Expert Rosters or contributed to the grievance mechanisms of three multilateral institutions. Mehrdad studied geosciences in Germany (J.W. Goethe), USA (Fulbright grantee at UW-Milwaukee) and the UK. He holds an MSc in Hydrogeology, completed Sustainability Studies through the Rockefeller Foundation's Leadership for Environment and Development program, and obtained an MBA at Henley Business School, UK. Mehrdad's memberships include the International Association for Impacts Assessment, and the Institute of Materials, Minerals & Mining. He is a Mining Association of Canada (MAC) certified Towards Sustainable Mining (TSM) Verification Service Provider, a Copper Mark Assessor, and an AccountAbility licensed AA1000AS assurance service provider. Mehrdad resides in the USA.

Ms. Allison Rippin Armstrong

Ms. Allison Rippin Armstrong is a biologist and environmental scientist with over 25 years of experience in permitting, regulatory processes and environmental compliance, working with indigenous organizations, resource companies, regulatory agencies, indigenous, territorial and federal governments. Along the way, Allison found that her passion and calling leaned more to the areas of mentorship, advocacy, education, and training. As Compliance Specialist at the Ekati Diamond Mine, Allison was part of the team that lead the mine toward ISO 14001 certification. Allison is amazed by the incredible opportunities that she has been able to be part of and help create. Highlights include the development of environmental training modules in partnership with Yukon First Nations and Yukon University, the development of the Regional Wealth Creation Fund, as part of a negotiated Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association in Nunavut, and building a sustainability department at the Karowe Diamond Mine with Lucara Botswana. Allison has served on the board of Yukon Women in Mining for the past eight years. She is a founding member of the Yukon University Foundation Board and has served on NWT and Nunavut Chambers of Mines as well as a number of working groups for the PDAC. Allison is currently the Chair of the Board of Tectonic Metals Inc. and a Director on the Alberta Energy Regulator Board.

Dr. Don Proebstel

Dr. Don Proebstel is a conservation biologist with over 25 years of international experience, including as VP Environmental & Sustainability at Gold Reserve Inc.; Senior Environmental & Social Analyst with the US Overseas Private Investment Corporation (OPIC, now DFC); Senior Analyst Pike Research (now Navigant Research); and Senior Environmental Analyst at AATA International. Don attended the 1992 Rio Conference, Convention on Biodiversity and follow-up UNEP COP meetings, including Curitiba Brazil (COP-8, 2006) and the IUCN World Conservation Congress in Hawaii in 2016. He is also a Director at Natural Power Concepts, which is involved in the development of advanced renewable energy technology solutions. Based in Hawaii, he has worked with/developed and secured funding from the US Air Force Research Laboratory (AFRL) and also with the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii-Manoa. Early in his career, he served as the Director, World Salmonid Research Institute, and as a Senior Research Advisor, Wild Salmon Center, where he participated in ten annual river expeditions to Siberia and Kamchatka. Dr. Proebstel's academic degrees include a B.S. Fishery Biology and a PhD. In Conservation Biology, Colorado State University. He is a Mining Association Canada-certified Towards Sustainable Mining Verification Service Provider, and a member of the International Association for Impacts Assessment. Don is based in Hawaii.



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SUMMARY OF NORI-D SIA SCOPING SEMINARS HELD ON SIDELINE OF THE MINING INDABA CAPE TOWN 2023

Table of Contents

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I. Purpose

This memorandum summarizes Prizma's activities conducted during Indaba Mining 2023 in support of the Social Impact Assessment study for the NORI-D deep-sea polymetallic nodule collection project and consultation process.

II. Activities

Prizma and NORI hosted two information sessions on Tuesday, 7 February 2023, at the Southern Sun Cape Sun Hotel, Cape Town, on the sideline of the Mining Indaba 2023 which was being held in Cape Town. The objective of these sessions was to provide engagement opportunities with interested stakeholders, including social impact assessment practitioners, industry specialists, NGOs, and the general public, to learn about the planned Social Impact Assessment study for the NORI-D project, have their questions answered and provide feedback or suggestions as relevant.

The sessions were advertised though TMC and Prizma's social media, and direct outreach through emails, and during Indaba events. The format included presentations from TMC/NORI's Corey McLachlan and Prizma's Mehrdad Nazari, followed by group discussion and Q&As. TMC's board member Sheila Khama was in attendance for the first/morning sessions.

The information session format included two back-to-back opportunities to maximize participation. One session was held from 8am to 10am, and the other from 10am to 12pm. Coffee, refreshments and lunch were also provided, as well as shuttle buses to and from the Cape Town International Convention Centre, which was hosting the Mining Indaba.

A total of 31 individuals had registered online (Eventbrite). A total of 12 joined, with 6 in each of the two sessions. To respect commitments to confidentiality, attendee names and contact details have not been appended to this public record.

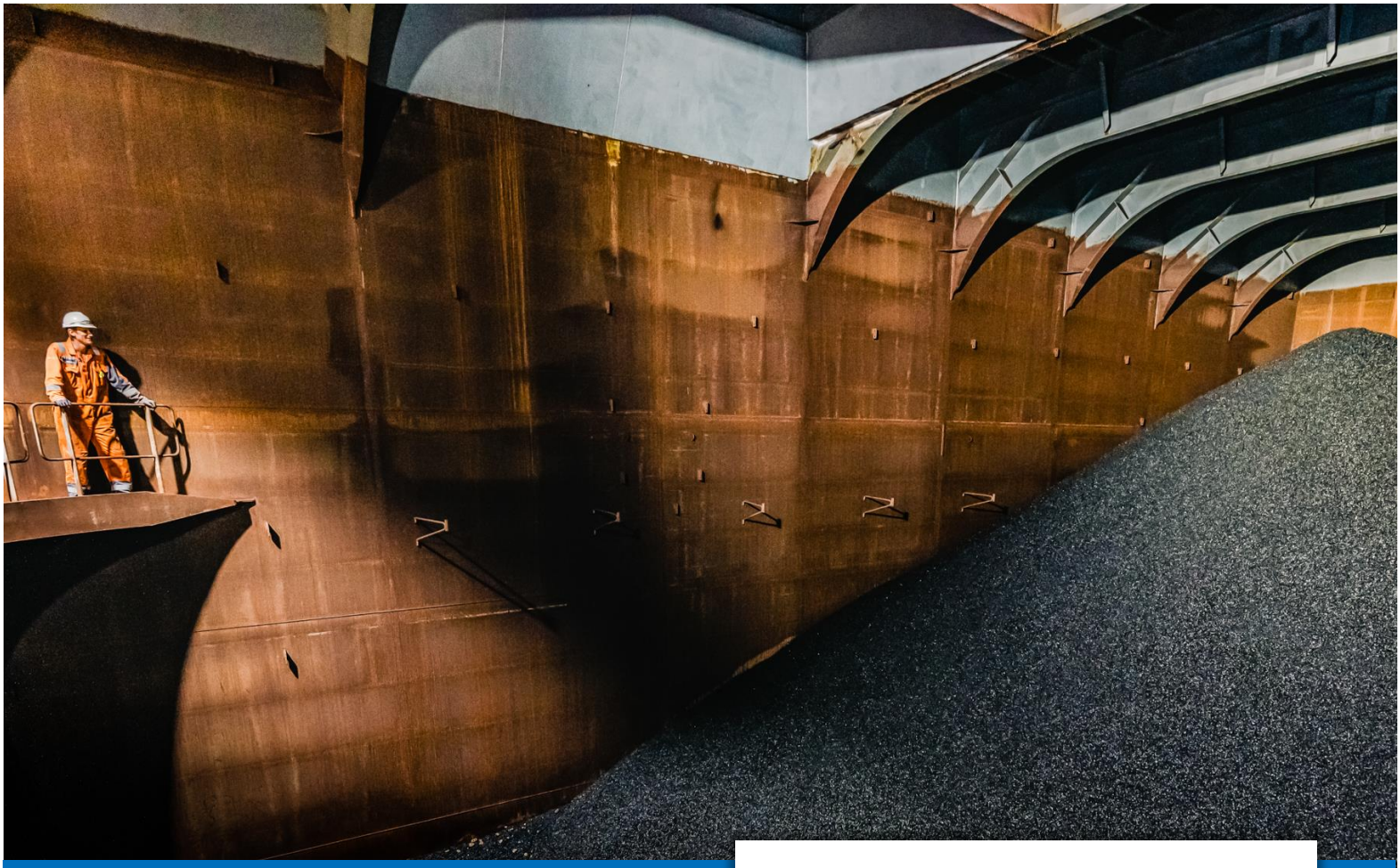
III. Summary of Discussions

The participants were invited to introduce themselves and identify how they are connected to DSM topic and/or raise topics of interest/concerns which could be discussed during the presentation. Below are the main discussions points:

- Representative of intergovernmental initiative noted the following:
    - Perspective on DSM topic was tied to being from an island nation in the Indian Ocean
    - Encouraged NORI to examine how other frameworks compare – especially both Country and International regulations over waters and water-related issues
    - Note that policies of most member countries of the intergovernmental initiative are not focused on anything beyond land-based mineral resource development

  - The intergovernmental initiative has already been working with the International Seabed Authority
  - Confirmed Peru and Eritrea are not members of the intergovernmental initiative (Developing Mining Developing Countries of interest brought up by Prizma)
  - Suggested to consider blue economy themes and referred to the Blue Economy Indian Ocean map
  - Attendee was interested to learn if process water use on ships was all seawater?
- South African industry stakeholder/community engagement and conflict resolution specialist
  - Stated general personal deep-seated concerns about 'out of sight' deep-sea mining
  - Additional concerns of future piracy risks given value of material and ongoing piracy issues in the ocean for vessels
  - Questions/interest re who are the stakeholders
  - Group considers it a unique regulatory approach
  - Comparison to Namibian coastline impact concerns (shallow dredging for diamonds or heavy mineral sands?)
  - Concerns about moving plumes in the ocean relocating and causing harm elsewhere
  - Cumulative impacts concerns
  - Noted importance of including fear, emotional elements and "beyond science" elements in NORI-D SIA process
- Other participants:
  - Employment opportunity planning: consider collaborating with countries where the field of study in the future skills needed for deep seabed mining doesn't yet exist, developing the academic/training programs there can help ensure the jobs could happen there too
  - Consideration needed re access to education to prevent or address loss/lack of access to possible future jobs in future (e.g. women or other people who don't have access to certain training for certain jobs)
    - Suggested link to Women and the Future of Mining work being done by the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF)
  - Concerns were raised about ecological impacts from DSM
- Prizma also raised questions for the experts in room:
  - How long should the consultation period be for the different outputs of SIA be?
  - The answers contributed were non quantitative but followed "it depends" on
    - Length and 'technicality' of the project
    - Inherent readability of report (requirement to foster accessibility – understandability)
    - Consider how understandable the report is?

- Need to make sure a truly thorough job is being done in the identification of stakeholders
- Concerns related to groups showing up late in the process saying they weren't aware and weren't engaged (for example, remote or Indigenous groups) – could present risk to project and/or delays
    - Document process clearly and attempts to inform and engage; paper trail will be crucial for such future events



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ANNEX 4:
RESPONSE TO STAKEHOLDER COMMENTS RECEIVED DURING NORI-D'S SIA SCOPING PHASE

Page	Section	Author	Org.	Comment	Response	Action
		Dobush, Bobbi-Jo	OF	Food security: DSM operations have the potential to negatively affect fisheries catch and yield, both on the high seas (the CCZ overlaps extensively with the remit of the InterAmerican Tropical Tuna Commission)5 and in national waters (for example in Kiribati and Hawai`i)	Noted. Impacts to Fisheries are expected to be included in the EIA. Related social aspects are relevant socio-economic impacts and will be included in the SIA. Prizma notes that it plans to conduct engagement activities in Nauru and Fiji in April and May 2023, and expect this topic to be discussed.	TOR to include heading/topic fisheries.
		van der Grient, Jesse	DOSI	Some important literature does not seem to have been consulted, and instead are supported by 'observations from NORI' which are not adequate.	The SIA scoping document includes approximately 106 citations and numerous references, including those related to ISA, IFC, EP (which also are imbedded with extensive references and literature citations). - SIA scoping section B. Fishing, Tourism & Scientific Research" (page 64) notes that NORI-D is not located within global shipping lanes. This is supported by observations which note the low frequency of seeing fishing vessels. There are also no known tourism-related activities in the Project area, and no significant tourism is expected at onshore, industrial ports or industrial manufacturing sites expected to be used by and for the Project.	TOR to include heading/topic fisheries.

Page	Section	Author	Org.	Comment	Response	Action
	General	Jackson, Julian	Pew	"Unattached nodules" is misleading The scoping document repeatedly uses the phrase "unattached nodules'', implying minimal disruption to the environment. In footnote 42, the document notes that the top five centimeters of seabed will also be collected and discharged. This process should be detailed in the main document, with reference to what is attached to the seabed and the nodules - i.e. the CCZ's rich biodiversity.	Opinion noted. SIA scoping document describes nodules as typically oblate shaped, ranging on average from 3-4 cm, which are distributed, unattached on the generally muddy seafloor of the abyssal plain at a depth of over 4,000 meters below sea level within the CCZ in the Pacific Ocean. This characterization still seems correct. The comment is also correct in pointing out that the collection of nodules will be accompanies by collection of sediments. The closure section of the SIA document notes that nodules provide a hard substrate for critical life functions for certain fauna, and that high level of uncertainty exists around recovery of such fauna. The EIA studies are expected to cover this topic. The SIA will also include this information.	TOR to include heading/topics project description, also noting the removal of approx. 5cm of sediments with nodules.
7	III.B	van der Grient, Jesse	DOSI	For a better overview it would be useful to include how nodules are created (precipitation of metals from out of the water around an organic nucleus) and that the process takes millions of years to grow a nodule. Please include.	Noted. Similar to many other mineral deposits, the development of nodules can be measured in 'geological time-scales'	TOR to include heading project description and describe nodules and their genesis in greater detail.

Page	Section	Author	Org.	Comment	Response	Action
7	III B	van der Grient Jesse	DOSI	The statement about CCZ containing some of the lowest biomass on Earth can easily be misinterpreted here. First and foremost: the CCZ is understudied. NORI-D has released some high-level data during their final submitted EIS to the ISA (note that the approved EIS is not publicly available), but that is not detailed enough to determine whether biomass for all faunal groups follow this pattern. That is, most benthic and pelagic faunal groups were not analyzed sufficiently to determine this. Second, Paulikas et al. (2020) do not describe or estimate biomass. Using search terms like 'biomass', 'weight', 'fauna' or 'CCZ' does not provide an indication to what biomass estimate reference 9 refers to here in Paulikas et al. Neither does Paulikas et al. (2020) estimate or determine that abyssal plains are common habitats. This use of reference is incorrect and should be replaced with something that supports the claims, and ideally the biomass claim. Further, one other issue with using Paulikas et al. (2020) is that it is funded by TMC, and thus would need support in any case from another reference that is not funded by proponents of deep-sea mining.	Comments and opinions noted. Biomass highlight in the project description and location in the SIA scoping document (pages 6-7) to be revisited and/or replaced, and expected to be described in the EIA. The Collector Test EIA can be accessed on TMC's website (https://metals.co/nori/). The Collector Test EIS – Revised Final Submission can be accessed here: https://metals.co/download/238867/?tmstv=1670304224 (and other section are also web posted).	TOR to include heading/topic project description (and ensure description and reference to be obtained from EIA study used correctly).

Page	Section	Author	Org.	Comment	Response	Action
7	III B	Jackson, Julian	Pew	The Scoping Document characterizes the CCZ abyssal plains as "*common habitats, which feature some of the lowest biomass on earth*". The CCZ is home to relatively low abundances, yet highly diverse communities. As Uhlenkott et al (2022) describe it, the CCZ is "a heterogeneous abyssal plain area....The relatively high heterogeneity of the CCZ seabed is thought to promote the development of highly diverse benthic communities" (see: https://www.nature.com/articles/s41598-022-12323-0; for more on CCZ biodiversity also see: https://www.frontiersin.org/articles/10.3389/fmars.2021.671062/full; https://www.frontiersin.org/articles/10.3389/fmars.2021.661685/full) See also the report of the workshop on deep CCZ biodiversity synthesis (https://isa.org.jm/ files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_ -_final.pdf) which notes that "as for many abyssal regions, rare species dominate the diversity for nearly all faunal size classes/groups for all sites, substrates, and habitats thus far sampled" and estimates that 25 to 75% of species have yet to be discovered in areas that have been sampled. In fact, a pending publication suggests that 82 to 92% of benthic metazoan (animal) species in the CCZ remain undescribed and ~60% of described species have only been sampled once. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4276976). The Scoping Document should take into account the high biodiversity of the CCZ and the need to protect rare species (many of which have yet to be discovered/characterized).	Comment on biodiversity of the CCZ is noted. Biodiversity issues are expected to be covered in the EIA, and will be reviewed in terms of social impacts (ecosystem services) for the SIA.	TOR to include heading/topic project description (and ensure description and references to be obtained from EIA study used correctly).

Page	Section	Author	Org.	Comment	Response	Action
9	III - C: The Collector Test	Jackson, Julian	Pew	This section describes that "'Adaptive Management approach to the implementation of the commercial phase of nodule collections is considered best practice for a nascent industry with a relatively short history". The article cited notes that adaptive management is interdependent with the precautionary approach and ecosystem approach, yet both of those approaches are not mentioned in the document. If this adaptive management approach is retained we recommend that the report relates how this approach is compatible with the precautionary approach and ecosystem approach (which are obligations as the draft exploitation regulations currently stand). International practice suggests that adaptive management is only compatible with precaution when there is sufficient baseline knowledge, clear and enforceable environmental objectives, processes for evaluating monitoring results to review and refine the hypotheses and the potential harm is reversible, and as such appears not to be appropriate at this time for deep-seabed mining.	Noted. The EIA is expected to provide more detailed information on this topic.	TOR of SIA to include topic/heading mitigation measures and provide high-level description on adaptive management (EIA expected to cover this is greater detail), particularly as relevant to social risks.
9	III - C: The Collector Test	Jackson, Julian	Pew	This section describes monitoring of plumes and noise, and the continuation of monitoring after the collector system test. The section should note whether the data will be made publicly available and how it will be submitted to the ISA for review.	Noted. These comments appear to be most relevant to the EIA and are expected to be covered there, and related social risks will be picked up in the SIA. The EIS (ESIA) is expected to be published by NORI and subject to public consultation.	The TOR for the SIA to include heading/topic engagement and consultation.

Page	Section	Author	Org.	Comment	Response	Action
16	III D	Jackson, Julian	Pew	Table 2 is organized such that it seems as though NORI-D will have *no* impacts, with the caveat that "it is not implied that there may not be other types of impacts". This table would be more useful for the purposes of assessing impacts if it compared a comprehensive list of impacts for both generic land-based mines and NORI. Footnote 15 concedes that while there are no plants in the deep sea, there are other biodiversity and ecosystem service concerns (including marine genetic resources). These concerns should be brought up to the main text. There will be biodiversity impacts and there is a high diversity of life in the CCZ, even if they are not plants.	Comment on Table 2 is noted. - The SIA scoping document is focused on social issues and shows that common drivers of social risks in mining are largely absent for NORI-D (no local communities, no major infrastructure requirements, no resettlements required, no large scale workforce or influx, no child labor, etc.). This analysis remains correct and differentiates NORI-D's DSM from land-based mining activities. The document highlights - in other places, such as page 31 - that biodiversity issues – as well as other environmental topics – will be included in the environmental impact assessments process, and that linkages which may lead to significant social impacts will also be assessed in the SIA. The SIA scoping document also refers to call for moratorium on DSM and provides, as one example, a link to WWF's web-posted policy position.	TOR to include heading project description or mining process, and SIA to elaborate on biodiversity aspects expected to be described more fully in the EIA).
17	III B	Jackson, Julian	Pew	Further, discharging sediment back into the water column could have environmental impacts which should be more clearly noted. ((see Drazen et al 2020: https://www.pnas.org/doi/10.1073/pnas.2011914117)	Noted. Impacts from sediment discharges back into the water column are expected to be included in the EIA.	TOR to include heading project description or mining process, and SIA to summarize associated environmental impacts expected to be described in the EIA).

Page	Section	Author	Org.	Comment	Response	Action
17	III B	Jackson, Julian	Pew	This section says the nodules "sit unattached on the seafloor" and do not require "removal of overburden". However, footnote 42 (p26) notes that "5cm of seabed sediments are expected to be entrained and collected" and that some portion of this will be discharged back to the ocean "*at a depth to be determined"*. The description of "unattached" nodules is misleading as the seafloor itself will be entirely removed down to 5cm, including any wildlife attached to the nodules or seafloor. Also, the NORI EIS for the collector test said the top 10-15cm of sediment would be disturbed. Is this no longer the case? It is worth noting that 90% of the sediment microbial community live in the top 10cm, and it could take decades before the microbial community recovers (https://www.science.org/doi/10.1126/sciadv.aaz5922).	The term "unattached" is used to indicate that there is no need for activities such as blasting with explosives and/or use of mechanical equipment to collect (mine) nodule. On land, to gain access to one unit of ore (which still requires more processing to separate the small fraction of concentrates containing economic minerals from tailings) often requires the removal of one or many more units of overburden or waste rock (a process also known as stripping). In Prizma's experience, this involves stripping ratios in other order of 1:1 (underground mining) to 1:10+ (open pit mining). This type of stripping process is absent for NORI-D due to unique characteristics of nodules and their general distribution on the abyssal planes/ocean floor. As noted in the comments, approx. 90% of sediments collected along with the nodules are discharged at/near the ocean floor (no chemical additives or disinfection involved), and the balance of sediments is separated and returned at an estimated 1,200 meters below water surface (final depths still under investigation).	TOR to include heading project description or mining process, and SIA to summarize the aspects related to sediment removal and disturbance.
18		Sharma	Independent	Monitoring: Were any sediment and fauna samples collected for impact assessment or only plume studies with sensors were conducted?	The Collector Test EIS contains description of past and planned baseline studies, plume studies, and monitoring programs (see also Chapter 6 of the Collector Test EIS: https://metals.co/wp-content/uploads/dlm_uploads/2022/12/NORI-D-Collector-Test-EIS-Final-Chapter-6.pdf). These topics are expected to be covered in the EIA and related studies.	TOR to include topic collector test and baseline data (note if queried or other relevant data was collected)

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18	III E	Jackson, Julian	Pew	Under "*Biodiversity"* , NORI-D is described as "*located in generally common habitat"* as noted in our line for page 7 - the CCZ is highly heterogenous with high biodiversity.	Comment on biodiversity of the CCZ is noted. Characterization of habitats and biodiversity issues are expected to be provided in the EIA and will be adopted in the SIA.	TOR to include heading project description or mining process, and SIA to include from EIA the characterization of the habitat and its regional context).
18	III E	Jackson, Julian	Pew	NORI should define "tailings" and how they are different from the sediment that will be discharged in the planned project. As outlined in footnote 42, the seafloor will be dug up to a depth of 5cm. Most of the sediment will be left on the seafloor - however the sediment will no longer be in its original state. Any wildlife attached to the nodules or the seafloor will be killed. As the deep sea has slow growth and long life cycles, it is unlikely that the area will rebound back to its original state quickly. This is an environmental impact with social and cultural implications that should be noted.	Given the characteristics of nodules, the ISA does not refer to "tailings" in the context of DSM. Instead, the ISA's terminology refers to "sediment", "discharge", or "sediment plumes". The SIA will also adopt these terms. The SIA or EIA will quantify waste products and their destination. TMC's 2021 Impact Report summarizes the near-zero solid waste processing flow sheet for collected nodules on page 87 and can be accessed here: https://metals.co/tmcs-inaugural-impact-report/	Although the topic of waste is expected to be covered in the EIA studies, the TOR for the SIA will contain heading/topic of waste.

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18	III D	Jackson, Julian	Pew	Under "*Description*" the land option is described as an open-pit with a slurry pipeline whereas NORI-D only involves "*deep sea collection of PMN*". There should be a more even description of the two options - the NORI-D project will remove the top 5-15cm of ocean floor and involve returning a slurry of sediment to the seafloor or water column (TBD). Under "Tailing Management Facility" it would be helpful in the SIA to include information to verify the claims made in this section. Our understanding is that the minerals of interest make up roughly 33% of the nodule. So, assuming 100% efficiency and sufficient demand for those minerals of interest (which seems to be questionable at the very least for manganese) there will be 67% of the nodule left over in the form of iron, magnesium, sodium, aluminum, silicon oxides and hydroxides. It is not clear to us from publicly available resources what will happen to these materials. If they are not sold then they would need to be stored in some sort of tailings facility. More information on this would be very much appreciated.	Relevant ISA documents reviewed do not contain the term "Tailings", which seems relevant to land-based mining operations and typically refers to crushed, pulverized, treated, processed, and rejected mine waste materials. Instead, the terms ISA uses include "sediment", "discharge", or "sediment plumes". The SIA will also adopt these terms. On land, to gain access to one unit of ore (which still requires more processing to separate the small fraction of concentrates containing economic minerals from tailings) often requires the removal of one or many more units of overburden or waste rock (a process also known as stripping). In Prizma's experience, this involves stripping ratios in other order of 1:1 (underground mining) to 1:10+ (open pit mining). This type of stripping process is absent for NORI-D due to unique characteristics of nodules and their general distribution on the abyssal planes/ocean floor. As noted in the comments, approx. 90% of sediments collected along with the nodules are expected to be discharged at/near the ocean floor, and the balance of sediments is separated and returned at an estimated 1,200 meters below water surface (final depths still under investigation). - The EIA/SIA are expected to include process flow sheet, identify marketable products, and list estimated waste streams.	Although the topic of waste is expected to be covered in the EIA studies, the TOR for the SIA will contain heading/topic of waste.

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18	III D	Jackson, Julian	Pew	Additional sediment will be "*transported to the surface vessel to be separated and discharged back to the ocean at a depth to be determined"* . It is unclear whether any chemicals or additives (flocculants etc.) will be used on or discharged with the sediment. Regardless, sediment discharged into the water column would have environmental impacts, it is important to consider these mid-water impacts to the wildlife living in the water column (see Drazen et al 2020: https://www.pnas.org/doi/10.1073/pnas.2011914117). Affecting mesopelagic food-webs could potentially have social implications if fisheries are affected. Although there will be no traditional tailings dam, there will certainly be leftover sediment to be disposed of with its attendant impacts. Also note our questions about tailings under our General Comments.	Noted. The SIA scoping document notes that, at the surface production support vessel, the collected nodules will be separated from the sea water – containing any residual sediments, nodule debris, and exhibiting elevated oxygen and temperature – is discharged at a depth of approximately 1,200 meters below sea level during the collector test. Models show that this discharge is expected to mix with 500 – 1,000 times the volume of surrounding seawater within 500 m of the discharge pipe, returning the water characteristics close to background levels. - The monitoring results from the recent collector test are expected to provide valuable data. Impacts related to sediment discharges back into the water column are expected to be included in the EIA, including use of additives and impacts to mid-water wildlife or organisms that may in turn impact fisheries. Related ecological and/or fishery impact issues that are relevant to socioeconomic impacts which will be addressed in the SIA.	EIA expected to address issues identified in comments. TOR of SIA to include headings/topic project description and fisheries.

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18	III D	Jackson, Julian	Pew	Again, it is misleading to describe the nodules as "*unattached on the seafloor"* as the seafloor itself will be dug up along with any wildlife attached to it. Deep sea mining will also create a sediment plume that could affect an area much larger than the direct mining footprint. The sediment plume will also have environmental effects.	The term "unattached" is used to indicate that there is no need for activities such as blasting with explosives and/or use of mechanical equipment to collect (mine) nodule. On land, to gain access to one unit of ore (which still requires more processing to separate the small fraction of concentrates containing economic minerals from tailings) often requires the removal of one or many more units of overburden or waste rock (a process also known as stripping). In Prizma's experience, this involves stripping ratios in other order of 1:1 (underground mining) to 1:10+ (open pit mining). This type of stripping process is absent for NORI-D due to unique characteristics of nodules and their general distribution on the abyssal planes/ocean floor. As noted in the comments, approx. 90% of sediments collected along with the nodules are discharged at/near the ocean floor (no chemical additives or disinfection involved), and the balance of sediments is separated and returned at an estimated 1,200 meters below water surface (final depths still under investigation).	TOR to include heading project description or mining process, and SIA to summarize the aspects related to sediment update.

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20	III D	van der Grient, Jesse	DOSI	Based on the few datasets that are available from the CCZ, it indicates that there is a lot of heterogeneity in seafloor communities, so a statement like 'general common habitat' is not correct. There are lots of new species discovered, numbering in the 1000s at the moment (why are these not listed like for the Malagasy mine?). Based on the expeditions NORI-D has conducted, it is difficult to understand how NORI will 'identify and select' PRZs, at least, not based on informed decisions supported by data. The limited data that NORI provided for their final EIS submission to the ISA showed that even at low taxonomic resolution there are clear differences between the biological communities of the PRZ and IRZ, so that would suggest the preservation function of the PRZ is limited and may not include communities found in wider areas. Further, limited work has been done on connectivity, thus suggesting that the undisturbed nodules can function as stepping stones is not informed by data, and thus perhaps should not be listed here as it can hint at false promises. Last, it is pretty well established that the risk to biodiversity cannot be mitigated as it includes habitat removal. In that same line of thought, reducing the impacts also seems unlikely. This is further supported by the unique traits of deep-sea organisms (slow pace of life, low reproductive production) which means recovery will be slow, if at all possible. These results we have seen from small-scale disturbance experiments and impacts of deep-sea trawling.	These comments and opinions are noted, and appear to be more relevant to the EIA, and will be passed on to the EIA team for further consideration.	EIA expected to cover these topics. TOR for SIA to include topics APEI, PRZ and IRZ and provide high-level summary.

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20	III D	van der Grient, Jesse	DOSI	The APEI are not necessarily similar to NORI-D. It is up to NORI-D to show data to support that they are. Further, a statement like this requires an equivalent for the Malagasy mine. There are protected areas in Madagascar as well which may be more likely to be similar to the flora and fauna found at Ambatovy.	As noted in the SIA scoping document, the ISA-designated APEI (approximately 43% of the CCZ) are intended to protect representative seafloor areas, are closed to mining, and intended to safeguard seafloor biodiversity and ecosystem functions across the region. Additional details, such as expert workshops convened by the ISA to identify APEI, can be accessed here: https://www.isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone	EIA expected to cover these topics. TOR for SIA to include topics APEI, PRZ and IRZ and provide high-level summary.
20	III D	van der Grient, Jesse	DOSI	This does lead me to state: more care ought to be taken to ensure that similar things are considered here. Equivalent factors are not included in the two comparisons, which can give the interpretation of cherry picking facts. This needs to be avoided, and thus I encourage you to take greater care in what is compared.	Opinion noted. Section II.D (Unique Attributes, see page 15-16) compares NORI-D to a generic (hypothetical) land-based mine and a specific example, a nickel and cobalt producing operating mine in Madagascar, which also applies the IFC Performance Standards. The key differences, such as those related to lack of tailings management facilities or other major infrastructure, no resettlement impacts, are publicly disclosed facts for the Malagasy mine. The SIA is "cherry picking" in a sense of focusing on social issues (as would be expected for a social impact assessment). However, in line with other request, alternative comparison tables using offshore developments, such as oil & gas, will be provided in the SIA study.	TOR to include heading unique attributes, and SIA to add 1-2 other comparison tables, using other types of off-shore developments.

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26	III E	Jackson, Julian	Pew	NORI should define “tailings” and how they are different from the sediment that will be discharged in the planned project. As outlined in footnote 42, the seafloor will be dug up to a depth of 5cm. Most of the sediment will be left on the seafloor - however the sediment will no longer be in its original state. Any wildlife attached to the nodules or the seafloor will be killed. As the deep sea has slow growth and long life cycles, it is unlikely that the area will rebound back to its original state quickly. This is an environmental impact with social and cultural implications that should be noted.	ISA documents reviewed do not contain the term “Tailings” as is more relevant to land-based mining operations, were it typically refers to crushed, pulverized, treated, processed, and rejected mine waste materials. Instead, the terms ISA uses included “sediment”, “discharge”, or “sediment plumes”. The SIA will also adopt these terms. Impacts on wildlife and other organisms associated with the nodules are also expected to be evaluated in the EIA. Relevant social and cultural implications will be covered in the SIA.	EIA to cover impacts from sediment discharge. - Add term glossary to the SIA and define the term "tailings" and why it does not apply to NORI-D's DSM activities.
26	III E	Jackson, Julian	Pew	Also, as noted in our comments on table 3, we are not convinced based on resources publicly available that there will be near zero tailings and therefore no need to store them. Over two-thirds of the nodules consist of non-target components, which will have to go somewhere. We recommend in the SIA report that more information is provided to verify this claim.	Noted. The EIA/SIA studies are expected to include processing flow sheet, identify marketable products, and estimated waste streams.	EIA to cover impacts from sediment discharge. - Add term glossary to the SIA and define the term "tailings" and why it does not apply to NORI-D's DSM activities.

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27	III E	van der Grient Jesse	DOSI	Unique biodiversity from the deep sea is preserved by not mining. There is no possibility of avoiding biodiversity loss should mining commence. There is likely little opportunity for mitigation as habitat is removed as sediment plumes are generated. Reducing the risk of biodiversity loss is again unlikely. Natural recovery rates are not known, but there are some estimates: 10s to 100s of years, which ought to be included here (e.g., Jones et al. 2017). The operational EIS is unlikely to estimate this risk because the results will not be available before TMC/NORI intends to apply for a commercial license.	Biodiversity issues are contained in the EIA and will be reviewed in terms of ecosystem services for the SIA. Prizma would also refer the commentator to the counterfactual case. The Intergovernmental Panel and Climate Change's (IPCC) "business as usual" predictions about oceans (https://www.ipcc.ch/srocc/), notes that GHG emissions from human activities have already and are expected to continue to cause ocean warming, acidification, and oxygen loss. These contribute to systematic threats to biodiversity in the oceans even with no NORI-D project. A report by the IPPC finds that 99% of the world's warm-water coral reefs could disappear if global average temperatures rise by 2°C or more above pre-industrial levels.	Ecosystem impacts are expected to be reviewed as part of the EIA. The TOR for the SIA to include headings/topics of climate change and biodiversity.
27	III E	van der Grient, Jesse	DOSI	Starting deep-sea mining will also result in biodiversity risk and biodiversity decline. The point of this statement is not clear – are you suggesting that the loss in biodiversity would be acceptable when it would result in the rapid delivery of battery metal supply?	The SIA scoping document notes that, when considering the sustainability assessment of nickel mining, the 2022 KU Leuven study highlights that 54 percent of global nickel production happens in areas with a high biodiversity risk, notably Indonesia, Philippines, and New Caledonia. According to a recent article in Science, under business-as-usual global temperature increases, the marine systems are likely to experience mass extinctions on par with past great extinctions. IPCC's "business as usual" predictions about oceans notes that GHG emissions are expected to continue to cause ocean warming, acidification, etc., in turn, contributing to systematic threats to biodiversity in the oceans even with no NORI-D project.	Ecosystem impacts are expected to be reviewed as part of the EIA. The TOR for the SIA to include headings/topics climate change and biodiversity.

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27	III E	van der Grient, Jesse	DOSI	Stop giving percentage areas of the CCZ, this is disingenuous as NORI-D is not shown to be homogeneous, let alone the CCZ. This argument would not fly for suggesting that deforestation in some areas is ok. Everyone realizes that there are many different forest types; you would not consider cutting down part of the Amazonian rain forest because it represents a small percentage of the whole of the Amazonian rainforest or it represents a small percentage of all forest in the world. These comparisons represent a false narrative.	Opinion noted. The paragraph commented on (paragraph 4 p 27) presents a summary description of the CCZ, and allocation of 43% as 'no mining/protection' areas (APEI) based on workshops involving numerous experts convened by the ISA from time to time. Further background about the APEIs, their characteristics, etc. can be accessed here: https://www.isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone. The EIA is expected to characterize the topic of biodiversity impacts.	Ecosystem impacts are expected to be reviewed as part of the EIA. The TOR for the SIA to include headings/topics biodiversity.
27	III E	van der Grient, Jesse	DOSI	The results of the effects of partial nodule cover and no-take areas will not be available for several years. To include that analysis in an assessment as this would mean waiting for the results to be available. What does recovery mean here? Nodule-dependent species will reduce in abundance with the risk that small populations face, as the nodules will be removed and these will not come back for millions of years.	Opinion about need to collect data for many years is noted. The EIA to cover related topics, including when discussion closure planning for NORI-D. The SIA scoping document notes that the "extent to which planned measures, such as leaving behind partial nodule cover and setting aside no-take zones inside contract areas would aid recruitment and recovery of nodule-dependent species in impacted areas and/or the CCZ more broadly are being studied. Such aspects have also been considered when ISA designated four additional Areas of Particular Environmental Interest (APEIs 10 - 13) in 2021." Further background about the APEIs, their characteristics, etc. can be accessed here: https://www.isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone.	Ecosystem impacts (including partial nodule cover) are expected to be reviewed as part of the EIA. The TOR for the SIA to include headings/topics biodiversity.

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29	IV A	Jackson, Julian	Pew	Removal of forests and topsoil: It should be more clearly stated, in the main text and not a footnote, that in seabed mining at least the top 5 cm of the seabed is removed along with any attached wildlife;	Noted. As already included in the SIA scoping document, the SIA to continue to describe the removal of top layer of sediments during removal of nodules in the main text (not a footnote), and note also in the impact section that that this entails removal of attached wildlife.	TOR to include project description, mining process, and impacts, and SIA to note in main text the removal of some sediments, and removal will affected attached wildlife.

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29	IV A	Jackson, Julian	Pew	Long term effects after closure: Long term effects will also exist for seabed mining - as noted by Simon-Lledo et al (2019, https://www.nature.com/articles/s41598-019-44492-w) effects from a simulated deep-sea mining experiment were noted 26 years later. Further, "*nodule removal will also alter the character of the seafloor habitat for the very long-term (i.e. thousands of years)". (emphasis adds)*	The SIA scoping document contains a section on Closure which reads: Prior research indicates that the density, diversity, and function of fauna representing most of the resident biomass (including mobile, pelagic, and microbial life) are expected to recover naturally over years to decades. However, a high level of uncertainty exists around recovery of fauna that requires the hard substrate of nodules for critical life function. The extent to which planned measures such as leaving behind partial nodule cover and setting aside no-take zones would aid recruitment and recovery of nodule-dependent species in impacted areas will depend on factors like habitat connectivity, which is an area that is still under study. The Collector Test (expected completion Q4/2022) will represent the first temporal data point in the long-term monitoring program for the Impact Reference Zone (IRZ) and Preservation Reference Zone (PRZ). IRZs and PRZs are important in identifying natural variations in environmental conditions against which the impacts of mining can be assessed. A post-test long term monitoring program for the IRZ will be included in the [EMMP] to be developed for submission with the application for the exploitation contract.	The EIA expected to cover closure-related topics. TOR of SIA to include short summary of the closure section.

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29	IV B	van der Grient, Jesse	DOSI	The impacts of deep-sea mining, should be listed and are: habitat removal of which restoration is unlikely, sediment removal, sediment compaction, sediment redistribution, increased sediment deposition, sediment plumes, metal-laden sediments in the environment, biomass removal, smothering of animals, clogging of filtering apparatuses and gills, decreased quality of visual environment, light pollution, noise pollution, and that is for the seafloor. The release of the discharge plume also includes the sediment, light and noise pollution. It is also worth to state that these impacts are not limited to the area that is directly mined. Thus, the footprint of mining is significantly larger.	Noted. Comments primarily relate to environmental impacts, which are expected to be assessed and listed in the EIA	Topics expected to be covered in the EIA. The TOR to include headings/topic on biodiversity, and provide high-level listing/summary.
29-30		Jackson, Julian	Pew	In comparison to its description on conventional mining, this section vastly underplays the effects of PMN mining. Again, it is misleading to describe the nodules as "*unattached*" when the seabed itself is collected. The section says there will be "*No rock cutting, digging...*" this is particularly confusing when the top five centimeters of the seabed are expected to be collected. This section notes that there will be "no removal of plants" - however fails to mention the immense biodiversity in the CCZ that will be impacted by deep sea mining. See earlier reference to potential impacts in upper water column (photic zones) to phytoplankton - which may in turn impact the ability to absorb CO2	The term "unattached" is used to indicate (differentiate) that there is no need for activities such as blasting using explosives or use of shovels (commonly used in mining) to collect (mine) the nodule. The recent collector test is expected to provide valuable information as to the removal and entrainment of sediments during collection (mining) of nodules. These topics are expected to be covered in the EIA. Impacts of sediment plumes in the upper water column is also expected to be addressed in the EIA.	TOR to include heading project description, mining process, and biodiversity (and impacts), and SIA to provide/clarify relevant details.

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30	IV B	van der Grient, Jesse	DOSI	Note that the pilot trial will provide limited information, and especially for the pelagic impacts as the discharge plume generation was not as successful and impacts on metazoans were not investigated. What is the 90% estimate based on? How is this estimated? I assume this occurs in the collector vehicle, but again, how? Note that there is a decrease in pH measured in the discharge plume – thus increased acidification. What models show this? And is this based on data collected from the collector test? As that does not represent a commercial discharge plume. That seems to underrepresented the spatial scale. This focus on the removal of plants is not a fair comparison. Focus on the removal of animals instead.	Noted. Comments primarily relate to environmental impacts, which are expected to be assessed in the EIA. - For land-based mining, to gain access to one unit of ore (which still requires more processing to separate the small fraction of concentrates containing economic minerals from tailings) often requires the removal of one or many more units of overburden or waste rock (a process also known as stripping). In Prizma's experience, this involves stripping ratios in other order of 1:1 (underground mining) to up to 1:10+ (open pit mining). This type of stripping process is absent for NORI-D due to unique characteristics of nodules and their general distribution on the abyssal planes/ocean floor. As noted in the comments, approx. 90% of sediments collected along with the nodules are expected to be discharged at/near the ocean floor, and the balance of sediments is separated and returned at an estimated 1,200 meters below water surface (final depths still under investigation).	EIA expected to address these topics. TOR of SIA to include headings project description, mining process (describing also sediment collection and discharge, also in mid-water column).

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31	IV D	van der Grient, Jesse	DOSI	It is unclear how CSIRO will be able to develop an EMMP for NORI-D as the data from the baseline studies and collector test will be available too late for the timeline set by TMC/NORI. That is, CSIRO has stated they need 2 years, while TMC/NORI have indicated to submit their application for a commercial license in the second half of this year (2023), most likely July. However, is the EMMP needed for this application? The timelines for the various components of the application (this SIA, the EMMP, the data analyses, the EIS) seem unaligned and rushed, all in order for TMC/NORI to make their self-imposed deadline. What is the purpose of this, and how will Prizma ensure quality of this SIA given these pressures and limited data availability?	Comments and opinions noted. Parts of the SIA study, such as potential impacts on fisheries, will dependent on the analysis generated by the EIA (and associated studies). Other parts, such a labour issues on ships also identified in other comments, can proceed independently of the EIA. Prizma notes that, due to lack of Affected Local Communities at NORI-D's DSM site, the time required for field works/baseline data collection would be shorter compared to land-based mining activities, although time will also need to be allocated to integrate traditional knowledge and relatively unique DSM topics, such as underwater cultural resources. Ultimately, NORI is expected to submit a combined and high quality EIS. Prizma continues to plan to deliver a high quality SIA input for the EIS, and will continue to request the required inputs and resources required from NORI to enable Prizma to deliver. Gaps/recommendation and/or uncertainties will also be identified.	TOR to include topic/heading uncertainty, traditional knowledge, and underwater cultural resources.

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31	IV D	van der Grient, Jesse	DOSI	There are currently no established environmental impact thresholds established. Is TMC/NORI here assuming they will set the thresholds? Based on what? How is this 'digital twin' going to work in this case? For suspended sediments alone, the thresholds may be low (van der Grient & Drazen 2022).	Comments and citations noted. The EIA is expected to cover these topics. The SIA scoping document notes that TMC has entered into a research funding agreement with a consortium of institutions led by Australia's Commonwealth Scientific Industrial Research Organization (CSIRO). These institutions are tasked to create a framework for the development of an ecosystem-based management and monitoring plan (EMMP) for NORI-D. - CSIRO's work, which includes certainty and risks, was presented during a side event of the ISA Council meeting in November 2022 in Jamaica. The presentation slides can be accessed here: https://metals.co/download/238783/?tmstv=1667848562. SIA will also develop rating for significance of social impacts, typically within bands, heatmaps or thresholds, such as negligible, minor, moderate, or major, as illustrated in the SIA scoping document.	Topic in comments, including thresholds for sediments, to be defined in the EIA. TOR of SIA to include heading/topic of uncertainty, and define criteria/threshold for rating significance of social impacts.
31	IV D	van der Grient, Jesse	DOSI	What is 'up to a percentage'? This is a statement that cannot be evaluated. Further, there has not been any data shown that these nodules can act as stepping stones. Further, several impacts, such as noise, light and suspended sediments (and deposition) can still impact those stepping stones, so how are these really going to be functioning as stepping stones and maintaining connectivity?	The sentence should read: "...up to a certain percentage". - The SIA scoping document notes that NORI-D's contract area is approximately 25,160 square kilometers. The monitoring outcome of the integrated Collector Test will help determine what percentage of this area may need to be designated as Preservation Reference Zones (PRZ). It is currently assumed that this may range from approximately 10 – 14 percent of the contract areas, representing all biotopes within the NORI-D area. The EIA is expected to provide additional details about the topics identified in the comments.	EIA to speak to the topics. - TOR for SIA to include topic APEI, PRZ and closure (include high level summaries).

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31	IV D	van der Grient, Jesse	DOSI	NORI should not worry about the size of the CCZ, and instead focus on their area. Of course NORI-D is going to be smaller than the CCZ. TMC/NORI ought to show that the biological communities present in NORI-D are similar to APEI and that there is connectivity between NORI-D and the APEI should they wish to continue to use this argument.	Opinion noted. ESIAs following GIIP consider project-related impacts across the potentially affected land/sea-scape. In the context of NORI-D, and its connection to the CCZ. APEI and connectivity are expected to be covered by the EIA.	TOR to consider land/sea-scape context and include APEI, PRZ and closure.
31	IV D	van der Grient, Jesse	DOSI	There are no studies investigating the recovery or resilience of pelagic communities in the CCZ, so where is this statement of years to decades based on? The recovery of seafloor communities is more likely to take decades to centuries. There is also no uncertainty around the recovery of fauna that requires the nodules as habitat – they will not recover without the hard substrate. This is limited by the amount of hard substrate, so removing that will not result in complete recovery, it will at most result in partial recovery related to what is left behind.	Impacts and/or recovery of pelagic communities is an environmental impact that is expected to be included in the EIA. Related social impacts to be covered in the SIA study.	EIA expected to cover these topics. TOR for SIA to include closure.

Page	Section	Author	Org.	Comment	Response	Action
31-32	IV D	Jackson, Julian	Pew	Appreciate that NORI has partnered with many research and academic institutions to study the seafloor and water column. Establishing baseline knowledge is essential to understanding this relatively unexplored area and will be important to monitoring and adaptive management should mining proceed in the future. The document claims that the APEIs established as “no mining zones” will act “as refugia and provide repositories of genetic diversity representative of the CCZ”. The network of APEIs are indeed an important part of protecting the seabed and are integral to regional environmental management. However, claiming the APEIs as refugia may be premature. According to the report for the Deep CCZ Biodiversity Synthesis Workshop held in 2019 (https://isa.org.jm/files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_ -_final), “the current network of APEIs broadly represent the climate hazards across the entire region” and “APEIs 4 and 6 may be the climate- change refugia” (p. 37, note use of word “may”). Further, due to a lack of taxonomic data, “important variables in the development of REMP such as biogeographic comparisons of species ranges to determine if APEIs could act as refuges is impossible.” (p. 161)	Comments noted. Deep sea biodiversity is an issue which are expected to be addressed in the EIA. As noted in the SIA scoping document, the selection of APEIs is detailed by ISA on its website. By December 2021, a total of 13 APEIs were designated pursuant to the ISA’s Regional Environmental Management Plan for the CCZ7, representing 1.97 million km2 of protected seabed. This means that approximately 43% of the CCZ is protected. The SIA to include high-level findings and discussion from APEI from the EIA, and use the appropriate term "may" or "will".	The EIA is expected to cover this topic in greater details. - The TOR for SIA to include topic biodiversity (revisit the topic of APEI).

Page	Section	Author	Org.	Comment	Response	Action
32	IV E	Jackson, Julian	Pew	The scoping document says "*Prior research indicates...biomass...are expected to recover naturally over years to decades".* The SIA should cite that research. Our understanding is that recovery will take multiple decades, possible millennia. See Simon-Lledo et al (2019, https://www.nature.com/articles/s41598-019-44492-w) which states effects from a simulated deep-sea mining experiment were noted 26 years later. Further, "*nodule removal will also alter the character of the seafloor habitat for the very long-term (i.e. thousands of years)".* The scoping document also notes that a post-test long term monitoring plan for the IRZ will be submitted with the application for exploitation. More information on NORI's closure and monitoring plans would be helpful to assess social and economic implications.	Noted. The EIA is expected to cover this topic in greater details, also for closure section, and provide references. It is Prizma's understanding that the recovery depends on numerous factors and can vary greatly for different receptors. The SIA will refer to/use the relevant findings/references and avoid overstating speed of recovery and note also associated variables and/or uncertainties.	The EIA is expected to cover this topic in greater details and provide references. - TOR of ISA to include topic/ heading biodiversity (and provide accurate characterization of recovery/closure.
33	IV E	van der Grient, Jesse	DOSI	Based on the limited data provided by TMC/NORI in their final submitted version of the collector test EIS, it indicates that the IRZ and PRZ are not similar in biological communities, and thus that limits the identification of and differentiation between natural variability and mining impacts. So far, TMC/NORI have not addressed this. How can the EMMP be submitted with the application for an exploitation license when CSIRO already indicated in talks that they won't be finished by then? What kind of EMMP will be submitted?	Noted. The EIA is expected to cover these topics, and provide assumptions, data and/or references. The SIA to include high-level summary about closure as developed by the EIA team.	The EIA is expected to cover these topics. - TOR of ISA to include topic/ heading biodiversity and closure (and provide high-level characterization from EIA).

Page	Section	Author	Org.	Comment	Response	Action
35	V C Table 5	van der Grient, Jesse	DOSI	No negative impacts on fishing or cultural values listed.	Noted. Livelihood noted in the table covers also fishing and other forms of livelihood. Cultural values not explicitly stated in Table 5, but detailed in section on PS7 (Indigenous People) and PS8 (Cultural Heritage), pages 50-52. Annex 5 also contains a section on Culture and Customs, indicating Important cultural connection of Pacific islander with the ocean and its environs, and that no significant changes or impacts expected from the Project. A preliminary application of the IFC PS suggested that PS7 and PS8 were not triggered for NORI-D's DSM aspects. Prizma notes that further engagement activities, including in Nauru and Fiji, are planned, to further explore these topics. Also, underwater cultural heritage will also be included in the SIA.	TOR of ISA to include topics/headings fishing, culture, underwater cultural heritage, and traditional knowledge and study as part of the SIA.

Page	Section	Author	Org.	Comment	Response	Action
35-37	V Feasible Alternatives	Jackson, Julian	Pew	No project' - add no risk of disrupting ecosystem services (e.g. fisheries, climate regulation), no risk of losing marine genetic resources, no risk of transboundary harm to adjacent coastal States, more incentive for policy reform of existing and planned land-based practices and for innovation of both recycling and batteries technology to continue to reduce metal demand projections .	Prizma would refer the commentator to the counterfactual case. IPCC's predictions about oceans notes that GHG emissions have already and are expected to continue to cause ocean warming, acidification, and oxygen loss. These contribute systematic threats to biodiversity with or without NORI-D project. A recent Science article cited suggests that 'no action' may further exacerbate Climate Change impacts, with the marine systems likely experience mass extinctions on par with past great extinctions. While the monitoring and other data collected during the collector test can be expected to speak to Pew's concerns about ecosystem services, genetic resources, and transboundary harm, topics such as policy reforms and innovation would appear to be largely - if not fully - driven by context and factors which are independent of NORI-D. Prizma also notes that several authoritative studies cited, such as those of the IEA on the Role of Critical minerals in Clean Energy Transition, include projects under different climate and technological innovation scenarios, and continue to show need for materially larger volumes of critical metals.	The TOR to include topic/heading to include alternative (and incorporate the no project options).
64	IX B	van der Grient, Jesse	DOSI	ISA contractor observations are not the best data available to determine whether fishing occurs in the CCZ. First, these data are not presented here. How often did they see ships? Was this noted down? Over what time period did NORI look? Second, there are better data out to determine this, like from the Regional Fisheries Management Organizations and the United Nations Food and Agriculture Organization, both have data that show fishing does occur. In addition, the first estimates of the overlap between the industries have already been done (https://doi.org/10.1016/j.marpol.2021.104564).	Noted. Impacts to fisheries are included in the EIA, including use of additives and impacts to mid-water wildlife or organisms that may, in turn, impact fisheries. Related ecological and/or fishery impact issues that are relevant to ESS and socioeconomic impacts will be addressed in the SIA.	TOR to include topic/heading methodology and references, and SIA analysis to use best available data/publications.

Page	Section	Author	Org.	Comment	Response	Action
64	IX C	van der Grient, Jesse	DOSI	How can NORI test suspended sediment plume effects in the midwater when no data were collected on metazoan such as zooplankton, micronekton and gelatinous communities, for which environmental baseline data were collected? And since these data are absent, it is impossible for NORI to determine the socio-economic effects of midwater sediment plumes.	The SIA scoping document highlights that, for the recent EIS collector test, aboard a dedicated monitoring vessel, marine experts and academic scientists conducted the first monitoring program of an integrated pilot collector system test. Remotely Operated Vehicles and Autonomous Underwater Vehicles were used to survey, monitor and sample the sediment plumes generated by collector operations on the seafloor as well as the mid-water discharge of water from the riser system used to transport nodules from seafloor to the Hidden Gem. Over 40 subsea sensors on seafloor landers and mid-water moorings were deployed to continually monitor sediment plumes and noise generated by the nodule collection operations. The ongoing monitoring program will continue to survey environmental impacts and collect scientific data after the conclusion of the collector system test. The EIA is also expected to consider engineering solutions available to minimize the magnitude of potential impacts from the midwater plume. Further details and a characterization of the impact of sediment plumes are expected to be covered in the EIA.	TOR of the SIA to include heading fisheries, and consider impact analysis of sediment plume to be conducted as part of the EIA
64	IX B	Jackson, Julian	Pew	This section notes that the sediment plumes generated at the sea floor and in the midwater column will be monitored during the collector test and that “such linkage to socio-economic receptors will be a focus of the SIA”. This will be key information in determining effects to the environment and to fisheries. More information on how this data will be collected and analyzed would be appreciated. It is not clear what the linkage between plume generation and “socioeconomic receptors” is.	Comments noted. The EIA is expected to cover the impacts from sediments on the sea floor and discharge. After the data analysis for the Collector Test has been completed, potential impacts to, for example, fisheries will be better understood. This, in turn, will allow the SIA to determine related socio-economic impacts, if any, and propose mitigation measures, if required.	The TOR to include topic/heading methodology, baseline studies, fisheries, socio-economic impacts (which will contain the requested information).

Page	Section	Author	Org.	Comment	Response	Action
64	IX C	Jackson, Julian	Pew	The SIA should also consider effects to: Provisioning ESS: Pharmaceuticals and biomaterials Cultural ESS: Existence values, option use values, stewardship values, aesthetic values - there are likely many cultural reasons to protect the deep sea beyond science and education (although those are important too) Under Regulating and Supporting ESS the document notes potential positive effects, however there are also potential negative effects given the disruption mining will cause to the environment (including negative impacts to charismatic mega fauna - noise) and other highly migratory species of concern).	Feedback on ESS is noted and citations will be reviewed and considered in the SIA.	TOR to include topic/headings stakeholder engagement, fisheries (ESS), migratory marine species, traditional knowledge, pharmaceutical, biomaterials, and diverse cultural values
64	IX C	Jackson, Julian	Pew	Levels of uncertainty should also be highlighted. The CCZ is still a relatively unexplored area with the degree and longevity of effects still unknown. Consider consulting Le & Sato 2017 (https://www.ocean-climate.org/wp-content/uploads/2017/03/ecosystem-services-deep-ocean_ScientificNotes_Oct2016_BD_ppp-9.pdf) and Thurber et al 2014 (https://bg.copernicus.org/articles/	Comments and citations noted. The SIA scoping document notes that TMC has entered into a research funding agreement with a consortium of institutions led by Australia's Commonwealth Scientific Industrial Research Organization (CSIRO). These institutions are tasked to create a framework for the development of an ecosystem-based management and monitoring plan (EMMP) for NORI-D. CSIRO will collaborate with researchers from Museums Victoria, Griffith University, and the University of the Sunshine Coast in Australia, as well as the National Institute of Water and Atmospheric Research (NIWA) in New Zealand. As also noted in the SIA scoping document, the CSIRO's work, which includes the notion of (un)certainty and risks, was presented during a side event of the ISA Council meeting in November 2022 in Jamaica. The presentation slides can be accessed here: https://metals.co/download/238783/?tmstv=1667848562.	TOR to include topics/headings methodology and uncertainty.

Page	Section	Author	Org.	Comment	Response	Action
64	IX C	van der Grient, Jesse	DOSI	The collector test will not give you information regarding the impacts to fisheries as the required data were not collected. This claim can therefore not be included in the SIA. Further, the discharge duration of the midwater plume of the collector test was so short it will not give you reliable information to inform fisheries impacts from commercial licenses. The concentration of the generated midwater plume was lower than planned because of issues with material and therefore is also not reliable or informative to make any conclusions regarding fisheries impacts.	Comment noted. The EIA and SIA will address fishery impacts, and are expected to include data from multiple sources, in addition to any data collected during the collector test. Any material data gaps and uncertainties affecting the analysis for the SIA will be identified. Monitoring programs will also be developed.	TOR to include headings/topics baseline, methodology, uncertainty, fisheries, and monitoring (and speak to concerns about concerns noted in comments).
65	IX	Helen Russell	S4ASP	Page 65/Section IX. Impacts to be Described or Studied in SIA, C. Other Social Effects Linked to ESS: Comment for this sentence: Selected ESS are also highlighted in other IFC Performance Standards, such as PS-3 (climate change aspects); PS 4 (Community Health and Safety); PS-5 (possibly for land-based activities); PS-7 (natural resources important to Indigenous Peoples); and PS 8 (cultural heritage). Balloon comment added*: this text should refer to sea-bed based ecosystem services as well such as oyster beds, seaweed beds, shrimps) and might need future-proofing and to make a statement on limiting excessive levels of mining in one specific location, either temporal limits or spatial limits depending on the ecosystem sensitivity/seasonal changes/breeding seasons. etc.* - Subsequent correspondence highlights also need to consider the differing values attached to biodiversity and ecosystem services by Affected Communities, as per IFC PS/GN.	Comments noted. It is agreed that ESS is a cross-cutting theme in IFC PS (as also noted on page 65 of the SIA scoping document). Planned engagement activities, also in Nauru and Fiji, are expected to help provide additional color on different value judgements applied by different stakeholders. Using IFC PS as benchmark (as required under the ISA's emerging regulatory framework), considering the distances of many hundreds to thousands of kilometers, and the impact data available to date, the preliminary screening detailed in the SIA scoping document on pages 49-52 does not suggest the presence of Affected Communities (as per IFC's definitions) in the DSM component of the Project. However, the applicability of PS 7 and PS8 will need to be revisited and validated once further data will become available relating to, for example, the effect of sediment plumes or other impacts which will be assessed during the pilot Collector Test and the Project's ESIA, and/or siting decisions for onshore facilities.	TOR to include topic/headings traditional knowledge and engagement and consultation, use applicable standards (IFC PS), all of which are expected to provide additional insights on different values and the presence/absence of Affected Communities.

Page	Section	Author	Org.	Comment	Response	Action
68	IX G	van der Grient Jesse	DOSI	Besides illegal fishing operations, you can consider legal fishing operations.	Noted.	TOR to include baseline studies, valued social components, and fishing.
68	General Comments	Mironenko, Olga	EnvSci	The components to also look at would be: Impact on benthic and nodule-inhabiting marine life; damage to mankind of the present and of the future, Potential of fisheries collapse; Potential collapse of tourist industries, Environmental impacts of deep-sea mining, including the study of noise pollution, heavy metal pollution of the water column, sediment plume impact on the benthic life in the mining zone and around it.	Noted. While key topics included in these comments are expected to be covered in the EIA, notions such as "damage to mankind, future and present" would be linked to the concept of Common Heritage of Humankind (already considered to be part of the regulatory context linked to UNCLOS/ISA), and will be addressed in SIA. In line with ISA's requirements, the EIA/SIA will also cover the topics fisheries and tourism.	TOR to include topic/headings valued social components, fishing, tourism, benefit sharing.
69	IX	Helen Russell		Should an additional section be included here which provides some basis for informing the value judgements (in line with the IMO and other relevant international standards) on a Go/No-Go decision? My feeling on deep-sea mining is that there may be valuable to include either potential scenarios or a list of marine natural resources/ecosystems which are too unique/valuable to risk contaminating or the climatic risks are too unpredictable that we couldn't guarantee safeguards/rights (seems that we are having 100-year storms pretty frequently these days).	We plan to continue to engage with a diverse group of stakeholders, which - we expect - will attach differing values to various valued social components. "Go/No Go" examples of commitments to avoid certain areas for land-based mining include World Heritage Sites. As noted in the SIA scoping document, the ISA has already identified approximately 43% of the CCZ as Areas of Particular Environmental Interest (APEI), which are such "No Go" areas for deep-sea mining activities. The EIA is expected to provide additional information about thresholds and uncertainties which may drive such "go/no go" decisions for NORI-D.	EIA expected to identify unique ecological features or thresholds and uncertainties. TOR for SIA to include heading or topic identification of valued social components and methodology.

Page	Section	Author	Org.	Comment	Response	Action
70	X	Helen Russel		Methodology For Impact & Risk Assessments/Table 13: Draft ISA Template for a Table of Content of an EIS, 10. Accidental events and natural hazards: I would separate out the accidental spills from the natural hazards and create two different sections here as they will likely has specific responses. The accidental spills section will obviously require very robust defences and several layers to eliminate the risks of contamination as far as possible and specify appropriate layers of defence for each activity/intervention which has the potential to create leakages (using drilling machinery holds different risks to sea-based refueling for example) Natural hazards feels as though this could have it's own guidance manual! especially as it is likely that both intensity and frequency of natural weather events will only increase in future, however, the proponent does not have any influence over. e.g. One section of risk minimization and management strategies (e.g. worker safety which is controlled by the company) and the other section can focus on appropriate responses to climate related/weather events.	While comments are noted, it may be useful to point out that the former oil drilling ship has been converted to collect nodules, and the Project does not involve oil and gas development-type drilling activities. Nodules will be collected from the seafloor without use of explosives, drilling etc. common to land-based mining activities. The risk from fuel spill will still need to be considered, and that risk profile and required mitigation is not as extensive as would be expected for off-shore oil and gas developments, production and transport, which may be implied in some of the references to IPIECA, etc. - Relevant ERP are also published in Section 10 HAZARDS, MITIGATION & EMERGENCY RESPONSE PLAN in the Collector Test EIA (available here: https://metals.co/nori/, scroll down to: NORI D Collector Test EIS – Revised Final Submission – Resources), and will also be described in the EIA/SIA.	The TOR for SIA to include heading regulatory requirements, applicable standards and guidelines (also health and safety), and emergency response.

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81-85	Annex 5	Jackson, Julian	Pew	There should be an equivalent table of changes induced by seabed mining that could lead to social impacts and risks, which should address many of the concerns/impacts we have raised throughout this submission.	Noted. The SIA scoping document already considered and screened numerous social risk indicators which can be applied to diverse sectors, also DSM (1. Economy, income, and security, Bribery, Thefts and accidents, Inequality, Social tension, Poverty;, 2. Employment and education, Employment Skills & education, Child/Forced labor, Poor working conditions, Lack of freedom to organize, Temporary jobs, Unemployment; 3. Land use and territorial aspects, Infrastructure, Expropriation or Displacement, Access to land; 4. Demography, Population growth, Gender imbalance, influx, Inflation; 5. Environment, health, and safety, Water use competition, Health impacts, Environmental impacts affecting health; 6. Human rights, Human rights abuses, Culture/aesthetic resources, Stakeholder inclusion, Discrimination, Indigenous rights; - see also Annex 6, pages 86-86) and applied these to the NORI-D Project. The preliminary analysis suggests that NORID's DSM activities have a comparatively small *social risk profile* when compared to the mining sector. This lower social risk profile is largely linked to its remote, off-shore location, with the nearest communities located over a thousand km away.	TOR to include heading unique attributes, fisheries and tourism (livelihoods), traditional knowledge, stakeholder engagement and consultation, uncertainty, and SIA to also add 1-2 other comparison tables, using other types of off-shore developments.
89-91	Annex 7 ESS	Jackson, Julian	Pew	Note specific comment for page 64	Noted and addressed there.	TOR to include relevant topics or headings.

Page	Section	Author	Org.	Comment	Response	Action
	Annex 7	Dobush, Bobbi-Jo	OF	Ecosystem Services: DSM operations may negatively affect ecosystem service (including heat and carbon sequestration) provided to humans by the deep ocean	These topic are expected to be evaluated as part of the EIA, and Prizma's table can be updated, if required. - It is noted that the baseline conditions/background and scale or significance of potential Project-related impacts should consider IPCC's predictions about the oceans, which describes that GHG emissions from human activities have already and are expected to continue to cause ocean warming, acidification, and oxygen loss. These contribute to systematic threats to biodiversity and ESS in the oceans (with or without NORI-D). A report by the IPPC finds that 99% of the world's warm-water coral reefs could disappear if global average temperatures rise by 2°C or more above pre-industrial levels.	EIA expected to provide relevant data and analysis. TOR of SIA to include heading/topic Climate Change or GHGs (covering also carbon sequestration), and provide high level summary.
Annex 7	90	Mironenko, Olga	EnvSci	'waste decomposition/detoxification' is claimed to not be applicable or significant for DSM site in CCZ. Not true, as this completely disregards the often-raised issue of heavy metal poisoning of the entire water column by taking up the sediment.	ESS and such environmental issue/impact ('waste decomposition/detoxification') are expected to be addressed in the EIA. - The preliminary review presented in the Annex 7 table implies that, in general, considering the location of the nodules and the scale of oceans, the impacts from the Project on waste decomposition, detoxification is "Not applicable/significant for the DSM site in the CCZ", and, in terms of socio-economic receptors, "Not applicable to deep sea PMN collection site in the CCZ (ocean)". The EIA is expected to characterize the environmental impacts using data collected during the pilot collector test system and other sources. This analysis can be considered to determine the need to update the information in Annex 7 for the SIA.	EIA expected to provide relevant data and analysis. TOR of SIA to include headings/topics valued social components, fisheries, tourism, engagement and consultation (covering also ESS).

Page	Section	Author	Org.	Comment	Response	Action
Annex 7	90	Mironenko, Olga	EnvSci	'ii tourism, recreation, hunting, fishing' is also said to be 'not applicable or significant for the DSM site in CCZ'. Fake fact as well. This also completely disregards all presently available science confirming the connectivity of species across the entire oceans with the larvae transport. Wiping out a piece of the sea bottom might break this connectivity. This also omits potential impact on tourism for countries such as Mexico and the Pacific Island States. Potential noise pollution can change migration patterns and routes of marine mammals, which can and will impact economies such as Baja California, which lives off tourism for whale-watching.	Opinions and comments noted. As per ISA's draft EIS templates, sections related to tourism and fishing are expected to be included in the EIA/SIA.	EIA expected to provide relevant data and analysis. TOR of SIA to include valued social components, fisheries, tourism, migratory marine species, traditional knowledge, engagement .
Annex 7	90	Mironenko, Olga	EnvSci	'iii scientific exploration, education - furthering scientific knowledge of the deep oceans' is impossible when one is wiping out the study objects. Studying ecosystems is completely impossible in the process of destroying these ecosystems, let alone unethical.	Opinion noted. The total NORI-D's contract area is approx. 25,160 km2 (or 0.56% of the CCZ) and could potentially be mined over a period of decades. Approximately 10-14% of the contract areas would be expected to be set aside for preservation. This compares to approximately 4,500,000 km2 comprising the CCZ. The ISA has already designated approximately 1,900,000 km2 or over 43% of the CCZ as "no mining" areas. The size of the protected "no mining" area within the CCZ is over 75 times the size of the NORI-D contract area. In addition to baseline data which has been collected to date within the NORI-D area, it would be reasonable to expect that - even with mining activities within the NORI-D contract area which would likely last decades, there would be areas available for deep-sea science research, in addition to the designated APEIs, and areas within the CCZ which are being explored but would not feature mining activities for a long time.	TOR of SIA to include headings/topics valued social components, and scientific research and capacity building.

Page	Section	Author	Org.	Comment	Response	Action
Annex 7	90	Mironenko, Olga	EnvSci	[iii] Another consideration to take into account here is the conscious deprivation of the future generations of a chance to do deep-sea science by mining the ocean bottom and turning it into a desert for centuries or thousands of years.	As noted above, NORI-D's area is approx. 25,160km2 (or 0.56 percent of the CCZ) and could potentially be mined over a period of decades. Approx. 10-14 percent of the contract areas would be expected to be set aside for preservation. This compares to approximately 4,500,000 km2 comprising the CCZ. The ISA has already designated approximately 1,900,000 km2 or over 43% of the CCZ as "no mining" areas. The size of the protected "no mining" area within the CCZ is over 75 times the size of NORI-D. In addition to baseline data which has been collected to date, it would be reasonable to expect that - even with mining activities within the NORI-D's area (which would likely take decades), there would be areas available for deep-sea science research, in addition to the designated APEIs, and areas within the CCZ which would not be expected to feature mining activities any time soon. the foreseeable future.	TOR of SIA to include headings/topics valued social components, and scientific research and capacity building.
Annex 7	91	Mironenko, Olga	EnvSci	'ii pathways for genetic exchange – N/A' – fake fact. This statement does not hold up, since marine scientists have been pointing out in numerous studies that in benthic marine life there is a pattern of connectivity spanning entire oceans. This means that eliminating the substrate for growth and development of this life on the plot of the sea bottom may disrupt the habitual pattern of larvae transport and organisms' horizontal migration.	Comments and opinion noted. The EIA is expected to characterize the ecological impacts of the NORI-D Project.	TOR of SIA to include VSCs, and SIA expected to include a high level summary of key ESS impacts.

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94	Annex 8	Jackson, Julian	Pew	“Addition of mortality to a wildlife population” implies that because 42% of the CCZ is protected under APEIs, the project will not reach significant livelihood threshold levels. More evidence needs to be given on this account, especially taking into account the CCZ’s high biodiversity levels	Noted. The SIA scoping document notes on page 94 the following: "Some aspects may have relevance to livelihood-related ecosystem services, incl. cultural significance of migratory species, if indicated by the Collector Test/EIA. Given size and location of CCZ, of which 42% protected, cumulative social/ESS impacts not expected to be discrete or reach significant livelihood threshold levels. Siting of onshore/processing facilities unknown, future analysis required." Prizma notes that TMC has entered into a research funding agreement with a consortium of institutions led by Australia’s Commonwealth Scientific Industrial Research Organization (CSIRO). This work covers (un)certainty and risks, and is expected to help define thresholds. CISRO's presented on its planned work during a side event of the ISA Council meeting in November 2022 in Jamaica. The presentation slides can be accessed here: https://metals.co/download/238783/?tmstv=1667848562. SIA will also develop ratings for significance of relevant social/livelihood impacts, typically expressed in bands, heatmaps or thresholds.	EIA to characterize impacts (such as wildlife mortality), and provide insights on thresholds and uncertainties. TOR of SIA to include fisheries (livelihoods), methodology (covering significance and thresholds), and uncertainty.
	Webinar	Anon.	Anon.	700km is no distance at all for impact to travel by sea....	Comment noted. The distance of 700km is to the Island of Clarion (uninhabited except for a naval base), while the nearest land mass (Mexico) is at distance of approx. 1,700 km. The prediction of environmental impacts and areas of influence (distances of impacts) will be covered in the EIA and inform the SIA, which will also need to identify social areas of influence (and relevant distances).	EIA to characterize impacts and distances involved. TOR of SIA to include livelihoods, such as fisheries and tourism.

Page	Section	Author	Org.	Comment	Response	Action
	Webinar	Anon.	Anon.	Is there an early estimate of what the impact has been on the seabed environment?	The EIS studies to cover impact on the seabed environment.	TOR to include heading or topic closure (describe expected impact)
	Webinar	Anon.	Anon.	How do you assess the long term effects on the life of the ocean from the detrimus that is dumped during this process?	The EIS studies to assess the long term effects on the life of the ocean from the sediment plumes generated and discharged from NORI-D's DSM activities.	EIA to characterize impacts. TOR of SIA to include topics/headings related to livelihoods, such as fisheries and tourism.
	Webinar	Anon.	Anon.	Have you seen the recent video that showed waste being dumped directly into the ocean, and what would be the social impacts on Pacific Islanders who depend on fish be?	Yes, Prizma's team viewed the referenced clip and TMC's response. According to TMC, the event involved an overflow of seawater mixed with a small amount of sediment and nodule fragments, which contain no toxic levels of heavy elements, and which did not have the potential to cause harm to the marine environment. NORI notified the regulator (ISA) of the event after it occurred. A further update on the event and the mitigation measures implemented to prevent it from occurring again was presented by NORI to the ISA during the ISA's inspection and audit visit to the Hidden Gem at demobilization. - TMC's short clip showing and describing the event and follow-up can be accessed here: https://metals.co/cyclone-separator-overflow/ - the short clip circulated by MineWatch (and others) can be accessed here: https://youtu.be/gJ2mAOhbAG4	The TOR to include a section/heading stakeholder engagement and consultation (to also include grievance mechanisms), and monitoring indicators (covering also reportable events and grievances)

Page	Section	Author	Org.	Comment	Response	Action
	Webinar	Anon.	Anon.	Why wasn't the recent video leaked by scientists on the Hidden Gem of pollution and sediment plumes from the tests in the CCZ be disclosed to investors in the recent corporate update and why wasn't this shared at the ISA Council meeting in November 2022? Further to this where are the TMC's videos of this event start to finish and where are their detailed notes? It is not good enough for TMC to claim that this was a "a minor overflow" and this was not a "reportable incident". For those who haven't seen the videos please see here: https://twitter.com/stefanlabbe/status/1612989872990600 34/	According to TMC, the event involved a minor event comprising an overflow of seawater mixed with a small amount of sediment and nodule fragments, which contain no toxic levels of heavy elements, and which did not have the potential to cause harm to the marine environment. NORI notified the regulator (ISA) of the event after it occurred. A further update on the event and the mitigation measures implemented to prevent it from occurring again was presented by NORI to the ISA during the ISA's inspection and audit visit to the Hidden Gem at demobilization. - TMC's short clip showing and describing the event and follow-up can be accessed here: https://metals.co/cyclone-separator-overflow/ - the short clip circulated by MineWatch (and others) can be accessed here: https://youtu.be/gJ2mAOhbAG4	The TOR to include a section/heading stakeholder engagement and consultation (to also include grievance mechanisms), and monitoring indicators (covering also reportable grievances)
	Webinar	Anon.	Anon.	We know the recovery of terrestrial ecosystems after the cessation of mining occurs within decades to hundreds of years as opposed to thousands or millions of years for deep sea mining. Isn't this a fundamental difference between terrestrial mining and deep sea mining? Doesn't this place deep sea mining as potentially a far more severe category of environmental impact that land-based mining with real social impacts for Pacific communities? How do you respond to the visual investigation Blue Peril that predicts how far-reaching impacts would be in the Pacific Ocean? [The Blue Peril video and documents can be accessed here: https://blueperil.org and here: https://dsm-campaign.org/wp-content/uploads/2022/09/Blue-Peril-Technical-Paper.pdf]	The EIA is expected to cover environmental impacts of NORI-D, including the predicted extend of impacts from sediment plumes, and the topic of closure. The resulting data will also allow an analysis of related social impacts for Pacific communities, which are located many hundreds to thousands of kilometers away from NORI-D's Project. Prizma also notes plans to conduct stakeholder engagement and consultation in Nauru and Fiji in Q2/2023. These are expected to identify opportunities and/or concerns related to the NORI-D Project.	EIA expected to assess env. impacts. TOR for the SIA to include sections/headings valued social receptors, fisheries and tourism (livelihoods), stakeholder engagement and consultation.

Page	Section	Author	Org.	Comment	Response	Action
	General	Zandvliet, Luc	TRA	The report makes several references to the fact that the process does not include any tailings. But that begs the question what impacts are related to the on-shore process. The report indicates these impacts will be excluded from the SIA and that assessments of such impacts will be provided by the national legislation of the processing facility. Although I understand that the logic, it leaves the reader rather unsatisfied. I would suggest to at least commit to conducting an ESIA against international standards once the on-shore facilities have been determined.	The unique characteristic of nodules in the CCZ means that no waste rock, guange, or related tailings materials commonly associated with land-based mining of battery metals is expected. This also means that there will be no need for a related tailings management facilities, common to land-based mining. The SIA to include TMC's processing flow sheet and waste streams. - SIA scoping document notes that onshore facilities fall outside the jurisdiction of the ISA. It is expected that TMC and NORI will commit to meeting applicable host country regulatory requirements, as well as the IFC Performance Standards and Equator Principles. In addition, social (and other) due diligence and/or assessments are expected to be applied for brownfield facilities.	TOR to include heading regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.

Page	Section	Author	Org.	Comment	Response	Action
	General	Jackson, Jesse	Pew	While this report and the comments outlined below are primarily about the impacts from the harvesting/mining of nodules in the deep sea, the shipment to and processing of nodules on land will have a different set of societal impacts. Details about how the nodules will be processed on land should be outlined in greater clarity in order to have a fuller understanding of the life cycle of the project.	The SIA scoping document notes in Section D. Product Stewardship, that the SIA will provide a brief description of relevant product stewardship aspects related to the Project. This means a brief description of transshipment of nodules from the collection site to onshore and – likely - "brownfield" port and warehousing facilities, and onwards transshipment for, at least initially, processing by existing "brownfield" RKEFs. It is assumed that any future construction of nodule processing facilities will be subject to their host country regulatory and permitting requirements (and not the ISA), and would also be expected to be designed to meet Good International Industry Practice (for example, the IFC Performance Standards and Equator Principles, as may be applicable). Typically, mining project ESIAs do not include the full life cycle of the concentrate (meaning all future sales or processing options), only highlighting - in general - that their products will be sold to international markets. The ISA's focus is also on the DSM aspects of the project, expecting only a short section on the "Product Stewardship" aspect of the Project.	TOR to include heading regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.

Page	Section	Author	Org.	Comment	Response	Action
	General	Jackson, Jesse	Pew	The scoping document posits that more metals will be needed to avert the climate crisis, and that seabed mining could be a source of metals that avoids the many impacts land mining has to terrestrial environments. However, in its many comparisons between land based and deep sea mining, the document does not make clear to what extent seabed mining would actually *offset* any land projects. It seems likely that instead of *offsetting* , seabed mining will occur *in addition to* . If seabed mining is occurring in addition to land-based mining, offsets to terrestrial damage cannot be considered a benefit.	The SIA scoping documents highlights authoritative studies which describe the need for additional metals. IEA highlights the need for up to about 60 new nickel mines alone by 2030 to satisfy the growing demand. The scoping document does not suggest that NORI-D "offsets" or "eliminates" existing land-based mining operations (neither terms used in that context in the document). Instead, it seeks to compare the social risk of the two routes - land vs DSM - at arriving at the same metals. The SIA to further clarify this topic and terms used.	TOR to include topics project justification and demand for battery metals, clarifying the role NORI-D/DSM could play, avoiding term "offsetting")
	General	Jackson, Jesse	Pew	The comparisons between land-based and deep sea mining is also quite uneven throughout the document and few of the negative consequences of seabed mining are listed. In “Table 2: Comparing key aspects of generic land-based mines with NORI-D” the categories are listed such that NORI-D does not have a single negative consequence - despite evidence for many negative environmental and possibly social consequences. The same applies for “Table 5: Preliminary comparison of “With Project”, “No project” and “Counterfactual” scenarios. More evidence should be given for the counterfactuals. Please note our specific comments below for the many categories of impacts.	Opinions noted. While most concerns about DSM appear to focus on ecological issues, which are expected to be addressed in the EIA studies, the SIA will focused on social risks and opportunities (some of which may be linked to environmental impacts). The preliminary analysis presented in the SIA scoping document shows that the social risks of NORI-D's DSM activities are, relatively, much more benign when compared to land-based mining. This may explain the perceived "uneven" presentation in the SIA scoping document - the risk profiles of DSM and land-based mining are "uneven". We note that engagement activities are continuing to identify specific social concerns to be addressed in the SIA study (next phase). We also note that the qualitative presentation of the of "With Project" and "No Project" in Table 5 is common, to which the SIA team added "Counterfactual." This approach recognizes that "No Action" does not translate in no impact, but can be reasonably expected to result in impacts being shifted elsewhere.	TOR to include topic or heading unique attributes (or similar) and generate 1-2 additional comparison tables using offshore developments, such as oil and gas.

Page	Section	Author	Org.	Comment	Response	Action
		Zandvliet, Luc	TRA	The tone and style of the report are fine. At times though it reads as overly-pro deep sea mining, which slightly reflects on the credibility to the report. For example, the reference to Brumadinho and the Church of England requirements re: tailings reads funny when the report (rightly) acknowledges in various places that the environmental/biodiversity impacts of the project have yet to be determined. It is not bad to compare conventional mining verses deep sea mining but I would be weary using worst case scenario's in conventional mining as a justification for the project. I was not crazy about the comparison with Ambatovy either but found that table less worrying.	Noted. The common use of the term "Mining" in DSM, and direct substitute of DSM being land-based mining, highlights the value of comparing the key differences. No need for tailing facilities are important features of the NORI-D's Project. Ambatovy was selected because it is a large-scale Nickel and Cobalt mining and processing operation, was financed by numerous multilateral banks, which applies the IFC Performance Standards (or equivalent), and provides data visibility (not because Ambatovy is the "best" or "worst" operation). Prizma notes that the lack of tailings storage facilities or numerous other infrastructure, and/or social risk related to the presence/co-location with communities, Indigenous People, etc. applies also to mining projects in Canada or Australia. Their social risk profiles can be reasonably expected to be much larger compared to NORI-D, which lacks local communities, large workforce, etc. Prizma will add additional "comparison tables" involving other offshore developments to be added to the SIA study.	TOR to indicate adding additional comparison table/s with 1-2 other off-shore activities, such as offshore oil & gas development.

Page	Section	Author	Org.	Comment	Response	Action
		van der Grient, Jesse	DOSI	It also seems odd that this report seems insistent on using land-based standards for something that is not land based. It would benefit this effort to evaluate deep sea mining focused on deep-sea mining impacts and criteria, allowing for better evaluations. Right now, it seems like a comparison of oranges with apples. (A better comparison might be to dredge mining or deep sea oil drilling, where we know environmental consequences have sometimes been severe.)	The IFC Performance Standards and Equator Principles included in ISA's regulatory framework are not "land-based standards," and are commonly applied to marine-based projects.	TOR to indicate adding additional comparison table/s with 1-2 other off-shore activities, such as offshore oil & gas development.
		Mironenko, Olga	EnvSci	Presentation of the dangers of land-based mining is not scientifically valid unless seen in a comparison with the same criteria for the deep-sea alternative.	Opinion noted. Other comments received suggested the use of off-shore oil and gas , or dredge mining as an alternative way to compare NORI-D's social risk profile.	TOR to indicate adding additional comparison table/s with 1-2 other off-shore activities, such as offshore oil & gas development.
15	III D	van der Grient Jesse	DOSI	Further, with regards to resettled/affected communities – should NORI decide to use facilities that have already displaced/affected communities, is that considered as no effect on NORI-D as it already occurred, or will the industry that NORI-D delivers be considered as upholding such issues? Same for co-location with local communities.	This aspect will be reviewed as part of due diligence and/or assessment process for land-based facilities. Generally speaking, resettlement legacies would not be attributed to NORI-D but may still pose risks that may need to be evaluated.	TOR to include heading regulatory context/corporate policies, and describe social due diligence/assessment approach for land-based facilities.

Page	Section	Author	Org.	Comment	Response	Action
15	III D Table 2	van der Grient Jesse	DOSI	For completeness's sake, there should be factors considered here that are unique to the sea. It would be just as easy to create such a table focusing on just deep-sea mining impacts and ticking no for terrestrial mines in all the boxes. That would make terrestrial mines look good. For example, health, safety, and fatality risks at sea, affected fisheries, affected culture and values, conflict with other industries that use that area, migration routes of highly-migratory animals, multi-year presence of ships and ROV/AUVs (and noise), discharge of sediment plumes, oil spills, removal of fauna - it is not correct to focus on just flora -, restructuring of seafloor (for decades if not centuries), etc.	Comments and opinions noted.	TOR to include headings/topics of health & safety, fisheries, culture and values, socio-economic impacts (other users/industries). Other topics expected to be covered by the EIA studies.

Page	Section	Author	Org.	Comment	Response	Action
15	III D Table 2	van der Grient Jesse	DOSI	As TMC (or any of the other contractors) have no connection to land-based mining operations, this operation is and needs to be considered as an additional impact on nature, regardless of whether there is impact on terrestrial nature from land-based mining projects. It is not going to mitigate terrestrial impacts. Further, I see here no considerations for potential indirect negative pressure on terrestrial nature via increased competition in ores. Additional resources will likely affect the prices of metals on the market, and that could result in an increased production on land as companies want to maintain their profits. Further, that could have potential repercussions for people working in land-based mines. Thus, this exercise may provide no information at all regarding understanding social impacts of deep-sea mining – it is comparing apples with oranges.	The SIA scoping document seeks to compare the social risk profiles of land-based mining operations and NORI-D. The scoping document does not suggest that NORI-D would offset, stop or eliminate land-based mining operations, but that its relative social impacts appear to be much smaller. The SIA will not be completing an impact assessment for other land-based mining operations. Potential economic impacts on developing land-based producer states have already been conducted and will be used (and not duplicated or expanded) for the SIA, which is already mandated to address related impacts on states through an economic assistance fund.	TOR to include headings/topics focused on socio-economic impacts of NORI-D, and add 1-2 other comparison tables, using off-shore developments.
15	III D Table 2	van der Grient Jesse	DOSI	Again, for completeness's sake, that ought to be considered. Last, there is no consideration here for land-based activities involved in the NORI-D operation. For example, where are the ships going to be built, where are the port and processing facilities? As long as this is not identified you cannot reliably claim that NORI-D ticks 'no' in any of those boxes.	The referenced Table 2 identifies key social risk differentiators between land-based mining and NORI-D. Considering the mining aspects, there will be no multi-year construction of a mine, mine camp, transmission lines, etc., no co-location with locally affected communities (including no indigenous communities), and no risks of child labour at NORI's DSM operation in the CCZ, which is located hundreds to thousands of kilometers from its nearest communities.	TOR to include heading regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.

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15	III D Table 2	van der Grient Jesse	DOSI	For completeness's sake, there should be factors considered here that are unique to the sea. It would be just as easy to create such a table focusing on just deep-sea mining impacts and ticking no for terrestrial mines in all the boxes. That would make terrestrial mines look good. For example, health, safety, and fatality risks at sea, affected fisheries, affected culture and values, conflict with other industries that use that area, migration routes of highly-migratory animals, multi-year presence of ships and ROV/AUVs (and noise), discharge of sediment plumes, oil spills, removal of fauna - it is not correct to focus on just flora -, restructuring of seafloor (for decades if not centuries), etc.	Comments and opinions noted. The table referenced seeks to compare commonly analyzed social risks for land-based mining and compare these to NORI-D. More specific and detailed analysis is also provided in Table 3 (Comparison of Ambatovy and the NORI-D Project using selective criteria) and in Annex 6 (Indicators commonly used in social impacts assessment for the mining sector). The EIA is expected to address environmental concerns noted in the comment, including those which are unique to deep-sea mining activities. The SIA study will seek to include a comparison with other offshore developments.	TOR to note that SIA should add 1-2 other comparison tables, using off-shore developments.
15	III D Table 2	van der Grient Jesse	DOSI	Again, for completeness's sake, that ought to be considered. Last, there is no consideration here for land-based activities involved in the NORI-D operation. For example, where are the ships going to be built, where are the port and processing facilities? As long as this is not identified you cannot reliably claim that NORI-D ticks 'no' in any of those boxes.	The referenced Table 2 identifies key social risk differentiators between land-based mining and NORI-D. Considering the mining aspects, there will be no multi-year construction of a mine, mine camp, transmission lines, etc., no co-location with locally affected communities (including no indigenous communities), and no risks of child labour at NORI's DSM operation in the CCZ, which is located hundreds to thousands of kilometers from its nearest communities.	TOR to include heading regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.
16	III D	van der Grient, Jesse	DOSI	Nothing can be interpreted from statements like 'NORI is exploring'. Nothing is guaranteed and thus cannot be evaluated. This information needs to be available first before impact assessments can have any value.	The SIA scoping document (which is not an impact assessment study) contains sentences containing "exploring" to transparently indicate that no final decisions have been made. Once such decisions have been made, corporate polices and/or adherence to standards, such as IPC PS or GIIP, trigger due diligence and/or other types of assessments.	TOR to include heading regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.

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17	III D	van der Grient, Jesse	DOSI	It does seem like this example was chosen as it has issues in its operation. Why not compare it to mines in Australia or Canada? Why not compare it against a mine that would uphold the same kind of regulatory standards as NORI-D is aiming for? That would give a better comparison.	Opinion noted. The SIA scoping document provides multiple options to compare/contrast: "While Table 2 [Comparing key aspects of generic land-based mines with NORI-D], above, provides a more generic comparison, Table 3 compares selected attributes of the NORI-D Project with an operating mine and processing facility: the Ambatovy Nickel and Cobalt mine (Ambatovy) in Madagascar, as a comparative alternative source of target metals. Ambatovy was selected because it is a large-scale Nickel and Cobalt mining and processing operation, was financed by numerous multilateral banks, which apply the IFC Performance Standards (or equivalent), and provides data visibility (not because Ambatovy is the “best” or “worst” operation). Prizma notes that the lack of tailings storage facilities or numerous other infrastructure, and/or social ***risks*** related to the presence/co-location with communities, IPs etc. applies also to mining projects in Australia or Canada, even if many companies are appropriately ***managing*** their social risks. Prizma recalls a CEO stepping down after a mining company blew up an Aboriginal cultural site in Australia, dozens of advocay groups are calling for halt of the expansion plans of a major gold mining company in New Zealand and the USA, and that several First Nations in Canada expect to fight Ontario's government's proposed mining changes, and have signed a moratorium on new developments.	TOR to note that SIA should add 1-2 other comparison tables, using off-shore developments.

Page	Section	Author	Org.	Comment	Response	Action
26	III E	Jackson, Julian	Pew	Along these lines, it is worth noting that one could reasonably argue that opening up this new industry both disincentives addressing problems with land-based mining practices (so rather then offset actually perpetuates the problem) and puts less pressure on the need for innovative battery technology and recycling techniques to reduce the demand of these critical minerals. This counter argument should be included as a no-action alternative and should acknowledge a lot of the innovation in this space that is lowering metal demand predictions (e.g. within just the last 6 months the forecasted amount of total lithium-ion batteries that will be available for recycling in North America by 2025 went up 65%).	Noted. Industry initiatives, advocacy pressure, and policy measures targeting further improvement of land-based mining or battery technology can be reasonably expected to continue independently of the NORI-D Project. Numerous authoritative studies and publications cited in the SIA scoping document, and numerous national strategies, which also considered improved recycling and technological advancement, still point to long-term critical mineral shortages, need for geopolitical diversification, etc. For nickel, for example, the IEA estimates that 41 to 60 additional (land-based) mines will be required by 2030 (this estimate did not consider supply from DSM).	TOR to include topic project justification and demand forecast for battery metals
26	III E	van der Grient Jesse	DOSI	Even if deep-sea PMN nodules are collected, it is likely that land-based operations will continue, may expand or even create new operations. This is because NORI-D or TMC are not working with any terrestrial mining operation, and thus this operation will not offset land-based operations. Therefore, the idea that the start of deep-sea mining is reducing land-based impacts, in all its forms, is incorrect. Indirectly, the new competition this industry gives to terrestrial based operations could result in increased land-based pressures, and worsening of labor rights.	Opinion noted. The scoping document does not suggest that NORI-D offsets or eliminates land-based mining, in all forms, but seeks to compare the social risks of the two routes at arriving at the same metals.	TOR to include heading/topic regulatory context/corporate policies, and describe social due diligence/assessment approach for land-based facilities.

Page	Section	Author	Org.	Comment	Response	Action
29	IV A	van der Grient Jesse	DOSI	A section dedicated to land mining is not pertinent in this document, which should be limited to its purpose (a scoping report for a particular deep sea mining activity). There is no reason to assume that the proposed activity (extracting polymetallic nodules from the NORI contract area at the CCZ) will have any effect in any other mining activities. Therefore, this section is out of scope and must be eliminated.	Considering the term "mining" adopted by the ISA (and others), DSM's substitutes for the same battery metals being land-based mining operations, the concerns about potential economic impacts being felt by developing land-based mining producers, the SIA team believes that this comparison provides a useful context and benchmark.	TOR to note that SIA should add additional 1-2 comparison tables, using off-shore developments.
30	IV C	van der Grient Jesse	DOSI	Building a processing plant will bring certain land-based impacts – however the impacts do not or seem to be very minimally described in the report?	Noted. The ISA remains focused on the Project's activities in the Area Beyond National Jurisdiction. Prizma notes that, in March 2023, TMC entered into MOU with the Pacific Metals Co Ltd (PAMCO) of Japan, to evaluate the processing of nodules at the Hachinohe smelting facility in northern Japan into battery metal feedstocks. - The SIA will seek to provide high level summary of social due diligence and/or assessment for future land-based facilities. In addition to in-country E&S requirements for an OECD country such as Japan, the IFC PS and others provides relevant E&S and EHS guidelines for various land-based facilities (sectors) which can be considered.	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.
30-31	IV C	Jackson, Jesse	Pew	This section outlines potential processing options that are currently being explored in India. The SIA should give more detail on these options and their social and environmental impacts, as the options develop. In order to fully understand the social impacts of NORI-D it will be necessary to know which country nodules are being shipped to and what will happen to them once they are there. Perhaps the SIA could assess different options and examine those different alternatives.	The SIA scoping document transparently indicates that selections for land-based facilities - such as Rotary Kiln-Electric Furnace - have not been finalized, and are also not a central concern of the ISA, which is focused on the activities in the Area Beyond National Jurisdiction.	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.

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31	IV C	van der Grient, Jesse	DOSI	'as will be detailed in TMC and/or NORI's policies and commitments' – a promise that cannot be checked or verified for guarantees.	The SIA will list relevant TMC/NORI is policies and commitments.	TOR to include headings/topics regulatory context, corporate policies, and list these in the SIA.
34	V B	van der Grient Jesse	DOSI	'With project' also does not equal elimination of social (and other types of) risks, and can be expected to be shifted to other projects/operations elsewhere. This statement seems not to consider the scenario that competition of deep-sea mining can result in new and additional mining projects on land to offset loss of income as a result of the new competition.	Opinion noted. Prizma notes that with or without NORI-D, mining companies already operate in a competitive market environment. Without considering any potential contributions from DSM, the IEA estimates that, for nickel, 41 to 60 additional mines will be required by 2030 to meet projected demand. The demand for metals can be expected to drive new/additional mines (not the emergence of NORI-D).	TOR to include section on alternatives (to include also qualitative review of "with project")
34	VC	van der Grient, Jesse	DOSI	Counterfactual is a strange choice of words here – it means: relating to or expressing what has not happened or is not the case? What kind of scenario is that?	Opinion noted. Counterfactual analysis is used in economics, impact assessment, evaluation and other fields. Prizma applied it in a qualitative way to consider what may be expected to happen with NORI-D and what may happen in the absence of the Project. A simple counterfactual case can be developed by (a) using IEA's estimates that, for nickel, 41 to 60 additional mines will be required by 2030 to meet projected demand, (b) that Indonesia, the Philippines and Russia are the dominant nickel producers, and (c) the "business as usual" predictions by the Intergovernmental Panel and Climate Change (IPCC) about oceans (https://www.ipcc.ch/srocc/) notes that global mean sea level (GMSL) is rising and accelerating, carbon emissions from human activities are causing ocean warming, acidification and oxygen loss, the warming ocean is impacting biogeography of organisms with implications for food production and human communities.	TOR to include section on alternatives (to include also brief counterfactual analysis)

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35	V C Table 5	van der Grient Jesse	DOSI	'counterfactual scenario' again, this statement is not correct as it can still happen if NORI-D went ahead. The inclusion of this seems to scaremonger. There are many mines that are not using child labor. The presentation as it seems to suggest that this does occur everywhere which is false. Shortages may also increase prices for metals, what are the impacts of that?	Prizma considered and cited reputable publications, including those of the IEA, which note that DR Congo dominates the global cobalt production (>80%), children have been found to be present at about 30% of cobalt artisanal small scale mining (ASM) sites in the DR Congo, and notes also that over 60% of global cobalt processing occurs in China. Prizma accepts that child labor is not present everywhere, and believes that, due to their location and characteristics of NORI-D's nodules in the CCZ, there are no child labour risks similar to those of cobalt from the DR Congo and its related supply chain.	TOR to include section on alternatives (to include also brief counterfactual analysis)
35	V C Table 5	van der Grient Jesse	DOSI	No considerations of the onshore-based part of the mining process considered with the negative effects here. Instead, the focus is solely on the positives. That is not a fair comparison.	The SIA scoping documents notes, in several places, that future construction of nodule processing facilities will be subject to their host country regulatory and permitting requirements (and not the ISA), and would also be expected to be subject to commonly applied social due diligence practices, and/or designed to meet Good International Industry Practice (for example, the IFC Performance Standards and Equator Principles).	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.
38	V D	Jackson, Jesse	Pew	No Tailings Dams" for page 26 - NORI should define tailings, note what waste products will be dumped at sea, and what will happen to waste products on land.	Given the characteristics of nodules, the ISA does not refer to "tailings" in the context of DSM. Instead, the ISA's terminology refers to "sediment", "discharge", or "sediment plumes". The SIA will also adopt these terms. The SIA or EIA will quantify waste products and their destination. TMC's 2021 Impact Report summarizes the near-zero solid waste processing flow sheet for collected nodules on page 87 and can be accessed here: https://metals.co/tmcs-inaugural-impact-report/	Although the topic of waste is expected to be covered in the EIA studies, the TOR for the SIA to contain heading/topic of glossary (to define "tailings" and why it does not apply) and waste, to ensure key waste streams are identified.

Page	Section	Author	Org.	Comment	Response	Action
50	V J	van der Grient Jesse	DOSI	PS 5 – it is not a given or proven by NORI that the onshore processing of nodules will not result in land acquisition and involuntary resettlement. NORI claims both that they will use existing facilities as well as build their own, depending on where you look on their website and in this report. As this has not been determined yet, this report cannot exclude this PS 5 as there is no guarantee that it will not cause this. Further, existing facilities that NORI may use may have already caused this – would NORI consider this? Would NORI be implicit in the land acquisition their work will maintain that status quo or will it conveniently not be NORI's problem as it was down before them working there?	Prizma notes that, in March 2023, TMC entered into an MOU with the Pacific Metals Co Ltd (PAMCO) of Japan, to evaluate the processing of nodules at the Hachinohe smelting facility in northern Japan into battery metal feedstocks. - The SIA will seek to provide high level summary of social due diligence and/or assessment for future land-based facilities. In addition to in-country E&S requirements for an OECD country such as Japan, the IFC PS and others provides relevant E&S and EHS guidelines for various land-based facilities (sectors) which can be considered. The SIA scoping document notes that the applicability of PS 5 (Land acquisition and involuntary resettlement) will need to be revisited once further data is available, including [...] siting decisions relating to onshore facilities have been made. In general, historical resettlement impacts at a brownfield facility operated by a third party would not be attributable to NORI. However, due diligence review of such human rights risks would be advisable and in line with GIIP.	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.

Page	Section	Author	Org.	Comment	Response	Action
50	VI J -IFC PS	Jackson, Julian	Pew	PS 5 - Understandable that land acquisition and involuntary resettlement will not play a role at sea, however this section also claims that *"potential environmental effects of NORI-D in the CCZ will not likely generate significant adverse livelihood effects"*. Can NORI-D provide more evidence for this claim - in particular for effects to fisheries?	The comment relating to fisheries ("not likely generate significant adverse livelihood effects" - which might generate economic displacement) was considering distance to subsistence fishing communities (coastal communities) and potential for significant impacts on commercial fishing in the NORI-D area. Preliminary data discussed with NORI did not suggest significant impacts. This SIA section on PS5 on page 50 also notes "However, the applicability of PS 5 will need to be revisited once further data is available, including data relating to effects from, for example, sediment plumes, and siting decisions relating to onshore facilities have been made."	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.
63	IX	van der Grient, Jesse	DOSI	As this concerns mining in the deep sea, it seems odd to me that the tests regarding social changes, processes and other impacts are all based on land-based mining. That is comparing apples with oranges, we are dealing with a completely different industry here.	Noted. - Prizma continues to believe that it is a reasonable approach to compare DSM to its direct substitute: land-based mining. The social change processes identified in the SIA scoping document can also be applied to and analyzed for other types of activities, such as offshore wind or oil & gas development. Even here, it would be reasonable to expect similar preliminary conclusions presented in the SIA scoping document: the social risks and impacts of NORI-D's offshore DSM, many hundreds to thousands of kilometers form the nearest communities, can be expected to be comparatively low. Further analysis and/or risk management would still be required once land-based facilities are identified. Also, presence or lack of significant adverse impacts on fisheries and other forms of livelihoods, etc. need to be confirmed. Prizma notes the broader environmental concerns which have been raised in numerous comments which are directed to and would need to be addressed in the EIA.	TOR to note that SIA should add additional 1-2 comparison tables, using off-shore developments.

Page	Section	Author	Org.	Comment	Response	Action
65	IX D	Jackson, Jesse	Pew	Although processing facilities will be subject to host country regulatory and permitting requirements and not the ISA, some understanding of onshore effects would be useful for a full understanding of the project.	The SIA scoping document briefly notes that, for Project Zero, NORI intends to toll-treat nodules at existing Rotary Kiln-Electric Furnace (RKEF) facilities. Simultaneously, NORI is examining a business collaboration with Epsilon Carbon Pvt., LTD. to complete a pre-feasibility study for a commercial nodule processing plant powered by renewable energy to process 1.3 Mpta of wet nodules in India. In March 2023, TMC entered into MOU with the Pacific Metals Co Ltd (PAMCO) of Japan, to evaluate the processing of nodules at the Hachinohe smelting facility in northern Japan into battery metal feedstocks. For Project One, the collected nodules are expected to be processed, either at a new facility or pursuant to a toll-treatment model.	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.
65	IX F	Jackson, Jesse	Pew	Please note our comments above under “VI - D - Land-based Producer States” “page 44”.	Noted. The SIA scoping document's Section IX. Impacts to be Described or Studied in SIA/F. Impacts on Developing Land-based Producers highlights Lapteva's report (since edited), already refers to the need to consider potential impacts from DSM on Developing Land-based Producers in the SIA, and identifies those countries in Table 8: Land-Based Producer States potentially impacted by PMN production in the Area. The countries identified comprise Zambia, DR Congo, Eritrea, Chile, Laos, Mongolia, Peru, Madagascar, Zimbabwe, Gabon, Mauritania, Namibia, and Papua New Guinea. Of these, Eritrea and Peru are not ISA members.	TOR to include heading/topic social-economic impacts, under which topic Land- based Producer States will be covered, mainly by incorporating summary of updated Lapteva 2022 study.

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69	IX	Helen Russell		The other area which should be included within the guidance document (not necessarily relevant for this project) is on landmine and UXO clearance, in case relevant where the Project is located.	At this time, the expected use of brownfield facilities suggests that presence of UXO and related risks is very low, a topic which can be revisited once further site decisions have been made.	TOR to include regulatory context, standards and guidelines (showing general approach for undefined infrastructure)
94	Annex 8	Jackson, Juli	Pew	Several categories note that "Siting of onshore/processing facilities unknown, future analysis required at a later date". It will be hard to assess the social/economic impacts if analyses are not carried out until after the SIA.	Noted. The SIA will seek to provide additional details. SIA to provide high level summary of social due diligence and/or assessment for future land-based facilities. The IFC provides relevant E&S and EHS guidelines for various land-based facilities (sectors) which can be considered.	TOR to include heading/topic regulatory context/corporate polices, and describe social due diligence/assessment approach for land-based facilities.
	Webinar	Anon.	Anon.	Could you elaborate on the claim that there will be no tailings from nodule mining? It is hard to imagine how metals could be extracted from nodules without any by-products being produced. Is there a study available to justify this statement? It is not clear in the scoping document.	Given the characteristics of nodules, the ISA does not refer to "tailings" in the context of DSM. Instead, the ISA's terminology refers to "sediment", "discharge", or "sediment plumes". The SIA will also adopt these terms. The SIA or EIA will quantify waste products and their destination. TMC's 2021 Impact Report summarizes the near-zero solid waste processing flow sheet for collected nodules on page 87 and can be accessed here: https://metals.co/tmcs-inaugural-impact-report/. Additional information about the processing and products will be included in the SIA.	Although the topic of waste is expected to be covered in the EIA studies, the TOR for the SIA to contain heading/topic of glossary (to define "tailings" and why it does not apply) and waste, to ensure key waste streams are identified.

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	Webinar	Anon.	Anon.	Is there a reason that you are using a DSM vs Terrestrial Mining lens? How do you see this as appropriate? Isn't it like comparing apples to oranges?	We note that the IFC Performance Standards and the social impact topics presented in the SIA scoping document provide commonly used approaches and tools which are not "land-based standards" and are also routinely applied to analyze marine-based projects, such as off-shore oil or off-shore wind power developments.	TOR to include headings/topics regulatory context (describing IFC PS also for marine-based projects) and provide 1-2 comparison tables similar to Table 2 in SIA scoping document, involving marine-based developments).

Page	Section	Author	Org.	Comment	Response	Action
		Jackson, Julian	Pew	The ISA is entrusted by treaty to develop the rules and regulations to govern deep sea mining. If the Project goes ahead before ISA member States have been able to adopt the regulatory regime, it would severely damage the legitimacy of the ISA as an institution and regulator of the industry.	Noted. -This opinion seem to be directed at the ISA and its members, which would need to finalize ISA's regulatory regime and approve the Project's application to move to exploitation. One of the objectives of the SIA is to inform the ISA and its members about social risks and impacts. NORI advised the SIA team that the ISA is expecting to finalize its regulatory regime in 2023.	SIA to characterize the status of applicable ISA's regulatory regime. Topic heading to be included in TOR: Regulatory Context.
		Dobush, Bobbi	OF	NORI's parent company, TMC, has misled investors about the likelihood of success of their operations. For example, recent TMC statements regarding ISA negotiations grossly downplay the controversy ongoing at the ISA. On November 16, 2022, CEO Gerard Barron stated that TMC was not worried about calls for a moratorium or ban on DSM because, UNCLOS "mandates the [ISA] and its Council to put in place exploration and exploitation regulations..."4 There are many legal bases for a moratorium, as discussed at ISA 27-III.	Referred to NORI/TMC. While SIA not expected to provide legal opinions, any updates by the ISA about the status of its regulatory regimes or delays (including any moratoria) will be provided	TOR to include topic regulatory context (provide update about status of ISA" regulatory regime in context of NORI's plans to submit an exploitation application)
	General	Zandvliet, Luc	TRA	Reading the report as a neutral reader, a concern I would have is the unfinished and wobbly ISA benefit sharing approach as well as the significant payment of onshore tax to the host nation of the processing plant. With the stakes this high ($9.2 billion is no joke!) and Nori's ability to process nodules anywhere, the risk of royalty payments, ISA Management of the Economic Assistance Fund the risk of benefit distribution becoming a socio- political mess is considerable. I would see competition between countries over hosting a processing plant, as well as ISA's ability to distribute financial benefit as potentially fraught given that the mechanism has yet to be finalized. Other than risks of corruption and 'horse trading' between countries I could also see countries offering very attractive conditions to Nori, possibly at the expense of worker rights in processing plants.	The SIA will track and update ISA benefit sharing and distribution as they are published. Relevant ESG topics related to future, land-based infrastructure (which are not under ISA's purview) is expected to be subject to future due diligence and/or assessments, also expected to be aligned with the IFC PS, EP and Good International Industry Practices (GIIP), such as OECD due diligence guidelines.	SIA to review and characterize ISA benefit sharing approach, incorporate TMC/NORI's corporate policies and commitments. - Add relevant headings/topics to TOR: regulatory context, proponent, benefit sharing
	General	Zandvliet, Luc	TRA	And, Nori's could ultimately be linked to these impacts from a human rights perspective (corruption is increasingly viewed in human rights terms). In other words, I would include a risk assessment (to people as well as to the company) in the SIA and describe mitigation measures where appropriate.	TMC/NORI's governance, ethical conduct and human rights policies will form part of a ESMS, and is expected to be identified/listed in the SIA	SIA to identify NORI's ESG policies and corporate governance. TOR to include heading under regulatory context, description of proponent, and/or human rights section.

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2	About this Document	Jackson, Julian	Pew	The project's planned SIA is described as being structured around the sections outlined in the "*ISA's Template Table of Contents for an EIS*". To clarify, is the intent that the information gained from the SIA be incorporated into Sections 6 and 9 concerning 'Description of the existing socioeconomic environment' and 'Assessment of impacts on the socioeconomic environment and proposed Mitigation', respectively? If so, NORI may want to consider additional guidance for conducting an SIA, especially as this assessment could set precedent for conducting SIAs in ABNJ. NORI should draw on resources prepared for other/similar industries and note where differences exist given the DSM context. In addition, it is worth noting that during the most recent ISA meeting several delegations agreed (without any objections from other member States) with the addition of a standalone section (9bis) to describe and evaluate any uncertainties for assessments included in the EIS (environmental, socioeconomic and cultural). The scoping report does not seem to emphasize the need to highlight uncertainties (it is only mentioned one time in the report), so we recommend this be more greatly emphasized in the ToR. (emphasis added)	The SIA team considered E/SIAs from offshore oil and gas developments, and offshore wind farms. The scoping document highlighted, for example, indicators commonly used in social impacts assessment (see Annex 6), and refers to guidelines by the International Association for Impact Assessment (IAIA). The SIA (and ESIA) includes and builds on the ISA template, and includes also GIIP, as defined, for example, by the IFC PS and EPs. TOR and SIA will also consider topics introduced through engagement and consultation processes.	TOR to include headings/topics of uncertainty and stakeholder engagement, which may continue to add new topics/issues to be considered during the SIA phase.
9	III C.1	van der Grient, Jesse	DOSI	The wording is somewhat misleading here – in the original expedition planning TMC/NORI would have commenced with test mining before the approval, but because of winch failure the expedition was delayed, thereby obtaining approval first. Only successes are described here – why not what went wrong and lessons learned? For example, the discharge was less than planned, therefore the discharge plume was smaller than projected. How will this affect the outcome? These aspects also need to be considered.	Unclear to Prizma what this opinion is based on. The SIA scoping document notes the following: "Following ISA recommendation to commence testing, NORI and offshore partner Allseas commenced the Collector Test in September 2022. Following initial pilot system commissioning tests, a dedicated team of 130 crew and engineers aboard the Hidden Gem conducted a series of production runs in the NORI-D test area. [...]" In terms of data collection and modelling of sediment plumes, Prizma is also unclear what the opinion is based on. NORI advises that DHI, the expert advisors engaged for this task, has been able to collect the data need for its assignment. The input and results of DHI's wok is expected to be published as part of the EIA, and will be open to scrutiny. The SIA will include/provide additional information.	TOT to include Pilot Collector Test (confirm timing of permit and start pilot collector test in the CCZ)

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21	III E	Jackson, Julian	Pew	Money paid to ISA - Contractor should provide more explanation to justify their assumptions regarding the IRR and expected corporate tax rates. The current projections for cumulative royalties are, as indicated in the document, are not yet finalized.	SIA study to continue to refer to and utilize filed technical studies and related updates on taxes etc., including those published by the ISA. Assumptions and projections of IRR are published in the Technical Report on the SEC website: https://www.sec.gov/Archives/edgar/data/1798562/000121390021033645/fs42021a2ex96-1_sustainable.htm	TOR to include heading/topic of socio-economic issues, which will also cover information on applicable taxation regime, as defined by, for example, the ISA and Nauru.
21	III E	van der Grient Jesse	DOSI	For completeness's sake, there ought to be a statement that the royalties estimates are preliminary and by no means a guarantee. Where is the consideration of risks to the proposed endeavor? The payment regime of the ISA is not complete or established and until this is clearer, it is not clear how much money is left for TMC and what that means for the viability of the project.	Noted. AMC's Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clipperton Zone speaks to the rate of return and net present value from the NORI property. TMC also files (publishes) its annual (financial) reports. It is common for such studies to include assumptions and estimates.	TOR to include heading/topic of socio-economic issues, which will also cover information on applicable taxation regime, as defined by, for example, the ISA and Nauru.
21	III E	van der Grient Jesse	DOSI	Table 4: this is perhaps disingenuous. As stated in the policy brief, the formula is a possible example for the distribution of revenue. As stated earlier, there is currently no payment regime established and possibly the ISA is not even close to establishing one any time soon – there continues to be much debate about this. This table seems to me to misrepresent the situation and possibly hint at false assumptions/outcomes.	The SIA will track and update ISA benefit sharing and payment processes as they are published	TOR to include heading/topic of socio-economic issues, which will also cover information on applicable taxation regime, as defined by, for example, the ISA and Nauru.
22	III E	Jackson, Julian	Pew	This section notes that NORI is not currently subject to corporate income tax in Nauru, and that both parties are working to "resolve this issue". This is interesting because it is difficult then to understand the economic benefits to the government from the Project. It must also be noted that the studies undertaken by MIT, which underpin the negotiations on the payment regime at the ISA, are premised on the assumption that contractors pay a 20% corporate tax rate. NORI must be transparent in the negotiations on the ISA payment regime discussions to divulge that it does not pay CIT in Nauru to help build a more accurate and informed model of the financial mechanism.	Comment noted. The SIA will be able to provide updated details on benefit sharing, such as the status of taxation.	TOR to include heading/topic of socio-economic issues, which will also cover information on applicable taxation regime, as defined by, for example, the ISA and Nauru.

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28	III E	Jackson, Julian	Pew	The scoping document notes that NORI will "continue to contribute to the growing understanding of the deep-sea". Although data has been collected during the contractor's exploration phase, it is hard to say how mining in the exploitation phase will contribute to our understanding of the deep sea. It is also arguable that scientists coming from a more academic angle would have studied the deep sea in a different manner, with different goals. The scope, motivations, mechanisms, and timescales of research done in an exploration context are likely to be quite different. Further, the scoping document notes that "*Results of these scientific studies are provided to the ISA*". Are the results publicly available? How accessible are these results? We cannot not find any of NORIs data on DeepData, nor any of the other subsidiaries of The Metals Company. NORI may want to verify its data is indeed publicly available through DeepData and if not, ensure through the ISA that it becomes publicly accessible.	Comments and opinions noted, recommendation passed on to NORI. - In terms of the SIA, the SIA scoping document was published and its availability was announced through a variety of social media platforms (some reaching well over 20,000 page views). The SIA scoping document provides links to TMC/NORI's website hosting the Collector Test EIS (Executive Summary available here: https://metals.co/wp-content/uploads/dlm_uploads/2022/12/NORI-D-Collector-Test-EIS-Final-Executive-Summary-and-Table-of-Contents.pdf). The full EIS document, including appendices, stakeholders' comments and responses provided, are also web posted and can be accessed here: https://www.metals.co/nori (scroll down to relevant sections).	TOR to include heading or topic regulatory context, disclosure or similar (note if data is posted on DeepSea or other parts of ISA's website, in addition to TMC/NORI's website)
40	VI A	van der Grient Jesse	DOSI	It was not the presence of deep-sea minerals that drove the establishment of UNCLOS, but a concern that any benefits from resource exploitation would be concentrated with advanced economies and not benefit all of humankind.	The scoping doc states that DSM was "one" of the major drivers in establishing UNCLOS, fair benefit distribution is also a driver.	TOR to include regulatory context (provide high-level summary of UNCLOS' genesis)
41	VI	Jackson, Julian	Pew	Appreciate the inclusion of the box on the "Common Heritage of Mankind"	Noted.	TOR to include regulatory context (include CHH box/information)
42	VI B	van der Grient Jesse	DOSI	Clarify the procedures or thresholds for Assembly approval of rules, regulations, and procedures after Council adoption.	The rules of the ISA are publicly available; refer to ISA's website and annual reports for summary of its processes: https://isa.org.jm/secretary-general-annual-report-2022/	The SIA will identify and insert a summary and/or link provided by ISA. - TOR to include heading regulatory context and provide high-level summary in the SIA.
43	VI - C	Jackson, Julian	Pew	In providing an overview of positions of the PSIDS, also include the countries within the region that have called for a moratorium on deep sea mining. These include Palau, Fiji, Federated States of Micronesia and Samoa.	Noted. SIA to provided updated table, identifying PSIDS which have called for a moratorium.	TOR to include headings such as regulatory context and ISA/Members, and stakeholders, which will contain the official PSIDS statements/positions on DSM.
43	VI B	van der Grient Jesse	DOSI	Describe procedures for the selection of LTC members, describe process and criteria for the review of application and opportunities for public comment and scientific review.	The rules of the ISA are publicly available; refer to ISA's website and annual reports for summary of its processes: https://isa.org.jm/secretary-general-annual-report-2022/	The SIA will identify and insert a summary and/or link provided by ISA. - TOR to include heading regulatory context and provide high-level summary in the SIA.

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44	VI D	Jackson, Julian	Pew	The scoping document quotes the advanced unedited version of the Lapteva et al study (2020). There is now an official 2022 version VI - D - Land- based Producer States (https://www.isa.org.jm/node/21773). The scoping document seems to imply that because the majority of the listed Potentially Vulnerable Land-Based Producer states are ISA members and "*involved in its governance*", no further analysis is needed. However, of the 13 identified developing countries whose economies may be seriously affected by nodule mining, a majority are not engaged or in attendance at the ISA Council or Assembly deliberations. The purpose of the SIA should be to help stakeholders, including these Member States, understand the impacts of NORI-D. This section should offer more detail on how land-based producer states will be affected.	Noted. The SIA scoping document's Section IX. Impacts to be Described or Studied already refers to the need to consider potential impacts from DSM on Developing Land-based Producers in the SIA, and identifies those countries in Table 8: Zambia, DR Congo, Eritrea, Chile, Laos, Mongolia, Peru, Madagascar, Zimbabwe, Gabon, Mauritania, Namibia, and Papua New Guinea. Of these, Eritrea and Peru are not ISA members. The SIA will not seek to expand, duplicate or repeat Lapteva's study. The ISA is already mandated to assist such states, should they be affected by DSM.	TOR to include heading/topic social-economic impacts, under which topic of Land- based Producer States will be covered, mainly by incorporating summary of updated Lapteva 2022 study.
44	VI D	Jackson, Julian	Pew	The scoping document notes that the Lapteva et al study "*concluded that, for all demand growth scenarios considered for copper, nickel, and cobalt, the production by even 12 contractors would not exceed the expected demand growth*". However, the study (2020 and 2022 versions) says "*Offshore mining, under any scenario, will have a significant impact on the markets of affected metals, changing the direction and volume of supply of these metals"*. As the study itself notes, modeling the effects of seabed mining to metal markets depends on many assumptions. For copper: "*Under other consumption growth scenarios, a copper shortage may manifest itself either after 2032 or not at all, as all the world economy's copper needs may be met by land-based production and secondary metal*." For nickel: "*Only if nickel consumption growth rates are higher than the low scenario of consumption growth, the beginning of offshore mining will not cause overproduction of the metal"* For cobalt: "*However, significant overproduction of cobalt can be expected up to 2028 and is difficult to avoid. As a result, such large stocks of cobalt may accumulate in various warehouses that insufficient production would be compensated for by these stocks for a long time to come"* The SIA should look at the nuances of this study and whatever other materials may be available, to determine effects to land-producer states.	Noted. The SIA scoping document's Section IX. Impacts to be Described or Studied already refers to the need to consider potential impacts from DSM on Developing Land-based Producers in the SIA, and identifies those countries in Table 8: Zambia, DR Congo, Eritrea, Chile, Laos, Mongolia, Peru, Madagascar, Zimbabwe, Gabon, Mauritania, Namibia, and Papua New Guinea. Of these, Eritrea and Peru are not ISA members. The SIA will not seek to expand, duplicate or repeat Lapteva's study. The ISA is already mandated to assist such states, should they be affected by DSM.	TOR to include headings/topic socio-economic impacts. This and/or other related section will cover (but not duplicate/expand) the Lapteva 2022 study, and use also commodity/market forecast studies completed on behalf of TMC/Nauru, or other authoritative agencies or institutions (such as IEA, World Bank, Nickel Institute etc.).
46	VI F	Jackson, Julian	Pew	The LTC's 2021 "Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone" (ISBA/26/C/43) includes many pending steps that will need to be accomplished prior to assessing an application for exploitation. The ISA will need to review the CCZ EMP again before accepting exploitation applications.	Noted. Comment appears to be mainly directed at the ISA.	TOR to include topic or heading regularly context (and note status of emerging regime related to NORI's planned exploitation application)

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46	VI E	van der Grient Jesse	DOSI	In addition to the inclusion of SIDS representatives on the LTC, describe other areas of necessary scientific expertise and a transparency process for selection of these members.	The rules of the ISA are publicly available; refer to ISA's website and annual reports for summary of its processes: https://isa.org.jm/secretary-general-annual-report-2022/	TOR to include regulatory context and ISA (and provide links to additional details requested in comments available on ISA's website)
46	VI G	van der Grient Jesse	DOSI	Describe processes for evaluation to ensure that sponsoring member states maintain “effective supervision and regulatory control over” sponsored contractors.	The SIA to describe the role of the regulators, including ISA and Nauru	TOR to include heading/topic on regulatory context, sponsor, and ISA which can cover such topics.
49	IV	Helen Russell	S4ASP	Page 49/ Section VI. Regulatory Context: Recommend that there is specific reference to the International Maritime Organization (IMO) standards here, as well as the need to co-ordinate with national authorities and national agencies tasked with marine protection, as well as IPIECA/OGP (who have some great tools such as the RETOS - Readiness Evaluation Tools for Oil Spills)	ISA requirements for an exploitation application include an Emergency Response Plan (ERP), as well as a health & safety plan. See also ISA's requirements shown here: https://www.isa.org.jm/wp-content/uploads/2022/12/ISBA_27_C_3-2117326E.pdf. SIA will further identify relevant IMO standards and guidelines (also identified by the ISA). The ESIA expected to include high level overview of ERP, which would also be expected to cover fuel spills. SIA team to further review IMO/IPIECA/OGP and include in SIA, as appropriate.	TOR to include headings such as regulatory context, applicable standards and emergency response planning.
62	IX A	Jackson, Julian	Pew	This section refers to the ISA’s draft regulations and topics that should be covered in the EIS. We recommend NORI survey the literature on SIAs to see if any further topics or steps should be included as best practice.	The purpose of the SIA scoping document and past and future engagement efforts is to identify relevant topics for NORI-D's SIA study, which include but are not limited to the ISA requirements. Literature reviewed (including published examples of E/SIAs) identified key topics which were screened for relevance to the NORI-D Project. Examples highlighted in the scoping document include Annex 6: Indicators commonly used in social impacts assessment for the mining sector. Also, the IPC PSs provide guidance of the key topics which should be considered. Other E/SIA from off-shore wind farming or off-shore oil and gas project were also considered by Prizma's team. These can be defied further in the SIA study. NORI-D's SIA would be the first such SIA study in the CCZ.	TOR to include headings/topic on regulatory context, applicable standards and guidelines, and literature reviewed, identifying relevant GIIP on SIA.
78	Annex 3	Helen Russell	S4ASP	Page 78/Annex 3: Other Relevant Convention, Protocols and Codes, row The International Marine Minerals Society’s Code for Environmental Management of Marine Mining (2001). Balloon comment: Is it worth referring to the IMO's current list of new and emerging issues here? Marine litter for example	SIA to review the International Marine Minerals Society Code for applicability.	TOR to include headings/topics on regulatory context, applicable standards and guidelines.

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	Webinar	Anon.	Anon.	When and how will you integrate the SIA and overall ESIA? Is there schedule on that?	The ISA expects a 'combined EIS' submission. Many elements of the SIA will dependent on outputs from the EIA studies. The modalities of combining the EIA and SIA are still being developed. Structured meetings/discussions have been initiated.	TOR to include topic or heading schedule for SIA (or ESIA)
	Webinar	Anon.	Anon.	Does the seabed collection of nodules fall under the definition of mining or is mining just a convenient term to use as raw state metals are involved?	The ISA uses the term "mining", and stakeholders use a variety of terms, for example, "harvestings" and "collecting" of nodules. The many material differences between land-based and deep-sea mining are outlines in the SIA scoping document, and are evident in the comments received.	TOR to include a glossary
	Webinar	Anon.	Anon.	When are you going to release results?	Updated schedule of studies be conducted and their interdependencies are still being developed.	TOR to include topic or heading schedule for SIA (or ESIA)

Page	Section	Author	Org.	Comment	Response	Action
		Zandvliet, Luc	TRA	In particular, it is difficult to involve “the community” in a public consultation and disclosure plan. The report includes a number of Prisma’s opinions that are a consultant’s opinion (e.g. related to the applicability of IFC PS 7) and could be debated. The current review process allows for these opinions to be challenged. I like Prisma’s clarity re: which ideas are theirs so that the report can be read against this background	One of the purposes of the SIA scoping document is to encourage debate (including about the consultant's opinions). NORI recognizes any interested party to be a stakeholder, so not limited to physical proximity to the DSM site, or Prizma's preliminary screening related to IFC PS7. NORI has already conducted numerous engagements, including those described in the SIA Scoping document. Additional engagement has also been conducted related to this SIA scoping document, which will be summarized and published. Further outreach is planned on the sidelines of the next ISA meeting in March 2023, and during visits to the Pacific Islands of Nauru and Fiji in Q2/2023, to further explore, consider, and incorporate stakeholders' perspectives.	The TOR to include topics or headings valued social components, traditional knowledge, underwater cultural heritage, and stakeholder engagement.
	General	Jackson, Julian	Pew	It is encouraging to see that NORI defines its stakeholder base as “as any interested individual or organization” and that their “identified listing essentially comprises the entire human population around the world”. However there seems to be a disconnect later in the document where various stakeholders are expected to be primarily represented through their Member States at the ISA (see specific comments for pages 53-54, and page 63 below). The purpose of the SIA should be to engage with and elicit stakeholder responses directly. This SIA could be precedent setting as it is for the first project in the Area, beyond national jurisdiction, affecting the Common Heritage of Mankind. As the project is in the Common Heritage of Mankind, greater effort should be given to educate and elicit public response - including from indigenous peoples, youth, industry representatives including from fisheries and other marine users, and those listed in Table 10.	The different roles, responsibilities and growing expectations of Contractor, 'the emerging DSM Industry,' the ISA (and ISA Observers?) may explain the apparent disconnect noted in the comment related to engagement in different parts of the SIA scoping document. Prizma notes that, somewhat unusual for an extractive project development, where the IFC PS7 describe indigenous communities distinct from mainstream groups in national societies, often among the most marginalized and vulnerable segments of the population, and, in effect, without a proverbial 'seat at the table,' the ISA context for Pacific Small Developing Islands like Nauru, the NORI-D Project and the ISA governance model looks very different. All PSID - including Nauru - are voting ISA members who can represent their interest and participate in ISA's governance structure. And Nauru is a Sponsor of NORI and its NORI-D Project. Prizma notes that further outreach is planned, including during visits to the Pacific Islands of Nauru and Fiji, to further explore and incorporate stakeholders' perspectives, including from key groups identified in the SIA scoping document and the comment. The SIA stage will provide additional engagement opportunities, without being able to fully replace the roles other actors (stakeholders) will need to play.	The TOR to include topics or headings valued social components, traditional knowledge, and stakeholder engagement.

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	General Comments	Mironenko, Olga	EnvSci	The draft presents a rather unbalanced position, offering pro-deep-sea-mining facts and perspectives, but gravely omitting the analysis of multiple threats and risks of deep-sea mining. Alarmingly, most scientific allusions in this draft are either incorrect or – mostly - bluntly fake, as you will see from the comments on the annexes below. It pains me to see as a scientist that the science behind this draft does not even reflect the current scientific stance on deep-sea mining and therefore cannot be accepted as accurate and responsible.	Opinions noted. The *SIA* scoping document is designed to highlight NORI-D's *social* risk profile using numerous standards and indicators commonly used in preparing and conducting a social impact assessment. The document also notes that "biodiversity issues – as well as other environmental topics – will be included in the environmental impact assessments process." Most concerns about DSM (and most of those raised by the commentator) appear to be connected to ecological and biodiversity aspects, and related ESS, which are expected to be addressed in the EIA. This may have contributed to the impression of an "unbalanced position." The SIA is not a "pro" or "anti" document but seeks to identify and assess key social risks, taking into account diverse stakeholder perspectives.	TOR for SIA to reflect the need to show both positive and negative impacts
		van der Grient, Jesse	DOSI	Several statements are made based on preliminary data or are unsupported in general. This is not clearly identified or evaluated in the report. This lack of focus risks limiting the assessment and its scope.	The SIA scoping document is a preparatory document to help design the TOR to conduct the SIA in the next phase. This also means that preliminary data and analysis was used, as is common for such preparatory scoping studies, to enable early engagement, better planning, and a more focused SIA study. The preliminary nature of data and analysis is highlighted numerous times. For example, Table 5: Preliminary comparison of “With Project,” “No Project” and “Counterfactual” scenarios Category With Project No Project Counterfactual; or Prizma’s preliminary screening of the Project against the IFC Performance Standards on page 50ff, or providing a "preliminary analysis" of indicator examples contained in the IFC’s guidance note on cumulative impact assessment, along with a preliminary analysis to explore if/how they may be relevant to the Project presented in Annex 8. The scoping document includes approximately 106 citations and numerous references, including to ISA, IFC, etc., which also are embedded with extensive references and literature citations. [emphasis added]	TOR to include topics or heading baseline data and literature review (further improve data and references to used for the SIA)

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		van der Grient, Jesse	DOSI	There are a lot of statements presented in the scoping report that cannot be verified. There are also a lot of promises in here that cannot be guaranteed. That makes assessing this scoping report difficult. What is the value of this assessment, and what are the safeguards for presenting outcomes? It seems that the timing of this report is not in line with the timeline for when data are available, which has implications for this work. This includes the collector test results and EMMP results. It gives the impression that this work is rushed.	The SIA scoping document is a preparatory document to help engage stakeholder, and design the TOR to conduct the SIA (next phase). This also means that preliminary data and analysis was used, as is common for such preparatory scoping studies, to enable early engagement, better planning, and a more focused SIA study. The preliminary nature of data and analysis is highlighted numerous times, as detailed in the previous response. While it is not fully clear what "a lot of promises" refers too, Prizma notes that the SIA will identify and refer to relevant corporate policies and standards in terms of social due diligence and assessment which may be required for currently undefined land-based facilities. The results of the next SIA phase will also provide additional engagement and consultation opportunities.	TOR to include headings or topics regularly context (to include corporate polies, description of applicable standards), and future developments.
		van der Grient, Jesse	DOSI	There seems to be a lot of repetition of arguments in this report focused on only benefits of deep-sea mining. Where are the considerations for the negative impacts? These only seem presented when considering land-based mining projects, and especially ones that have a reputation for having negative impacts. Why are comparisons not made with terrestrial mines that are equivalent in rules and regulations as the proposed NORI-D? Why are the negative impacts of the proposed NORI-D not presented in a similar way as the negative terrestrial mines? Right now, this report risks coming off as cherry-picking facts to make the NORI-D project look exceptionally good.	Opinion noted. Publishing all comments/submission received for the SIA scoping document is designed to enable individuals and organizations, including DOSI, to continue to highlight their concerns directly. Highlighting and contrasting unique characteristics of NORI-D's DSM project are fact-based or use reasonable and stated assumptions, enabling a more informed discussion and/or divergent interpretation. The scoping document also includes negative social concerns, for example, on page 58, noting "Social concerns raised include lack of a “social license”, concerns about costs/impacts to Pacific Island communities, potential loss of ecosystem services (such as fisheries production), and inadequate stakeholder consultation." The TOR will confirm that the SIA will include characterization of both positive and negative effects.	TOR to include topic or heading scope to include both positive and negatively impacts.

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2	I	van der Grient, Jesse	DOSI	There is no outline for how feedback will be considered; no guidelines or criteria as of what is required for a comment to be considered or omitted or how it will inform future work. How will the comments be evaluated?	All comments received for the SIA scoping document will be listed, responded to, and published in a record of scoping document. The "Action" column will identify planned or new actions required, and be reflected in the TOR. The SIA study (next phase) will also continue to be open to adjustments in response to stakeholder comments and/or findings of the EIA and related studies, or directions from Nauru or the ISA. Overall, comments were solicited to help draft the TOR for the SIA study.	TOR to be drafted reflecting actions identified in responses provided to comments received.
3	I	van der Grient, Jesse	DOSI	It is not clear how TMC/NORI-D will ensure all necessary stakeholders are engaged, or how TMC/NORI-D would check this.	The SIA scoping process is designed to enable the identification of stakeholders and support engagement efforts. As noted in the scoping document, a Public Consultation and Disclosure Plan (PCDP) or Stakeholder Engagement Plan will be developed to assist in the process. Prizma and NORI will provide outreach and created inclusive participation opportunities, recognizing that participation has to be voluntary.	TOR to include a topic or heading public consultation and disclosure plan.
36	V C Table 5	van der Grient, Jesse	DOSI	'With project' – while this claim that scientists are free to publish is probably true, it does seem interesting that these scientists do not want to talk about operations on the ship or proceedings of the collaboration. So stating this freedom does seem a little disingenuous.	Opinion noted. The results of scientists' activities will probably best viewed through their reports and publications. Prizma's team presented its work during several webinars and presentations, including the publication of the SIA scoping document. Prizma plans to present at the next annual meeting of the International Association for Impact Assessment in Malaysia in May 2023.	TOR to include baseline data (highlight/list presentations and publications of scientists and contributors to the E/SIA)

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47	VI H	van der Grient, Jesse	DOSI	False claims to transparency or serious public stakeholder engagement: “Draft exploitation regulations have been prepared following a multi-year, transparent process, and involving public consultation.” Describe any processes or procedures for “taking into account stakeholder input.”	This comment seems to be directed at the ISA. In its draft Communications and Stakeholder Engagement Strategy (https://www.isa.org.jm/wp-content/uploads/2022/03/Draft_Comms_and_Stakeholder_Engagement_Strategy.pdf, Zero Draft) the ISA notes: "The Authority gives particular importance to collect inputs and feedback from all stakeholders when developing key documents. In the case of the development of the draft regulations for exploitation of mineral resources in the Area, six rounds of stakeholder consultations have been held since the inception of the process in 2014. Stakeholder consultations were also held on the development of the Strategic Plan and High-Level Action Plan of the Authority respectively in 2018 and 2019. Readers are directed to ISA's website: https://www.isa.org.jm/the-mining-code/; to studies and reports prepared by or for the Secretariat of the ISA to support the development of the Mining Code: https://www.isa.org.jm/the-mining-code/studies-reports-and-workshop-reports/;	TOR to include heading on ISA and status of regulatory regime
53-54	VII Key Stakeholders	Jackson, Julian	Pew	Appreciate that NORI “*defines its stakeholders as any interested individual or organization”* and that the “*identified listing essentially comprises the entire human population around the world”*. Given that the NORI-D project will affect the common heritage of mankind, this is an appropriate definition. One category of actors that is missing from Table 10 is other industries - for example fishing and shipping. It is possible that seabed mining could affect these industries and so their input should be included. Other marine users should also be identified.	Noted. SIA scoping document section IX. Impacts to be Described or Studied in SIA, lists headings such as Fishing, Tourism & Scientific Research as topics to be covered. Prizma and NORI plan visits to Nauru and Fiji in Q2/2023, to meet with diverse stakeholder groups, such as fishing and shipping (or their associations/representatives), and, if warranted by further baseline reviews and impact analysis, other stakeholders.	TOR to include topics or headings fishing and marine traffic, and stakeholder engagement.

Page	Section	Author	Org.	Comment	Response	Action
53-54	VII Key Stakeholders	Jackson, Julian	Pew	Another category missing from the list is youth - the next generation of business leaders and environmental activists should be actively consulted. We recommend that stakeholders be proactively involved and asked for input - it will not be enough to simply ask interested parties to check a website or be on a specific distribution list. As this project will affect the common heritage of mankind, and noting that the general public is still largely not aware of seabed mining, it could be useful to have a wider societal discussion on the industry.	Noted. The ISA, the Contractors (as a group), ISA State Members and others will continue to have an important role to play in raising broader awareness about DSM and CHH, while the SIA for NORI-D will remain more project focused. The numerous Observers at the ISA, including the Pew Charitable Trusts, will also continue to play an important role, including by continuing to support advocacy groups, such as the Ocean Foundation (over $1.5 million in 2021), which also submitted comments on the SIA scoping document. We note that the World Economic Forum published Decision-Making on Deep-Sea Mineral Stewardship: A Supply Chain Perspective (2022), and, on behalf of a broad international consortium (including TMC), GCE Ocean Technology, a Norwegian ocean technology cluster, is developing the first handbook for Environmental, Social and Governance (ESG) disclosure in relation to marine minerals.	TOR to include headings baseline studies to include engaging with youth groups and/or their representatives.
55	VI H Table	van der Grient, Jesse	DOSI	Youth voices are not considered in this table. Common heritage is for everyone, including those after us, and someone ought to speak for them too.	Noted. The SIA team will continue its outreach to reach such groups, such as the One Ocean Hub, which is an international research program that covers also the rights of youth/children on healthy oceans. Prizma and NORI also plan to engage with youth during planned visits to Nauru and Fiji in April and May 2023.	TOR to include headings baseline studies to include engaging with youth groups and/or their representatives.
55		Mironenko, Olga	EnvSci	Future generations are not on the list of the stakeholders, while they should be. The sea bottom belongs to them as well, according to UNCLOS	Noted. The SIA team will continue its outreach to reach such groups, such as the One Ocean Hub, which is an international research program that covers also the rights of youth/children on healthy oceans. Prizma and NORI also plan to engage with diverse stakeholders, including youth, during planned visits to Nauru and Fiji in April and May 2023.	TOR to include headings baseline studies to include engaging with youth groups and/or their representatives.

Page	Section	Author	Org.	Comment	Response	Action
56	VII A	van der Grient, Jesse	DOSI	Describe if stakeholder comments will be made public along with the summary of comments and NORI response.	Unless anonymity has been requested by stakeholders, their comments on SIA scoping document and/or future SIA study (such as summary or minutes of meetings) will be published. In response to comments received during a webinar, for events were no permission was not explicitly requested or granted by participants, the comments received will not be attributed and anonymized.	TOR to include heading or topic stakeholder engagement, and consultation and engagement record.
57	VII A	van der Grient, Jesse	DOSI	With regard to 7, will all public comments and responses be made publicly available to member states, observers and other stakeholders? Also, who are the other stakeholders? Is there a plan for outreach or education on the SIA Scoping and TOR?	The SIA scoping document was submitted to the ISA and no responses were received. The record of scoping, including all comments received, are expected to be submitted to the ISA. Prizma and NORI conducted two webinars on the SIA scoping document. The recording are web posted here: https://metals-co.zoom.us/rec/share/r9-x-9niz4gi283IBsQSYwVzvr332UvNUOWL3A2UUnrKwrX2fFiU2id7x1-PN4gb.xLDcrVpBgmDzHkP_ and here: https://metals-co.zoom.us/rec/share/r9-x-9niz4gi283IBsQSYwVzvr332UvNUOWL3A2UUnrKwrX2fFiU2id7x1-PN4gb.xLDcrVpBgmDzHkP_ and here: https://metals-co.zoom.us/rec/share/r9-x-9niz4gi283IBsQSYwVzvr332UvNUOWL3A2UUnrKwrX2fFiU2id7x1-PN4gb.xLDcrVpBgmDzHkP_. - Unless anonymity or confidentiality is requested by stakeholders, their comments on SIA scoping document or SIA study (such as summary or minutes of meetings) will be published, thus become also available to all interested parties and the ISA. The TOR will be publish along with the record of the SIA scoping. A summary of these are expected to be presented on the sidelines of ISA's next n March 2023 meeting in Kingston.	TOR to include heading or topic stakeholder engagement, and consultation and engagement record.

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57	VII B	van der Grient, Jesse	DOSI	Is there any third party involvement in the summary of stakeholders' key concerns and comments?	Prizma is an independent, third-party consultant and will be providing a summary of key stakeholder concerns. To the extend permitted by stakeholders, their comments will also be published.	TOR to include heading or topic stakeholder engagement, and consultation and engagement record.
58	VII C	van der Grient, Jesse	DOSI	The only social issue identified at NORI's San Diego global stakeholder consultation involved job losses for land-based mines? None of the subsequent concerns about social impacts expressed in written comments were raised? Also, can you cite the EIA review document that affirmed EIS methodologies and processes?	The SIA scoping document notes that a total of 632 comments were received for the subsequent Collector Test EIA, and provides footnoted references and hotlinks on page 58. The Collector Test EIS was updated in response to public comments. The EIS review by a Certified Environmental Impact Assessor, as well as public comments received, are contained in the published EIS which can be accessed on TMC's website: https://metals.co/nori/. - Social concerns raised for the Collector Test EIS include lack of a "social license", concerns about costs/impacts to Pacific Island communities, potential loss of ecosystem services (such as fisheries production), and inadequate stakeholder consultation. The SIA scoping document was designed to enable additional input and identification of social issues and concerns to be studied as part of the SIA.	TOR to include heading or topic stakeholder engagement, and consultation and engagement record.
60	VII D	van der Grient, Jesse	DOSI	In addition to a grievance management process, will there be a monitoring and reporting process for stakeholders and the public? Can you provide a description?	The social monitoring/management process has yet to be developed as part of the SIA study, and likely form one of its appendices.	TOR to include heading or topic social management pan.
68	VI C	Jackson, Julian	Pew	In providing an overview of positions of the PSIDS, also include the countries within the region that have called for a moratorium on deep sea mining. These include Palau, Fiji, Federated States of Micronesia and Samoa.	Noted.	TOR to include topic or heading regulatory context (include ISA, PSIDS, offices positions).

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69	IX	Helen Russell		Should an additional section be included here which provides some basis for informing the value judgements (in line with the IMO and other relevant international standards) on a Go/No-Go decision? My feeling on deep-sea mining is that there may be valuable to include either potential scenarios or a list of marine natural resources/ecosystems which are too unique/valuable to risk contaminating or the climatic risks are too unpredictable that we couldn't guarantee safeguards/rights (seems that we are having 100-year storms pretty frequently these days).	We plan to continue to engage with a diverse group of stakeholders, which - we expect - will attach differing values to various valued components which may influence their support for the Project. Comments and suggestions noted. "Go/No Go" examples of commitments to avoid certain areas for land-based mining include World Heritage Sites. The SIA scoping document highlights that the ISA has already identified approximately 43% of the CCZ as Areas of Particular Environmental Interest (APEI), which are already defined as "No Go" areas for deep-sea mining activities. The EIA is expected to provide additional information about this topic, identification of thresholds and uncertainties, which may drive "Go/No Go" decisions.	TOR to include heading or topic identification of valued social components, engagement, and uncertainties, and engagement.
72	X	Jackson, Julian	Pew	This section lists step (iii) “stakeholder identification (focusing on those directly affected) - as noted in the Stakeholder section NORI “defines its stakeholders as any interested individual or organization” and that the “identified listing essentially comprises the entire human population around the world”.	Noted. In line with good practice, potentially affected stakeholders, particularly those who may also be considered vulnerable and disproportionately affected, would be prioritized for engagement activities. Prizma and NOR plan outreach and engagement activities to the Pacific islands of Nauru and Fiji in March and April 2023.	TOR to include topics or headings engagement, public consultation and disclosure plan.
	Webinar	Anon.		If you want to run a robust stakeholder consultation process, it is important to allow stakeholders to ask Q anonymously. That function is not working.	Noted and action taken. Second webinar enabled anonymous comments to be submitted. The submission forms in SIA Scoping Document enable stakeholders to request anonymity. Names and context details of participant will not be disclosed, or comments attributed, unless permission granted.	TOR to include topic of confidentiality or anonymity, and attribution.
	Webinar	Anon.		With so many stakeholders, it is unlikely a consensus can be achieved as far as project viability. Can a binding moratorium be invoked by any? Is there a formal appeals process?	The SIA study will reflect the diverse views expressed by stakeholders, and acknowledge different values assigned to valued social components. Prizma is unable to comment on the legal context of moratorium and any appeals processes at this time.	TOR for SIA include ISA regulatory regime (include ISA statement about delays or moratorium, if relevant).

Page	Section	Author	Org.	Comment	Response	Action
	Webinar	Anon.	Anon.	Is NORI a member of the WEF?	It is Prizma's understanding that NORI is not a member of the World Economic Forum	TOR to include proponent (list memberships of TMC/NORI).

Page	Section	Author	Org.	Comment	Response	Action
		Dobush, Bobbi Jo	OF	Transparency requires disclosure of corporate lobbying activities, government subsidies sought and/or received for operations, and exemptions sought from the application of national environmental laws and regulations.	SIA to include corporate policies and commitments, and refer to TMC's Impact Report for other types of disclosures. With exception of Nauru's requirements as a State Sponsor, the DSM aspect of NORI-D are located in international waters and, by definition, are not subject to national requirements. The SIA to describe the applicable standards and guidelines.	TOR to include topic or heading regulatory context and corporate policies
		van der Grient, Jesse	DOSI	It is not clear how TMC and NORI are two separate entities as they share the same personnel and they are often listed together in this report. It would be good to clear this up in case there are major issues – e.g., who is responsible for bearing those?	SIA to provide additional details about the proponent and its capacity.	TOR to include topic or heading project proponent, corporate values policies
		Jackson, Julian	Pew	The economics of seabed mining are still unclear, as outlined below. Some of this ambiguity stems from the lack of consensus on the payment regime that the ISA will impose upon contractors, but a lack of clarity on corporate income tax from sponsoring States, and the expected returns for the ISA and its Members suggests further analysis would be helpful.	Noted. - The SIA Scoping document will provide a status summary. The ISA is still working on finalizing its regulatory regime. The AMC Technical Report contains and discloses assumptions made.	TOR to include topic heading regulatory context (and provide summary of applicable payment and taxation regime and/or assumptions, and use to characterize socio-economic effects)
	General	Dobush, Bobbi Jo	OF	Much of your sustainability assessment is predicated on DSM replacing terrestrial mining, but no indication that that would happen is given. Instead, the percentage of the earth's surface being mined would vastly expand with DSM. No terrestrial mining interests have agreed or offered to close or scale back their operations if TMC successfully commercializes DSM. A study commissioned by the International Seabed Authority found that while seabed mining would not cause overproduction of minerals, it may drive down prices, which scholars note may end up exacerbating terrestrial mining and its many problems.	Comment noted. The SIA scoping document highlights the expected lower social risk profile of NORI-D when compared to land-based mining. Without considering any contributions from NORI/DSM, the IEA estimates that, for nickel, up to 60 additional new mines will be required by 2030 to meet projected demand. The three dominating nickel mining countries are Indonesia, the Philippines and Russia. NORI-D - or DSM more broadly - is clearly not the driver of the reputed poor performance of some of these nickel miners today, suggesting the need for policy interventions and other reforms to improve performance with or without NORI-D/DSM activities. SIA will summarize the results of the Lapteva study focused on potentially vulnerable mining producer states and ISA's intervention instruments (economic assistance fund).	TOR to include heading or topic potentially vulnerable mining producer state (summarize Lapteva study)

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7	II. A	van der Grient, Jesse	DOSI	How is NORI supported by TMC? It seems that NORI is made up of TMC members only, or are there differences between the two? Presenting select TMC members in the NORI section also supports the idea that there is no difference between NORI and TMC. Neither could this information be found on TMC's website, and specifically on the NORI project page. This clarification will be helpful in case major issues arise – who is responsible?	SIA to provide additional details about the proponent, capacity, and corporate policies.	TOR to include heading topic about proponent (and high-level governance structure, organizational capacity, and policies)
13		Sharma	Independent	Technically nodules cannot be described as 'rocks' but as 'mineralized concretions'	By definition a rock is "a solid naturally occurring aggregate of one or more minerals" - while nodules are concretions or precipitates of manganese and iron oxide - hydroxide minerals (todorokite, birnessite, vernadite) and can be termed concretions, precipitates or nodules, they are also covered by the term rock. We prefer the term rock as it is more simply understood by the public at large.	TOR to list topic project description or glossary and define nodules
16	D.	Sharma	Independent	Table 1: Why is cutoff abundance taken as 4 kg.m2 whereas internationally it is 5 kg/m2	The cutoff grade has been determined as part of the SK 1300 resource estimate by the qualified person - AMC from a bottom-up economic assessment of break-even operating costs to recover and process nodules. This is reported in the SK 1300 Initial Assessment for the NORI - D project which is available on the TMC website.	TOR to include topic project description (include resource estimate table and cut-off grade from latest technical report)
16	D.	Sharma	Independent	Table 1: Whereas measured, indicated and inferred values for grades of Ni, Co, Mn, Si are similar, there is a drastic difference in measured +indicated and inferred values of Cu as compared to measured and indicated values given separately. Is it a typo or are the values correct (which cannot be according to me)?	That is a typo - table should reflect the figures reported in the NORI - D Initial Assessment: https://www.sec.gov/Archives/edgar/data/1798562/000121390021033645/fs42021a2ex96-1_sustainable.htm	TOR to include topic project description (include resource estimate table and cut-off grade from latest technical report)
18	D.	Sharma	Independent	Collector test: It is not clear to me if the pilot collector test was conducted in NORI-D area or somewhere else with similar nodule deposits.	The collector test was undertaken in a 4 x 2km sub-area of the NORI-D Area.	TOR to include topic project description (include brief summary about pilot collect system test)

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20	C	Sharma	Independent	1. Project 1: What is the projected demand based on which average production of 12.5 Mtpa is estimated between 2030-2045.	There are a number of forecasting groups highlighting that expected metal supply will struggle to meet demand up to 2030 and beyond. TMC has retained CRU as reported in the NORI SK 1300 Initial Assessment report "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" It is anticipated that that the metal market would easily absorb the production supplied from around 12Mtpa of polymetallic nodules.	TOR to include topic project justification (include brief summary demand forecasts)
21	III E	Jackson, Julian	Pew	Money paid to ISA - Contractor should provide more explanation to justify their assumptions regarding the IRR and expected corporate tax rates. The current projections for cumulative royalties are, as indicated in the document, are not yet finalized.	SIA scoping document refers to filed (published) Technical Report by AMC, which discloses key assumptions. Updates will be provided in SIA study, as available.	TOR to include topic project justification (include economic data and expected benefit sharing, and associated references)

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22	III E	van der Grient, Jesse	DOSI	Again, the statement about potential money gained is based on preliminary results. Stating how much tax may be paid therefore is not a fair representation of the situation. Much more language is necessary to highlight that these estimates are preliminary and by no means should be expected.	Section E/Benefit Sharing in the SIA scoping document notes that "According to AMC's 2021 Initial Assessment, the Project will generate approximately US$7.2 billion in cumulative royalties, which is mostly payable to the ISA. The detailed modalities of such payments have yet to be finalized by the ISA. This compares to ISA's 2021-2022 budget of approximately $19.5 million", and Table 4 on page 22 lists the Largest (India, DR Congo, China, Somalia, Pakistan, Bangladesh) and lowest five beneficiaries (Tuvalu, Palau, Cook Islands, Nauru, and Monaco) of DSM royalty funds based on ISA's policy briefings and modelling.	TOR to include topic project justification (include economic data and expected benefit sharing, and associated references)
22	III.E tabl	van der Grient, Jesse	DOSI	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. As per report (https://www.sec.gov/Archives/edgar/data/1798562/000121390021033645/fs42021a2ex96-1_susta inable.htm):	The SIA document also contains the full title of the AMC report filed with security market regulators, for example: AMC, 2021. Technical Report Summary, Initial Assessment [emphasis added] (Table 1, page 7, Figure 4, page 13, Section E. Project Justification, page 21). SIA scoping document notes on page 68: "...NORI has publicly indicated plans to submit an exploitation application in the near future (H2 2023). Such an application requires submission of a mining plan, a financing plan, successful nodule collector testing, an operational EIS, and other components." It is noted that E/SIA can also support and improve the planning process by, for example, engaging stakeholders, and identifying risks and opportunities.	TOR to include topic project justification (include latest published economic data and expected benefit sharing, and associated references)
23	III E	van der Grient, Jesse	DOSI	Again, the statement about potential money gained is based on preliminary results. Stating how much tax may be paid therefore is not a fair representation of the situation. Much more language is necessary to highlight that these estimates are preliminary and by no means should be expected.	SIA scoping document refers to filed (published) Technical Report produced by AMC, which discloses key assumptions. Updates will be provided in SIA study, as available.	TOR to include topic project justification (include latest published economic data and expected benefit sharing, and associated references)

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35	V C Table 5	van der Grient, Jesse	DOSI	The values in the 'with' project column are based on preliminary information and subject to change, but nowhere is this information given. For clarity, that ought to be included.	In terms of economics, the SIA scoping document uses data/refers to filed (published) Technical Report produced by AMC, which discloses key assumptions. The document also note that, according to AMC's 2021 Initial Assessment, the Project will generate approx. US$7.2 billion in cumulative royalties, which is mostly payable to the ISA. The detailed modalities of such payments have yet to be finalized by the ISA. - Updates will be provided in SIA study, as available.	TOR to include topic project justification and 'with project' alternatives (include latest published economic data and expected benefit sharing, and associated references)
35	V C Table 5	van der Grient, Jesse	DOSI	It is unclear how this project will develop and expand the ISA?	The priority allocation of DSM-related revenues flowing to the ISA would, first, cover ISA's administrative costs (currently funded by Member States), second, be allocated to an assistance fund for developing countries which may suffer serious adverse effects from DSM, before further equitable distribution. - Updates will be provided in SIA study, as available.	TOR to include topic benefit sharing (include project revenue flows to the ISA using latest published projections)

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35	V C Table 5	van der Grient, Jesse	DOSI	'no project': no positive economic ripple effect for who? The previous part of the report clearly tries to make a statement that the number of jobs created by deep-sea mining is limited. Or is this referring to tax or royalties lost? The benefits that are going to be distributed equitably; given the number of nations that are part of the ISA, that value won't be very high. Instead, it may be beneficial economically only to a small minority. Further, what capacity building will be missed out on? There will be no delay in deep-sea research as this is part of the exploration license, not exploitation license application. This is an inaccurate statement. One positive is missed: the preservation of pristine environments is ensured (that is, no additional negative environmental impacts).	There would be jobs created/supported for NORI-D, although large-scale, land-based mining projects could potentially create even more jobs given need for buidling and operating more extensive infrastructure and other needs. Table 4 lists the largest and lowest five beneficiaries of DSM royalty funds. In Prizma's opinion, the 'No Project' alternative can be reasonably expected to result in reduced level of activities (especially by the private sector), and a related reduction in marine research and training opportunities. Noted one missed positive item in the "no project" column, although Prizma's analysis, based on IPCC and other publications, would suggest that Climate Change-related impacts would continue to affect the oceans and its biodiversity significantly, and impacts related to supply of battery metals would simply shift elsewhere.	TOR to include heading or topic alternatives (to include 'no project') and socio-economic effects, and describe expected effects.
43	VI D	Jackson, Julian	Pew	The scoping document seems to imply that because the majority of the listed Potentially Vulnerable Land-Based Producer states [PVLBPS] are ISA members and "involved in its governance", no further analysis is needed. However, of the 13 identified developing countries whose economies maybe seriously affected by nodule mining, a majority are not engaged or in attendance at the ISA Council or Assembly deliberations.	Noted. This comment seems to be directed to the ISA and its Members, including PVLBPS. The foreword in Lapteva's study reminds us of the following: "Furthermore, it is important to note that provisionally identifying certain developing land based producers States as the States that may be most seriously affected does not mean that those same States will indeed be severely affected," and the study refers to the economic assistance ISA would be obliged to structure, fund from DSM royalties, and render to affected countries.	TOR to include heading or topic developing Land-based Producer States (provide summary of existing Lapteva 2022 study)

Page	Section	Author	Org.	Comment	Response	Action
	Webinar	Anon.	Anon.	What is the scale up from 1.3 to 12.5 Mtpa based on?	The SIA scoping document notes that, subject to achieving the objectives for Project Zero, NORI will propose to ramp-up operations to Project One. Full implementation of Project One as currently planned would involve a three-step progression, scaling up collection and processing from 1.3Mtpa to an approximate average of 12.5Mtpa of wet nodules at steady state production (expected 2030-2045).	TOR to include topic project description (add ramping-up information, as available)
	Webinar	Anon.	Anon.	Do you have a public relations department to address the negativity some European automakers have towards the project?	NORI answered questions affirmatively.	TOR of SIA to include stakeholder or consultation (highlighting relevant engagement, as available)
	Webinar	Anon.	Anon.	How many other seabed extraction projects are currently in operation around the world and what, if anything, have you learned from their experience?	NORI-D would be the first DSM project in the international waters of the CCZ.	TOR to note that NORI-D would be the first DSM project in international waters
	Webinar	Anon.	Anon.	It is increasingly recognised that the transition to sustainable renewable energy will require structural adjustments away from growth in resource extraction? Isn't the deep sea becoming just another sacrifice zone? And also isn't TMC counting on growing demand of cobalt, nickel, manganese and copper for batteries and electronics, what happens if these resources become redundant within short-time frames with the market already successfully looking at substitutes?	Authoritative studies noted in the SIA scoping document, and critical minerals strategy of numerous countries, suggest the need for more metals, and more diversification of sources, to enable the structural adjustment required to low carbon economies (renewables and EV cars require more metals compared to alternatives). As noted on page 23, many institutions are expecting a general growth in demand for certain metals, despite allowing for technological improvement scenarios and improved recycling. If demand for mineral resourced declines, the producers on the highest part of the cost curve are likely to experience economic pressure.	TOR to include demand forecast (highlight also drivers for growing demand).

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	Webinar	Anon.	Anon.	In economic perspective, how will you address the bias on economic/finance benefits (esp for developing countries) in SIA? who will benefit the most? the nearest countries in the contract Area (aside from the sponsoring country)? e.g. Africa vs. developing countries in S.America.	Section E/Benefit Sharing in the SIA scoping document notes that, according to AMC's 2021 Initial Assessment, the Project will generate approximately US$7.2 billion in cumulative royalties, which is mostly payable to the ISA. The detailed modalities of such payments have yet to be finalized by the ISA. Table 4 on page 22 lists the Largest (India, DR Congo, China, Somalia, Pakistan, Bangladesh) and lowest five beneficiaries (Tuvalu, Palau, Cook Islands, Nauru, and Monaco) of DSM royalty funds based on ISA's policy briefings and modelling.	TOR to include topic benefit sharing (describe latest status of revenue collection and distribution by the ISA. references)
	Webinar	Anon.	Anon.	Will you be comparing other alternatives outside extractivism like urban mining, degrowth, traditional alternatives, post extractivism?	The SIA is expected to review of alternatives of projects of a similar technical character or functionality, and should include a "zero alternative". In Prizma's experience, it is not common to include the types of alternatives identified in the comment into an ESIA. Peer reviewed references to topic noted to be considered.	TOR to provide heading alternatives and consider literature (justify inclusion/exclusions)

Page	Section	Author	Organization	Comment	Response	Action
	General	Jackson, Julian	Pew	The scoping document posits that more metals will be needed to avert the climate crisis, and that seabed mining could be a source of metals that avoids the many impacts land mining has to terrestrial environments. However, in its many comparisons between land based and deep sea mining, the document does not make clear to what extent seabed mining would actually *offset* any land projects. It seems likely that instead of *offsetting* , seabed mining will occur *in addition to* . If seabed mining is occurring in addition to land-based mining, offsets to terrestrial damage cannot be considered a benefit.	The SIA scoping document seeks to provide a comparison between land-based and DSM activities/impacts on several categories that are commonly evaluated as standard practice in preparing an E/SIA (based the IFC PS, for example). The SIA scoping document does not state that DSM will "offset" land based mining impacts or terrestrial "damage", although some of that may be reduced or avoided in the future. Clarify in TOR and ISA that NORI-D is not offsetting or closing land-based mining operations, but providing an alternative source or option to obtain scares battery metals.	TOR to include heading section project justification (clarify
	General	van der Grient Jesse	DOSI	The comparison of Co2 emissions with land-based mining operations is misleading, particularly since the primary environmental concerns are related to ecological damage, not the CO2 emissions of the operation.	Both CO2 emissions and ecological impacts are expected to be addressed in the ESIA. The SIA scoping document highlights that an on-going life-cycle assessment (LCA) of the NORI-D's nickel indicates a Global Warming Potential (GWP) of approximately 0.51kg of CO2e per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the Nickel produced from NORI-D results in 94%, 78% and 68% lower GWP, respectively. The SIA will include finalized and third-party reviewed LCA results. SIA to provide details about GHG or GWP of NORI-D.	TOR to include topics GHG and GWP (and provided updated data)
20	III D	van der Grient Jesse	DOSI	GHG emissions: it is not just nickel that is collected though. It is not clear whether this includes all the support vessels and transport to processing facilities. It is not clear how these numbers are derived (what is the breakdown)?	GHG emissions are part of the EIA and are also often reported annually in Sustainability/ESG/Impact Reports. As detailed further in its 2021 Impact Report, NORI has completed an assessment of its historic CO2 emissions from 2012-2021, which total approximately 38.5kt CO2e. For additional breakdowns and assumptions see:- Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. At the time of drafting this document, BMI LCA Results were undergoing third party verification.	TOR to include topics GHG and GWP (and provided updated data)

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24	III E	van der Grient, Jesse	DOSI	As the study is not available for the public, it is difficult to assess whether the LCA has made the proper assumptions and considerations, and thereby calculations of GWP. At this point, again, we are supposed to just trust TMC/NORI without showing proof.	The SIA scoping document notes that an "on-going life-cycle assessment (LCA) of the NORI-D's project indicates a Global Warming Potential (GWP) of approximately 0.51kg of CO_2e per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the study shows that Nickel produced from NORI-D would have 94%, 78% and 68% lower GWP, respectively. The results of the LCA are undergoing third party verification to further improve their credibility. The final LCA is expected to be available and can be included in the SIA study.	TOR to include topics GHG and GWP (and provided updated data/published reference)
27-28	III E	Jackson, Julian	Pew	This section says that it is necessary to reverse GHG trends and doing so would "*diminish extinction risks by more than 70 percent*'. This is a laudable goal, but again it is unclear how seabed mining would help achieve this goal if it is not actually offsetting any other production.	The SIA scoping document restated a referenced peer-reviewed Science article (Penn, J., and C. Deutsch, 2022. Avoiding ocean mass extinction from climate warming, Science, 28 Apr 2022, Vol 376, Issue 6592, pp. 524-526, DOI: 10.1126/science.abe9039). In Prizma's experience, the carbon footprint of commodities are becoming increasingly important ESG ratings drivers, and influence decisions of investors and the supply chain.	TOR to include section project justification and climate change (clarify relevant contributions)
29	IV A	Jackson, Julian	Pew	Processing of ore on land and transshipment of product: This will likely also occur with seabed mining. These will require a full carbon impact accounting as well.	Noted. TMC already conducted a Life Cycle Assessment (LCA) study which shows that, when compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the nickel produced from NORI-D exhibits approximately 94%, 78% and 68% lower Global Warming Potential, respectively. Providing GHGs produced from transport of nodules is recommended. The IFC PS standards require disclosure of Scope 1 and Scope 2 GHG emissions if its exceeds 25,000 tCO_2e/year, and the Equator Principles require additional studies once projected GHG emissions exceed 100,000 tCO_2e/year.	TOR to include heading/topic of GHGs emissions as stand-alone or under impact section.
31-32	IV D	Jackson, Julian	Pew	According to the report for the Deep CCZ Biodiversity Synthesis Workshop held in 2019 (https://isa.org.jm/files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_-_final), "the current network of APEIs broadly represent the climate hazards across the entire region" and "APEIs 4 and 6 may be the climate- change refugia" (p. 37, note use of word "may"). Further, due to a lack of taxonomic data, "important variables in the development of REMP such as biogeographic comparisons of species ranges to determine if APEIs could act as refuges is impossible."	Deep sea biodiversity issue are expected to be addressed in the EIA studies. Selection of APEIs is detailed on ISA's website: https://www.isa.org.jm/protection-of-the-marine-environment/regional-environmental-management-plans/ccz/. As detailed further in the SIA scoping document, by December 2021, a total of 13 APEIs were designated pursuant to the ISA's Regional Environmental Management Plan for the CCZ. These represent approximately 1.97 million km2, meaning that approximately 43% of the CCZ is protected (p 4).	TOR to include section or heading regulatory context, project location and include updated section on APEIs

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34	IV B	van der Grient Jesse	DOSI	Given that this is the basis for the SIA, why is access to renewable energy sources as a search criterion not considered in the SIA, but in a different report? That is a social aspect.	Future land-based facilities are expected to be subject to future social due diligence and/or assessments, hence the reference to those studies. Additionally, TMC/NORI's policies and commitments will be identified in the SIA study.	TOR to include headings/topics such as regulatory context and/or applicable standards, and identify also relevant policies of the proponent.
34	IV B	van der Grient Jesse	DOSI	According to a recent report published by the Guardian, it seems that carbon credits are 'empty promises' and do not result in offsetting. Perhaps TMC/NORI should consider alternatives to carbon credits rather than jump on this debunked train.	The SIA scoping document notes that the NORI-D Project would generally be expected to be among the lowest carbon intensive battery metals producing operations. The company's on-going or planned studies already include access to renewable energy sources as a search criterion and will be discussed in the ESIA or other studies related to those facilities. As detailed further in its web-published 2021 Impact Report, TMC has completed an assessment of its historic CO2 emissions from 2012-2021, which total approximately 38.5kt CO2e. TMC plans to offset these in the future using standard and blue carbon credits, which prioritize prioritizing those directly and tangibly benefitting TMC's sponsoring states.	TOR to include heading/topic of GHGs (which will also cover plans for GHG offsets)
65	IX C	van der Grient Jesse	DOSI	No statements can be made that the loss of climate regulation services are balanced out with positive effects from the project. It is well known that the creation of green technology still requires a lot of fossil fuel. It sounds like from building the ships (Netherlands) to collection to transport to land (Mexico) to transport to facilities (India) means crossing the whole world and I have not seen evidence presented that this has been considered in the carbon emission calculated for nodule operations, nor how this offsets the loss in climate regulation as presented here. Further, the data required to estimate climate regulation would include the active carbon export pump, for which no data have been collected during the collector test, so again, this is a false statement.	Opinion noted. The SIA scoping document does not state that there is an intrinsic loss of climate regulation services - but includes Regulating ESS as a component of the assessment. The LCA study for nickel referenced in the SIA scoping document for NORI-D concludes that its GWP is substantially smaller when compared to other options. As many reviewers will be aware, concentrates (intermediate product) from land-based mines are routinely shipped 'around the world'. Such transport-related GHG footprint (often considered Scope 3 GHGs) is not commonly disclosed by mining companies. For example, copper/cobalt mined in the DR Congo, may be shipped and refined in China, and related products shipped again to 'giga-factories' producing batteries for EV vehicles in other part of China or North America, and shipped once more to car assembly plants in yet other countries around the world.	TOR to include heading/topic of GHGs (which will also cover LCA, GHGs and elated topics).
81	Annex 7	Mironenko, Olga	EnvSci	"On balance, expected indirect positive effects on climate regulation" – fake fact. According to available science, deep-sea mining is not expected to have positive impacts on climate, there is not a single work of marine and climate scientists who would assume that.	Opinion noted. The SIA scoping document refers to "indirect effects" of DSM as it pertains to ESS, i.e. the increase in critical metals required for renewable energy and battery technologies. Climate related and carbon sequestration issues are expected to be contained in the EIA studies, and will be reviewed in terms of ecosystem services for the SIA.	TOR to include headings/topics of ecosystem services and GHGs (which will also cover carbon sequestration, LCA, GHGs).

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89	Annex 7	Mironenko, Olga	EnvSci	*'suggest minor impacts to carbon sequestration'* – the scope of the 89 impacts is recognized to be unknown. Which independent *publication gave NORI an assessment of 'minor'? Fake fact.*	Opinion noted. Carbon sequestration issues are expected to be described in the EIA. The reference cited to contribute to the SIA scoping document is: Beth N. Orcutt, James A. Bradley, William J. Brazelton, Emily R. Estes, Jacqueline M. Goordial, First published: 13 January 2020, https://doi.org/10.1002/lno.11403, accessed 4/14/2022	TOR to include headings/topics of ecosystem services and GHGs (which will also cover carbon sequestration, LCA, GHGs).
89	Annex 7	Mironenko, Olga	EnvSci	*'Localized carbon sequestration affects, if any, not expected to link with affects on socio-economic receptors (compared to positive contribution to decarbonizing EV/transport sector)'* - several fake facts in a row, actually. This fails to take into account several crucial things: carbon sequestration effects by definition cannot be localized, as CO2 concentration in the atmosphere is also never local. This is a purely fake science statement. CO2 concentration in the atmosphere, in its turn, always results in certain climatic patterns – and their changes, including very abrupt and sudden ones, - all over the globe. As an environmental scientist I do not see how your claim that no people and economic units will be affected, can be true. It goes counter to all climate change evidence that is out there galore. Moreover, it is precisely the island states that are impacted by climate change first. It is not scientifically valid to claim that the local island communities – socio-economic receptors in the language of your report – are not going to be impacted.	Opinion noted. The SIA scoping document notes that Small Island Developing States (SIDS) are considered vulnerable due to their isolation, exposure to climate risks, and dependency on imports. The scoping documents also refers to a life-cycle assessment (LCA), which shows that NORI-D's Global Warming Potential (GWP) per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate) is substantially lower compared to other terrestrial mining options (such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia). - The evaluation of ESS in the SIA scoping doc is not intended to evaluate carbon sequestration on a global scale - but rather how activities from NORI-D relates specifically to ecosystem services, in this case Regulating ESS. Climate related and carbon sequestration issues are contained in the EIA and will be reviewed in terms of ecosystem services for the SIA.	TOR to include headings/topics of ecosystem services and GHGs (which will also cover carbon sequestration, LCA, GHGs).
	Webinar	Anon.	Anon.	The climate crisis is being addressed by continuing the practices that caused the crisis in the first place. Mining precious metals for batteries will benefit the extraction industry, but how will it benefit those of us interested in surviving on a planet that can sustain life?	Opinion noted. The Intergovernmental Panel on Climate Change (IPCC) predicts increase of global temperature by approx. 4 degrees Celsius unless we halve GHG emissions by 2030. According to a recent article in Science, under business-as-usual global temperature increases, the marine systems are likely to experience mass extinctions on par with past great extinctions. The SIA scoping document speaks to this topic (see page 23) and summarizes numerous references illustrating the need for more metals to enable transition to low-carbon economy and reduce the use of fossil fuels. Battery metals from the deep-sea provide a new and large source of supply for 'battery metals', and exhibit a materially lower global warming potential compared to many land-based alternative mining options.	TOR to include headings/topics of GHGs and project justification (speaking to mainstream views about need for more metals to enable the goal of the Paris Climate Accord).

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	Webinar	Anon.	Anon.	How much green house gas is being put into the environment by the extraction of these metals?	GHG emissions are expected to be addressed in the ESIA. The SIA scoping document highlights that an on-going life-cycle assessment (LCA) of the NORI-D's nickel indicates a Global Warming Potential (GWP) of approximately 0.51kg of CO2e per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the Nickel produced from NORI-D results in 94%, 78% and 68% lower GWP, respectively. The SIA will include finalized and third-party reviewed LCA results.	TOR to include headings/topics of GHGs.

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10	III C2	van der Grient Jesse	DOSI	The unknown location of the existing or "brownfield" port facility and production plant locations are an issue, as how is it guaranteed that this will not be in a country that may have labor-right issues, which is especially important as TMC regularly reminds the public that deep-sea mining avoids such issues. What steps are being taken to ensure that this is indeed true?	The SIA scoping document notes in Section D. Product Stewardship, that the SIA will provide a brief description of relevant product stewardship aspects related to the Project. This means a brief description of transshipment of nodules from the collection site to onshore and – likely - "brownfield" port and warehousing facilities, and onwards transshipment for, at least initially, processing by existing "brownfield" RKEFs. It is assumed that any future construction of nodule processing facilities will be subject to their host country regulatory and permitting requirements (and not the ISA), and would also be expected to be designed to meet Good International Industry Practice (for example, the IFC Performance Standards and Equator Principles, as may be applicable).	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and include social due diligence and assessments of currently unknown/future land-based infrastructure and processing.
12		van der Grient Jesse	DOSI	Same as the comment from page 10 – what parties in Asia are considered? How are labor-right protected and ensured?	The SIA scoping document notes in Section D. Product Stewardship, that the SIA will provide a brief description of relevant product stewardship aspects related to the Project. This means a brief description of transshipment of nodules from the collection site to onshore and – likely - "brownfield" port and warehousing facilities, and onwards transshipment for, at least initially, processing by existing "brownfield" RKEFs. It is assumed that any future construction of nodule processing facilities will be subject to their host country regulatory and permitting requirements (and not the ISA), and would also be expected to be designed to meet Good International Industry Practice (for example, the IFC Performance Standards and Equator Principles, as may be applicable).	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and include social due diligence and assessments of currently unknown/future land-based infrastructure and processing.

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15	III D Table 2	van der Grient, Jesse	DOSI	Based on details provided on pages 16 and 17, the statement about the number of arriving people seems untrue for NORI's 'no'. It is likely that such seagoing activities will especially attract foreigners as often knowledge of this type of work is not present in large numbers in one country. Join any ship and you will find multiple nationalities.	Opinion noted. The offshore nodule collection activities are expected to involve a relatively small peak operating workforce (approximately 650 workers, plus approximately 200 workers distributed over several vessels). Construction and operations of large land-based mines requires thousands of workers, and often attract thousands more due to in-migration, all located in close proximity to the operation and its affected communities. We refer the reader to relevant references, such as (a) Project-induced in-migration (https://www.csrm.uq.edu.au/publications/project-induced-in-migration-and-large-scale-mining); and (b) "Understanding Project-induced in-migration (https://www.ifc.org/wps/wcm/connect/8f097545-9f7c-4e83-a5f5-a7feeada55af/Influx_Part2.pdf?MOD=AJPERES&CVID=nrOWC.i)	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover IFC and relevant IMO requirements related to labour.
19	III D	van der Grient, Jesse	DOSI	Near-misses have occurred during the baselines expeditions – are these not considered for a complete understanding of health, safety and security? What is meant by security? There was an incident with a fire in the engine room on one of the expeditions and a muster was called. Does that require consideration?	Noted. The SIA scoping document includes commonly reported health and safety statistics. For the period 2018 – 2021, TMC reported (incl. subcontractors and focused on its off-shore activities): (a) Fatalities: 0,)b) Lost Time Injury Frequency Rate: 0, (c) No significant security incidents. Prizma considers this to be objectively a very good performance, regardless if a muster had to be called for an engine room fire.	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover IFC PS and relevant IMO requirements, which also cover health and safety (and performance KPIs)
29	IV A	Jackson, Julian	Pew	In reference to conventional mining the document mentions: Mine camps: Laborers on mining ships will likely live on said ships for extended periods of time, actions should be taken to ensure their safe living conditions;	Noted. SIA to cover this topic (also part of IFC PS2)	TOR to include the topics or headings regulatory context (which will include IMO and IFC PS/PS2) employment and (which will also address safety).

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35	Table 6	van der Grient Jesse	DOSI	'with project': as the onshore facilities are not identified, there could still be a risk of child labor. This statement is thus false.	The IFC PS2 on labour incorporates core labour standards of the International Labour Organisation (ILO), including those related to child labour. Given the offshore nature of nodule collection, the SIA scoping document highlights that there is no risks in terms of potential for land conflicts or presence of child labour at the deep sea mining site. Typically, the risk of child labour - for example, for cobalt produced in the DR Congo - is connected to the presence of large-case artisanal mining activities. As noted further above, commonly used due diligence tools and assessments can be used to assess the risk of on-shore facilities.	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover social due diligence and assessment for future, land-based facilities, and cover also child labour topic.
35	Table 6	van der Grient Jesse	DOSI	What is considered as no lost incidents? As the collector test was delayed because of a broken winch. That impacted people in their work.	Lost time incidents (LTI) are common health and safety performance statistic. An LTI means a worker sustains an accident which results in time off from work, or loss of productive work (absenteeism or delays). Zero (0) LTIs means no accidents were recorded which resulted in loss of productive time. The SIA scoping document included such statistics in Table 5 (page 35): The Project activities to date have an exemplary [health and safety] record: no (0) fatalities, no (0) lost time incidents from 2018 to 2021.	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover IFC PS and relevant IMO requirements, which also cover health and safety (and performance KPIs)
63	IX B	van der Grient Jesse	DOSI	Again a sentence 'either NORI will construct or work with existing facilities onshore'. As this is not known, how can the social risks be considered? What if the general size and nature of the workforce cannot be characterized as these decisions have not been made by NORI? What does that mean for this SIA? How can we assess whether this scoping report considers all relevant aspects when the plan and data are not available to be presented?	The SIA scoping document is a preparatory document for the social impact assessment, the latter comprising a study which will be conducted in the next phase. On page 16, the SIA scoping document highlights that offshore nodule collection activities are expected to involve a relatively small peak operating workforce involving back-to-back shifts of a total of approximately 150 workers per vessel (one vessel during Project Zero, three vessels during Project One, total approximately 650 workers), and additional small crews (back-to-back shifts) for multiple nodule transport vessels totaling approximately 200 workers distributed over several vessels.	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover social due diligence and assessment for future, land-based facilities, and cover also child labour topic.

Page	Section	Author	Org.	Comment	Response	Action
64	IX B Workforce, Safety and Security	Jackson, Julian	Pew	The scoping document notes that health and safety risks would need to be managed. However, it is unclear what health and safety risks on-vessel workers may be exposed to. Table 5 (page 36) notes that to-date there have been no fatalities or incidents, and that land-based mining would have relatively higher risks. However, should NORI-D reach full operations, the risks will be different from the current exploratory phase. A better comparison that the SIA could look into are the health and safety risks for high seas fishing vessels. How long will workers be on board ships? Where will they be hired? What access do they have to labour rights and representation? What machinery will they handle on board? As the SIA develops it would be good to get more detail on how the "*security and human rights context of the Project will be considered and evaluated*" (see https://onlinelibrary.wiley.com/doi/10.1111/reel.12472).	Noted. As part of the Collector Test EIS, NOR published section 4.8.1 Risk Assessment – Health Safety & Corporate. This will provide a useful basis for operation-specific health and safety management and monitoring , and reporting of relevant key performance indicators. Allseas, the engineering partner to TMC/NORI, applies its "Allsafe" behavior-based safety programme with the ultimate goal of reducing incidents to zero. The SIA will summarize these and benchmark performance using commonly reported key performance indicators (as already identified in the SIA scoping document) with relevant industry statistics. For the ship-based activities involving a converted oil drilling ship, a suitable benchmark may include the off-shore oil industry, in addition to the international mining industry, which provide the substitute peers for battery metal production.	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover IFC PS and relevant IMO requirements, which also cover health and safety (and performance KPIs)
	Webinar	Anon.	Anon.	Please could you describe how you would be able to show that child labour would not be an issue? I ask this because there is still a land-based aspect to the project (processing).	While risk of child labour is a growing concern in the cobalt supply chain, such risks are - in practical terms - not deemed to be present or relevant for the collection of nodules from the deep-sea in remotely located CCZ. As noted in the SIA document, the risk of child labour (and other social) risks for land based facilities (such as processing) will need to be assessed once siting, processing and partnership decisions have been made, and/or help 'triage' such decisions. NORI will be advised to develop relevant policies (covering ILO's core labour standards).	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover social due diligence and assessment for future, land-based facilities, and cover also child labour topic.
	Webinar	Anon.	Anon.	Have the work conditions for the ship crew been assessed?	The SIA will need to cover IFC PS2 related to labour	TOR to include headings/topic of applicable standards and guidelines, corporate policies, and cover IFC PS and relevant IMO requirements, which also cover health and safety (and performance KPIs)
	Webinar	Anon.	Anon.	You said it would not create many jobs locally, would a high-tech collection system such as this not create a large number of well-paid jobs for support vessels and technical personnel? Similar to the Oil and Gas sector.	The estimated number of jobs for Proejct One noted in the SIA scoping document (on page 19) include 250 (existing fabrication and shipyards), 650 workers for collector vessels, 200 for transport vessels, and approx. 1,650 workers for onshore operations.	TOR to include heading/topic socio-economic impacts, which will include jobs.

Page	Section	Author	Org.	Comment	Response	Action
50	VI J -IFC PS	Jackson, Julian	Pew	PS 8 - Cultural Heritage: As noted in the scoping document "*Pacific Islanders are described as guardians or custodians of the oceans"* - part of the stakeholder outreach exercise should be to determine whether the deep sea is considered part of stakeholders' cultural heritage or part of their custodial relationship.	On pages 50-52, the SIA scoping document already describes the connection of Pacific Islanders have with the ocean and its environs. We note that Prizma/NORI will be attending and presenting on the sidelines of the next ISA meetings in Jamaica in March 2023, and plan additional outreach during planned visits to he Pacific islands of Nauru and Fiji in April and May 2023, and plan to conduct an underwater cultural heritage study.	TOR to include topics or headings traditional knowledge, migratory marine species, underwater cultural heritage, benefit sharing, engagement and consultation.
50	VI J	van der Grient, Jessie	DOSI	PS 8 – again, it does not feel right to use a common, land-based approach here. It sets the wrong precedent, and it disregards Indigenous peoples. Listening to Pacific Island Nations, it seems that DSM would affect cultural heritage, knowledge and practices.	The application of IFC PSs (and equivalents) is not limited to land-based operations. They are also used for off-shore windfarms, off-shore oil & gas projects, etc. Considering provisions by UNCLOS and the ISA, which enable PSIDS to participate in the benefits from natural resources in international waters and CCZ, having Pacific Islanders as State Sponsors of TMC/NORI and other projects in the CCZ, it seems unclear how broad conclusions appear to be reached in the comments that Pacific Islanders/Indigenous People are being disregarded. We note that NORI defines its stakeholders as any interested individual or organization (which means its inclusive of IPs/PIs). Prizma and NORI plan additional outreach during visits to he Pacific islands of Nauru and Fiji in April and May 2023, and plan to conduct an underwater cultural heritage study.	TOR to include topics or headings traditional knowledge, migratory marine species, underwater cultural heritage, benefit sharing, engagement and consultation.

Page	Section	Author	Org.	Comment	Response	Action
50	VI J	van der Grient, Jessie	DOSI	Further, it seems strange that the Common Heritage of Humankind [CHH] is here only considered via the economic benefit – as if DSM will only result in economic benefits (for all) which is a limited take. The costs need to be equally considered. Future generations may not want this to occur. The youth may not want this to occur. This take here presented is way too narrow. Also, see comments on Box 1, p. 41.	Box 1 on CHH in notes that the CHH principle is contained in UNCLOS, which embrace the goal to contribute to the realization of a just and equitable international economic order that takes into account the interests and needs of humanity as a whole and, in particular, the special interests and needs of developing countries. The ISA is the organization through which States Parties (including PSIDS) organize and control all mineral-resources-related activities in the Area for the benefit of humankind as a whole. This also means that the ISA will have to consider future generations. The ISA also has the mandate to ensure the effective protection of the marine environment from harmful effects that may arise from deep-seabed-related activities. For further information on UNCLOS, ISA and CHH, see here: https://www.isa.org.jm/. We note that ESIAs will assess +/- impacts (not limited to the positives). Also, Prizma and NORI plan additional outreach during visits to he Pacific islands of Nauru and Fiji in April and May 2023, and appreciate the recommendations to include youth during the outreach.	TOR to include topics or headings regulatory context (UNCLOS, ISA), benefit sharing (CHH), engagement and consultation (youth).

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51	PS-8	Dobush, Bobbi Jo	OF	Underwater cultural heritage (UCH) is all traces of human existence of a cultural, historical or archaeological nature. UCH is part of ocean heritage, and represents human connection to the ocean. UCH can be Polynesian people with deep cultural connection to the deep ocean (including but not limited to Native Hawaiians) may have their heritage destroyed by DSM collector vehicles and plumes.2 both tangible - artefacts, shipwrecks and human remains – including those from the tragic trans-Atlantic slave trade and intangible - the cultural or spiritual connection peoples have to the ocean.1 Respecting and protecting underwater cultural heritage is a key part of stakeholder engagement and merits increased attention. Specifically, Polynesian people with deep cultural connection to the deep ocean (including but not limited to Native Hawaiians) may have their heritage destroyed by DSM collector vehicles and plumes.	ISA draft regulations requires notification of the ISA should tangible cultural heritage be identified (none identified to date from numerous expeditions). Based on ISA draft guidance, the SIA will also include an Underwater Cultural Heritage (UCH) study, considering the 2001 Convention on the Protection of UCH (UNESCO).	TOR to include regulatory context (list UNESCO Convention), and UCH (study to be included in the SIA).

Page	Section	Author	Org.	Comment	Response	Action
55	VII Table 7	van der Grient, Jessie	DOSI	Traditional knowledge and cultural values from Pacific Islanders can be affected, but these are not included. They should be considered separately, and not be pushed into a box where Nations present at the ISA should deal with their concerns. You yourself already note that indigenous communities are not always considered or well represented, so there is an opportunity here to do better.	The Republic of Nauru, a Pacific Small Island Developing State, is the State Sponsor of NORI and its NORI-D project. Other PSIDSs which sponsor other TMC projects comprise the Kingdom of Tonga and the Republic of Kiribati. Other Pacific Islanders which sponsor other DSM projects include the Cook Islands. The SIA scoping document also highlights that the most vulnerable Pacific Islanders (PSIDS) are voting member States at the ISA. The SIA scoping document describes the connection of Pacific Islanders have with the oceans. Prizma and NORI plan to reach out to diverse stakeholders during visits to Pacific islanders of Nauru and Fiji during April/May 2023. The SIA will recognize and reflect on the fact that different stakeholders will attach differing values to various valued components which may influence their level of concerns and or support/opposition for the Project. Prizma also plans to incorporate traditional knowledge and cultural values, and NORI is expecting to conduct an Underwater Cultural Heritage (UCH) study, considering also the 2001 Convention on the Protection of UCH (UNESCO).	TOR to include topics or headings valued social components, traditional knowledge, and Underwater Cultural Heritage.
63	IX A	van der Grient, Jessie	DOSI	Also, the common heritage of humankind should be given more consideration than is given here. It should not be 'may require a broader perspective' – it does require a broader perspective. This is a new industry, the old tests for a different system do not translate and thus this requires extra care.	Comment noted. The UNCLOS convention was developed and the ISA was established given the recognition of the CHH status of the natural resources in international waters. We note that there are numerous provisions and activities through which the ISA is already applying a broader perspective. These range from empowering PSIDSs to become State Sponsors and beneficiaries, to considering the Developing Land-based Producer States which may be adversely affected, to ensuring the activities in the Area are carried out for the benefit of human kind, including through equitable distribution of benefits. NORI and the Project are expected to directly contribute to these efforts.	TOR to include topics or headings regulatory context (UNCLOS/ISA), valued social components, and Common Heritage of Humankind

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65	IX	van der Grient, Jessie	DOSI	The loss to Pacific Island cultures is not considered, nor is the loss of the common heritage of humankinds for future generations considered.	The Republic of Nauru, a Pacific Small Island Developing State, is the State Sponsor of NORI and its NORI-D project. Other PSIDSs which sponsor other TMC projects comprise the Kingdom of Tonga and the Republic of Kiribati. NORI recognizes interested Pacific Islanders as stakeholders. On pages 50-52, the SIA scoping document describes the connection of Pacific Islanders have with the oceans. We appreciate that socio-economic, socio-cultural and environmental effects are connected. They also intersect with effects on cultures. The SIA will recognize and reflect on the fact that different stakeholders will attach differing values to various valued components which may influence their level of concerns and/or support/opposition for the Project. Prizma also plans to incorporate traditional knowledge and cultural values, and conduct an Underwater Cultural Heritage (UCH) study, considering the related 2001 UNESCO Convention. We note that Prizma and NORI are planning additional engagements during in-person visits to the Pacific Islands of Nauru and Fiji during Q2/2023.	TOR to include topics or headings regulatory context (UNCLOS/ISA), valued social components, Common Heritage of Humankind (includes future generations), engagement and consultation.
65	IX	van der Grient, Jessie	DOSI	To state that there are only benefits to humankind is an overstatement – given the opposition of many people, organizations and countries, there are clear expected negative impacts which are measured in perhaps other things than just monetary values. None of these are considered here.	Section IX lists the key topic/headings and associated impacts (+/-) to be characterized in the SIA, such as Workforce, Safety & Security; Fishing, Tourism & Scientific Research; Other Social Effects Linked to ESS; Product Stewardship; Impacts on Nauru and ISA;. Impacts on Developing Land-based Producers; Cumulative Social Effects. The purpose of the SIA scoping document was to enable the inclusion of other topic and issues of concern. The E/SIA will characterize both positive and negative impacts, include non-monitory aspects, and recognizing that diverse stakeholders can be expected to attached different values to social (and other) components which will be covered in the E/SIA.	The TOR to include topics or headings that show SIA will characterize both positive and negative effects, and include non-financial aspects (such as culture and values).

Page	Section	Author	Organization	Comment	Response	Action
35	V C Table 5	van der Grient, Jesse	DOSI	'With project' does not consider the connections that cultures such as Pacific Islanders have. Instead, these are dismissed which seems like a form of disrespect to them, just because they are not physically close to the site. A	NORI recognizes any interested party, including Pacific Islanders, as its stakeholders. In addition, the Pacific Island of Nauru, is a Sponsor of NORI. On pages 50-52, the SIA scoping document describes the connection of Pacific Islanders have with the oceans, and refers to a related 2016 UNESCO study. We note that Prizma/NORI will be attending and presenting on the sidelines of the next (March 2023) ISA meeting, and plan additional engagements during in-person visits to the Pacific Islands of Nauru and Fiji in Q2/2023.	TOR to include topics or headings regulatory context (cover also Nauru, IFC PS1, PS7, PS8), VSC, traditional knowledge, migratory marine species, fishing, tourism, underwater cultural heritage, benefit sharing, stakeholder engagement and consultation.
35	V C Table 5	van der Grient, Jesse	DOSI	As onshore impacts are not determined yet because of locations, this does not allow for comparison. Why is this done like this? Why should the whole of the Pacific Ocean be considered? This is not done for land-based mining projects. Or are these to be considered as several species are highly migratory and thus can transfer effects to other areas?	Prizma does not fully understand this comment which relates to Table 5 displaying preliminary comparison of "With Project", "No Project" and "Counterfactual." - It is common for impact assessments to consider the broader/regional context, such as land/sea-scape, and other relevant factors to better understand the significance of impacts, and to review with/no project alternatives. SIA to describe social due diligence and/or assessments which may be required for future, land-based facilities. The EIA to determine impacts on relevant migratory species, and the SIA to analyze associated social impacts.	TOR to include headings or topics alternatives (also "no project"), migratory species, regulatory context (covering also corporate policies).

Page	Section	Author	Organization	Comment	Response	Action
50	VI J -IFC PS	Jackson, Julian	Pew	PS 7- Indigenous Peoples: This section notes that since “the NORI-D contract area does not feature the presence of Indigenous People or their territories” the SIA will not be considering this performance standard. However, since the NORI-D tract affects the common heritage of mankind, indigenous peoples should absolutely be consulted as stakeholders. We recommend including this performance standard in the SIA.	We note that the Pacific island of Nauru is a Sponsor and beneficiary. NORI already recognizes IP/PIs with an interest in their Project as stakeholders. IFC PS1 speaks to this aspect and is already triggered. IFC PS 7 (which considered ILO 169 and UN Declaration on the Rights of Indigenous Peoples) was also reviewed. At the time of drafting the SIA scoping document, the available data did not suggest that the NORI-D Project would impact on lands, forests, water, wildlife, and other natural resources of Affected Communities of Indigenous Peoples' institutions, livelihoods, economic development, and their ability to maintain and develop their identities and cultures. - It is noted that, in addition to past engagements, NORI also plans engagements with interested parties on the Pacific sslands of Nauru and Fiji during Q2/2023. In summary, PS7 does not have to be triggered for IPs/PIs to be consulted as stakeholders, as already planned.	TOR to include topics or headings regulatory context (to cover also Nauru, IFC PS1, PS7, and PS8), valued social components, traditional knowledge, migratory marine species, fishing, tourism, underwater cultural heritage, benefit sharing, stakeholder engagement and consultation.

Page	Section	Author	Organization	Comment	Response	Action
50	VI J	van der Grient, Jesse	DOSI	PS 7 as outlined in the report, Indigenous peoples of Pacific Islands have intrinsic relationships that transcend the distance NORI is from land. By taking this approach – only worrying about a physical distance – these people are disregarded. A conventional approach is not applicable here. Also, for the sake of balance, list the Pacific Island Nations that are against DSM beside the two that are in support of it.	We note that the Pacific Island of Nauru is a Sponsor and beneficiary. NORI already recognizes Indigenous People/Pacific Islanders as stakeholders (regardless of PS7). The SIA scoping document speaks to the cultural connection of Pacific Islanders to the ocean and its environment (also on p. 50). Physical distance and other factors are important to understand the areas of influence/impact, some of which may also connect to social/livelihood. The SIA will also cover cultural aspects, including by conducting additional engagement, considering traditional knowledge and impacts on migratory marine mammals, and conducting an underwater cultural heritage study. Prizma also plans additional engagements with interested parties during visits to Pacific Islands of Nauru and Fiji during April/May 2023. The SIA scoping document already notes on p. 51 that Tuvalu, also a PSIDS, recently rescinded its sponsorship for DSM exploration in the CCZ, and SIA can/will identify formal position on DSM of other PSIDS (all having also ISA Member voting privileges).	TOR to include topics or headings regulatory context (to cover also ISA/PSIDS, Nauru, IFC PS1, PS7, and PS8), valued social components, traditional knowledge, migratory marine species, fishing, tourism, underwater cultural heritage, benefit sharing, stakeholder engagement and consultation.
51	VI J	van der Grient, Jesse	DOSI	The location of the project's nodule collection area on Clarion Island does not address potential indirect social impacts on Indigenous People or their territories or impacts from land-based processing facilities and operations.	The Project does not involve nodule collection on/around the Clarion Island, and we assume that the comment is referring to the CCZ, an area located over a thousand of kilometers from the nearest Pacific Island/Indigenous communities. Indirect impacts will also be considered and analyzed. The social risks and impacts from future, land-based facilities would require additional due diligence or assessments to satisfy IFC PS.	TOR to include headings or topic regulatory context, VSC, traditional knowledge, migratory marine species, fishing, tourism, UCH, benefit sharing, engagement, and the SIA to describe relevant corporate polices, due diligence or assessment approach for land-based facilities.

Page	Section	Author	Organization	Comment	Response	Action
51	PS-7	Dobush, Bobbi Jo	OF	The report suggests that “NORI-D contract area does not feature the presence of Indigenous People or their territories.” This is misguided and needs to be revisited. Many Indigenous People are linked to the deep ocean floor. Further, impacts from DSM in the NORI-D may travel to coastal areas. The report goes on to say this may need to be revisited, and that engagement is intended to be inclusive. Please attend cultural events on the deep ocean at IMPAC	The preliminary screening of NORI-D's marine-side DSM in the CCZ notes that it is located over a thousand km distance from IP/PIs territories continues to be an accurate statement. Prizma recognizes - and the SIA scoping document speaks to - the cultural connection to oceans, which are also inter-connected, and does not believe that this translates to all oceans being "territories" of IP/PIs as that term is commonly understood and applied, for example, by the IFC PS. The SIA still plans to engage and identify concerns about potential impact on valued social components. This includes additional engagements planned during in-person visits to the Pacific islands of Nauru and Fiji in Q2/2023 to further integrate traditional knowledge, identify and prioritize VSC, etc.	TOR to include topics or headings regulatory context (to cover also ISA/PSIDS, Nauru, IFC PS1, PS7, and PS8), VSCs, traditional knowledge, migratory marine species, fishing, tourism, underwater cultural heritage, benefit sharing, stakeholder engagement and consultation.
63	IX A	Jackson, Julian	Pew	This section suggests that indigenous people are not present in the NORI-D mining area and so are not relevant to this project. The section also says that PSIDs are members of the ISA and so if indigenous people did have an issue they could be represented through their Member State. However, in Section VI-J the scoping document says “*some Indigenous Peoples, including some based in Hawaii (USA is an Observer at the ISA and not a member), Mexico or Canada (both ISA members), may not feel fully represented at the ISA” (p. 51).* Indigenous rights advocates and representatives are also specifically called out as stakeholders in Table 10. We recommend NORI actively seek out indigenous voices in its stakeholder outreach, and not simply rely on their representation through Member States at the ISA.	Part of the comments do not provide an accurate description of that section or NORI's position. As noted most clearly in section VII on Key Stakeholders, "NORI defines its stakeholders as any interested individual or organization," and does not qualify this in any way, such as limiting it to having a physical presence at or near the Project area (see page 53). This means that any interested IP/PSs with an interest in the Project is considered a stakeholder. Prizma is already plans engagement and consultation activities during visits to the Pacific islands of Nauru and Fiji in Q2/2023. Additional engagement and consultation opportunities are expected to be pursued during the SIA stage.	TOR to include topics or headings regulatory context (also corporate policies), valued social components, traditional knowledge, migratory marine species, fishing, tourism, underwater cultural heritage, benefit sharing, stakeholder engagement and consultation.

Page	Section	Author	Org.	Comment	Response	Action
27-28	III E	Jackson, Julian	Pew	This section claims that the NORI-D project will take up a small fraction of the CCZ and that much of the CCZ is protected by “no mining areas”. However this claim does not take into account the cumulative effects of multiple mining areas nor does it consider that the CCZ is under sampled, and much is still unknown about the seascape.	After the publication of the scoping document, an updated Draft Regulations on Exploitation of Mineral Resources in the Area, along with the recommendations prepared by the Facilitator, Ms. Raijeli Taga, highlight the need to conduct a cumulative impact assessment.	TOR to contain heading or topic CIA
66-68	IX G	Jackson, Julian	Pew	Current ISA guidance is interpreted to suggest that “no cumulative impact assessment (CIA) may be required until an exploitation application has been submitted”. It would be good to have some sense of expected cumulative effects before an exploitation application has been submitted. Table 12 lists categories to consider for cumulative assessment. This table does not appear to be exhaustive. Recommend additional components be added such as ecosystem services, marine genetic resources, biodiversity.	After the publication of the scoping document, an updated Draft Regulations on Exploitation of Mineral Resources in the Area, along with the recommendations prepared by the Facilitator, Ms. Raijeli Taga, highlight the need to conduct a cumulative impact assessment.	TOR to include heading or topic CIA (and consider the recommended components for further review and prioritization).
68	Table 12	van der Grient, Jessie	DOSI	Unclear how VSC baselines will be established and monitored over time.	Noted.	TOR to include topic or heading Social Management Plan (to include KPIs and monitoring)
72	X	Jackson, Julian	Pew	This section notes that the “approximate temporal boundary is expected to include the life of the project (2046) and/or the Paris Agreement’s net- zero milestone of 2050”. The SOI should consider the length that impacts last - as the deep sea is marked by slow life cycles, impacts could last millenia (see Simon-Lledo et al, 2019, https://www.nature.com/articles/s41598-019-44492-w)).	Noted. The SIA team will discuss the practicality of adopting such a long temporal CIA boundary during the SIA study, and if and how it might actually assist in managing potential cumulative (social) risks.	TOR to include heading or topic CIA (and consider proposed temporal boundaries).
	Webinar	Anon.	Anon.	Will there be an assessment of cumulative effects?	The SIA scoping document highlights on page 68 limited guidance on this topic by the ISA. More recent draft ISA documents indicate the need for a Cumulative Impact Assessment (CIA).	TOR to include topic CIA.

Page	Section	Author	Org.	Comment	Response	Action
	Top 5 negative attributes	Jackson, Julian	Pew	Environmental impacts from deep sea mining will have significant social, cultural, and economic impacts as outlined in our comments below	Noted	
		Jackson, Julian	Pew	While this report and the comments outlined below are primarily about the impacts from the harvesting/mining of nodules in the deep sea, the shipment to and processing of nodules on land will have a different set of societal impacts. Details about how the nodules will be processed on land should be outlined in greater clarity in order to have a fuller understanding of the life cycle of the project.	Noted	
		Jackson, Julian	Pew	The economics of seabed mining are still unclear, as outlined below. Some of this ambiguity stems from the lack of consensus on the payment regime that the ISA will impose upon contractors, but a lack of clarity on corporate income tax from sponsoring States, and the expected returns for the ISA and its Members suggests further analysis would be helpful	Noted	
		Jackson, Julian	Pew	The ISA is entrusted by treaty to develop the rules and regulations to govern deep sea mining. If the Project goes ahead before ISA member States have been able to adopt the regulatory regime, it would severely damage the legitimacy of the ISA as an institution and regulator of the industry.	Noted	
	Top Positive Attribute	Jackson, Julian	Pew	The exploitation of mineral resources of the seabed are intended to be for the Common Heritage of (hu)Mankind, so should deliver benefits across the world and across generations. Whilst this is a laudable aim, it remains unclear the extent that this project will be able to deliver this.	Noted	

Page	Section	Author	Org.	Comment	Response	Action
		van der Grient, Jesse	DOSI			
	Top Five Negative attributes			Carbon export to the deep sea	Noted	
				Fisheries support	Noted	
				Cultural values of Pacific Island communities	Noted	
				Additional impact on nature as land-based operations are not offset (and may potentially increase)	Noted	
				Loss of pharmaceutical opportunities for current and future generations.	Noted	
	Top Five Positive Attributes			Scientific knowledge generation – but this may be limited to exploration licenses only during baseline data collection.	Noted	
		Dobush, Bobbi-Jo	OF			
	Top Five Negative attributes			Underwater cultural heritage (UCH) is all traces of human existence of a cultural, historical or archaeological nature. UCH is part of ocean heritage, and represents human connection to the ocean. UCH can be both tangible - artefacts, shipwrecks and human remains – including those from the tragic trans-Atlantic slave trade and intangible - the cultural or spiritual connection peoples have to the ocean. Respecting and protecting underwater cultural heritage is a key part of stakeholder engagement and merits increased attention. Specifically, Polynesian people with deep cultural connection to the deep ocean (including but not limited to Native Hawaiians) may have their heritage destroyed by DSM collector vehicles and plumes.	Noted	

Page	Section	Author	Org.	Comment	Response	Action
				NORI's parent company, TMC, has misled investors about the likelihood of success of their operations. For example, recent TMC statements regarding ISA negotiations grossly downplay the controversy ongoing at the ISA. On November 16, 2022, CEO Gerard Barron stated that TMC was not worried about calls for a moratorium or ban on DSM because, UNCLOS "mandates the [ISA] and its Council to put in place exploration and exploitation regulations…" There are many legal bases for a moratorium, as discussed at ISA 27-III.	Noted	
				Food security: DSM operations have the potential to negatively affect fisheries catch and yield, both on the high seas (the CCZ overlaps extensively with the remit of the InterAmerican Tropical Tuna Commission) and in national waters (for example in Kiribati and Hawai`i).	Noted	
				Ecosystem Services: DSM operations may negatively affect ecosystem service (including heat and carbon sequestration) provided to humans by the deep ocean.	Noted	
				As a sponsoring state, Nauru runs the risk of legal and financial liability both under UNCLOS and outside of the UNCLOS regime in the Area (migratory animals, fisheries, or marine genetic resources) or for harm to resources in adjacent coastal states' EEZs	Noted	
	Top Five Positive Attributes			N/A	Noted	

Page	Section	Author	Org.	Comment	Response	Action
		Dobush, Bobbo-Jo	OF	As a sponsoring state, Nauru runs the risk of legal and financial liability both under UNCLOS and outside of the UNCLOS regime in the Area (migratory animals, fisheries, or marine genetic resources) or for harm to resources in adjacent coastal states' EEZs.	In 2010, at NORI's and Nauru's request, the ISA sought an advisory opinion from the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea on issues pertaining to sponsoring state responsibility. The Chamber confirmed that (1) Sponsoring states do not have strict liability, and (2) For the sponsoring state's liability to arise, there must be a causal link between the failure of that state to meet its responsibilities and the damage caused by the sponsored contractor. With the Chamber's opinion and commercial partners willing to take on the capital and technical requirements, it became possible for developing states to participate in this industry as was always envisioned by UNCLOS.	TOR to include section on regulatory context and Nauru (include summary of sponsor-state liability advisory opinion by the Chamber).
22	III E	Jackson, Julian	Pew	Further, Table 4 on benefit sharing analyzes the largest and lowest five beneficiaries of deep sea mining royalty funds - and finds Nauru to be in the lowest beneficiaries category.	This note is correct and based on modelled data provided in referenced ISA publications. - The SIA scoping document also highlights that several Pacific islands, including Nauru, have taken advantage of unique provisions for developing countries provided under UNCLOS to become Sponsors. This means that, if projects like NORI-D proceed, such Sponsors would benefit from other types of more substantial project benefits (revenues linked to nodule production, for example).	TOR to include section on benefit sharing (and include modelled equitable distribution by the ISA).

22	III E	Jackson, Julian	Pew	Given that it does not stand to gain financially through corporate income tax from NORI, will not benefit from any future benefit sharing mechanism, and will likely undertake sponsoring state liability in the event of any environmental damage caused by its contractor, the economic benefits to Nauru from the NORI D Project do not seem compelling.	Opinion noted. Pursuant to its sponsorship agreement with NORI, which is subject to review from time to time, Nauru - the State Sponsor, would receive a payment linked to quantity of nodules recovered from the exploitation contract area. - In 2010, at NORI's and Nauru's request, the ISA sought an advisory opinion from the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea on issues pertaining to sponsoring state responsibility. The Chamber confirmed that (1) Sponsoring states do not have strict liability, and (2) For the sponsoring state's liability to arise, there must be a causal link between the failure of that state to meet its responsibilities and the damage caused by the sponsored contractor. With the Chamber's opinion and commercial partners willing to take on the capital and technical requirements, it became possible for developing states to participate in this industry as was always envisioned by UNCLOS.	TOR to include section on regulatory context (add info on Chamber's opinion), benefit sharing (add modelled equitable distribution by the ISA, benefits to Nauru from Sponsorship and nodule production).

28	III E	van der Grient, Jesse	DOSI	What determines the success of NORI's training and internship opportunities? Just stating that they occurred may not be enough to determine there has been a benefit.	The SIA scoping doc briefly describes NORI's shared value approach and in line with ISA's requirements. NORI contributes to capacity building and training initiatives. In 2020 and 2021 alone, such contributions included a scholarship for post-graduate work at University of the South Pacific, training and internship opportunities for two engineers, and 11 young scientists (of which 10 women) participating in offshore campaigns, one scholarship to Nauruan national to pursue undergraduate degree in marine sciences, and other school and literacy programs. NORI is also a co-sponsor of the ISA's Secretary General's Award for Excellence in Deep-Sea Research. NORI has also committed to increasing its initiatives in the coming years and once it moves into operation. Additional details about training and community development activities of NORI are provided in TMC's 2021 Impact Report. NORI's capacity building initiates are annually reported to and published on ISA's website, allowing for external review evaluation. ISA's strategic framework for capacity building, to which contractors contribute, can be accessed here: https://www.isa.org.jm/training#:~:text=This%20was%20achieved%20through%20an%20incremental%20process%20consisting,under%20UNCLOS%20%28Review%20of%20Capacity-Building%20%26%20Workshop%20Report%29.	TOR to include topic or heading about the proponent, key policies, and ongoing social investments in capacity building)
	Webinar	Anon.	Anon.	How will Nauru, and indeed other neighbouring states benefit from this undoubtedly extremely lucrative project? You have referred to them as sponsors with the power to give the go ahead, but not as beneficiaries, so would be good to hear how these states will benefit?	The SIA scoping document highlights on page 65 that the commercial collection of nodules will result in significant Project revenues, including revenues to be distributed to Nauru, and those which accrue to the ISA. The latter will also be subject to ISA's distribution of excess revenues for the benefit of humankind. The scale and opportunities/risks associated with such new resources will be reviewed as part of the SIA.	TOR to include section on Nauru and benefit sharing

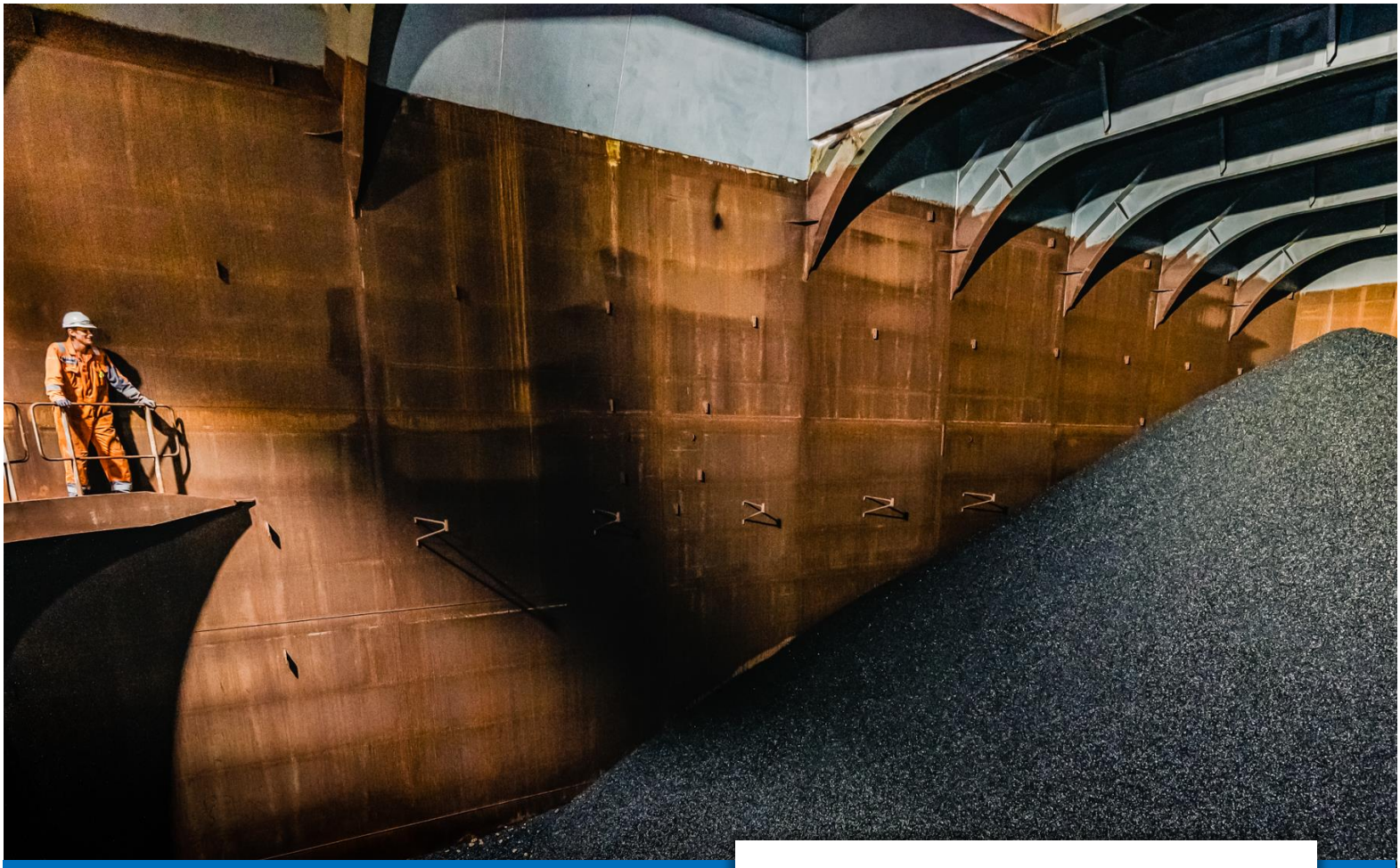
Page	Section	Author	Organization	Comment	Response	Action
	General	Zandvliet, Luc	TRA	I would also suggest finding a way to commit to including a human rights lens throughout subsequent phases of the SIA including a heat map with salient issues. Including a human rights chapter in the SIA would likely strengthen its credibility	Noted. Human Rights are also cross-cutting themes in the IFC PS (such as labour, IP, etc.).	TOR to include a heading or topic human rights, and corporate policies
	General	Zandvliet, Luc	TRA	Any mentioning of the UNGPs is suspiciously absent. I would assume there are good reasons for that? E.g. the chapter on grievance mechanisms lists an incomplete list of IFC criteria whereas it would be much more logistical to use the UNGP effectiveness criteria as the international benchmark.	Noted. Commitment to United Nations Guiding Principles on Business and Human Rights will be discussed with TMC/NORI.	TOR to include a heading or topic human rights, and corporate policies
68	IX	Russell, Helen	S4ASP	Page 68/ IX. Impacts to be Described or Studied in SIA, Table 12: Assumed valued social components to consider for consultation on cumulative assessment, balloon comment added: *I note that human rights elements are considered within this table through the cultural/provisioning ESS inclusion, however, I wondered whether there would be value in making a human-rights based statement, in order to understand the principles behind the company's approach to decision-making? This should perhaps be referred to upfront.*	Noted. As indicated in the comments, Human Rights are cross-cutting themes in the IFC PS (such as labour, IP, etc.). The SIA to add a Human Rights section, and identifying, inter alia, also related due diligence and assessments needs, also for future, land-based facilities.	TOR to include a heading or topic human rights, and corporate policies

Edits

page 35	distribution- misspelled
III.D table 3 p 18	Table 3 misses discharge pipe in description for NORI-D.
III. A p4	The referral to figure 3 should be figure 2
IV.D	Sentence to read "…up to a certain percentage"
65, IX D	Describe the genesis of nodules and time-scales required

Page	Section	Author	Org.	Comment	Response	Action
	Webinar	Anon.	Anon.	I have consulted with an investment company regarding investment in this project. This is the response I received. "it is the latest retail platform where stock ideas are promoted - classic pump and dump and short squeeze - gaming type activity". Do you have a defense of this?	Question noted. Not deemed by Prizma to be relevant to the SIA.	No explicit additions or changes to TOR required.
	Webinar	Anon.	Anon.	Have you got a view on whether or not you will have a dividend and when?	Question noted. Not deemed by Prizma to be relevant to the SIA.	No explicit additions or changes to TOR required.
	Webinar	Anon.	Anon.	You are talking about 2024, but Nasdaq has already issued a warning about a possible delisting if the share price does not rise above $1 and let you present a solution in the next months, the stock need to be above 1$ for six months according to Nasdaq's criteria.	Question noted. Not deemed by Prizma to be relevant to the SIA.	No explicit additions or changes to TOR required.
	Webinar	Anon.	Anon.	Have you considered tokenising TMC as an NFT that gives stakeholders the contract of ownership and news and events via a smart contract NFT?	Question noted. Not deemed by Prizma to be relevant to the SIA.	No explicit additions or changes to TOR required.
	Webinar	Anon.	Anon.	What reassuring message do you have for the shareholders after the announcement from the Nasdaq about a possible delist?	Question noted. Not deemed by Prizma to be relevant to the SIA.	No explicit additions or changes to TOR required.

Responder	Organization
Dobush, Bobbi Jo	The Ocean Foundation (OF)
Zandvliet, Luc	Triple R Alliance (TRA)
Russell, Helen	Solutions for a Small Planet (S4ASP)
van der Grient- Jesse	Deep Ocean Stewardship Initiative (DOSI)
Jackson, Julian	Pew Charitable Trust (Pew)
Mironenko, Olga	Environmental Scientist (EnvSci)
Dr. Rahul Sharma	Retired Chief Scientist, CSIR-National Institute of Oceanography in Goa, India (Independent)
Webinars	Anonymous



NORI
NAURU OCEAN RESOURCES INC.

PRIZMA

ANNEX 5:
RECORD OF STAKEHOLDER COMMENTS RECEIVED DURING NORI-D'S SIA SCOPING PHASE

From: Rahul Sharma <rsharmagoa@gmail.com>
Date: Thursday, January 5, 2023 at 2:39 AM
To: Stakeholders <stakeholders@nori.nr>
Cc: Michael Clarke <mike@metals.co>, Corey McLachlan <Corey@metals.co>, Jon Machin <Jon@metals.co>
Subject: NORI-D SIA Scoping document

Dear SIr / Madam (cc.Jon, Corey and Michael),

Hope you are fine and wish you a very happy new year.

As for my introduction, I am the editor of 3 books and also a consultant with 40 year of experience in deep-sea mining.

I have recently been seeing the NORI-D SIA scoping document which iI feel is very well prepared.

However, I have a few queries/ comments (listed against document page no) as follows:

1. Page 13 - Technically nodules cannot be described as 'rocks' but as 'mineralised concretions'
2. Page 16 - Table 1: Why is cutoff abundance taken as 4 kg.m2 whereas internationally it is 5 kg/m2
3. Page 16 - Table 1: Whereas measured, indicated and inferred values for grades of Ni, Co, Mn, Si are similar, there is a drastic difference in measured +indicated and inferred values of Cu as compared to measured and indicated values given separately. Is it a typo or are the values correct (which cannot be according to me)?
4. Page 18 - Collector test: It is not clear to me if the pilot collector test was conducted in NORI-D area or somewhere else with similar nodule deposits.
5. Page 18 - Monitoring: Were any sediment and fauna samples collected for impact assessment or only plume studies with sensors were conducted?
6. Page 20 - Project 1: What is the projected demand based on which average production of 12.5 Mtpa is estimated between 2030-2045.

I will be happy if you could address my queries. I have also registered for the webinar on 11 January on SIA document.

Best wishes.

Rahul Sharma

From: Mehrdad Nazari
To: Allison Rippin Armstrong; Rachel Houmphan
Subject: Comments from Helen Russel
Date: Tuesday, January 10, 2023 4:58:00 PM
Attachments: image001.png
image004.png

Hi Allison and Rachel,
Helen Russel, one of my LinkedIn connections and an independent consultant (ex-Golder, I believe), reviewed the SIA scoping doc and sent me 7 comments embedded in the PDF, which I have copied & pasted below. Perhaps good practice round to figure out how we add these sorts of comments to the database of comments, and how to respond? I found two (three?) comments to be focused on social (#3: human rights, #4?: Value judgements to be used, and #6: submerged archeological resource/an editorial correction).
Thanks, Mehrdad

1. Page 49/ Section VI. Regulatory Context: Recommend that there is specific reference to the International Maritime Organisation (IMO) standards here, as well as the need to co-ordinate with national authorities and national agencies tasked with marine protection, as well as IPIECA/OGP (who have some great tools such as the RETOS - Readiness Evaluation Tools for Oil Spills)
2. Page 65/Section IX. Impacts to be Described or Studied in SIA, C. Other Social Effects Linked to ESS: Comment for this sentence: Selected ESS are also highlighted in other IFC Performance Standards, such as PS-3 (climate change aspects); PS 4 (Community Health and Safety); PS-5 (possibly for land-based activities); PS-7 (natural resources important to Indigenous Peoples); and PS 8 (cultural heritage). Balloon comment added*: Mehrdad - this text should refer to sea-bed based ecosystem services as well such as oyster beds, seaweed beds, shrimps) and might need future-proofing and to make a statement on limiting excessive levels of mining in one specific location, either temporal limits or spatial limits depending on the ecosystem sensitivity/seasonal changes/breeding seasons. etc*
3. Page 68/ IX. Impacts to be Described or Studied in SIA, Table 12: Assumed valued social components to consider for consultation on cumulative assessment, balloon comment added: *I note that human rights elements are considered within this table through the cultural/provisioning ESS inclusion, however, I wondered whether there would be value in making a human-rights based statement, in order to understand the principles behind the company's approach to decision-making? This should perhaps be referred to upfront.*
4. Page 69/ Section, IX. Impacts to be Described or Studied in SIA, H. Other Topics: H. The objective of the public consultation for the scoping of the SIA is to obtain stakeholder input to help validate and/or identify additional social risks/opportunities which should be considered when developing the TOR and conducting the SIA study. Balloon comment added: *Mehrdad - Should an additional section be included here which provides some basis for informing the value judgements (in line with the IMO and other relevant international standards) on a Go/No-Go decision? My feeling on deep-sea mining is that there may be valuable to include either potential scenarios or a list of marine natural resources/ecosystems which are too unique/valuable to risk contaminating or the climatic risks are too unpredictable that we couldnt guarantee safeguards/rights (seems that we are having 100-year storms pretty frequently these days). The other area which should be included within the guidance document (not necessarily relevant for this project) is on landmine and UXO clearance, in case relevant where the Proejct is located.*
5. Page 70/X. Methodology For Impact & Risk Assessments/Table 13: Draft ISA Template for a Table of Content of an EIS, 10. Accidental events and natural hazards. Balloon comment added: *Mehrdad - I*

would separate out the accidental spills from the natural hazards and create two different sections here as they will likely has specific responses. The accidental spills section will obviously require very robust defences and several layers to eliminate the risks of contanimation as far as possible and specify appropriate layers of defence for each activity/untervention which has the potential to create leakages (using drilling machinery holds different risks to sea-based refuelling for example) Natural hazards feels as though this could have it's own guidance manual! especially as it is likely that both intensity and frequency of natural weatrher events will only increase in future, however, the proponent does not have any influence over. e.g. One section of risk minimisation and management strategies (e.g. worker safety which is controlled by the company) and the other section can focus on appropriate responses to climate related/weather events.

6. Page 72/ X. Methodology For Impact & Risk Assessments/ Table 14: Key ISA terms and expectations relevant to the SIA, Topic Sites of an archaeological or historical nature*, balloon comment: *Is it worth specifically referring to submerged cultural/archaeological/historical resources here as well? I have concerns that the reader would assume land-based*
7. Page 78/Annex 3: Other Relevant Convention, Protocols and Codes, row The International Marine Minerals Society's Code for Environmental Management of Marine Mining (2001). Balloon comment: *Is it worth refering to the IMO's current list of new and emerging issues here? Marine litter for example*

Mehrdad Nazari, MBA, MSc
Director, ESG, ESIA & IESC
PRIZMA LLC – Cell: +1-715-551 4395
Web: https://prizmasolutions.com/

NORI-D Polymetallic Nodule Collection Project

Stakeholder feedback form for NORI-D Social Impact Assessment Scoping

Instructions: Fill out and email as word or pdf attachment to stakeholders@nori.nr with subject "NORI-D SIA scoping consultation". An online version of this may also be filled out and accessed here.

Contact Information	
Last Name	Mironenko
First name	Olga
Name of Organization	
Type of Stakeholder*	Environmental scientist
Country	The Netherlands
Email/contact details	Mironenko.om@gmail.com
Request confidentiality (Y/N)	N
List up to 5 social/cultural/economic attributes or receptors you believe could be negatively affected by the Project	
Deep-sea ecosystems and its inhabitants	
Local communities living the closest to the areas of deep-sea mining	
Potential employees for circular economy around the globe (repair, refurbishing, recycling industries), no jobs created	
Companies: repair, refurbishment, sharing – all the circular economy businesses	
Future generations	
List up to 5 social/cultural/economic attributes or receptors you believe could be positively affected by the Project	
Nothing to add on top of what it is the draft.	
General Comments	
The draft presents a rather unbalanced position, offering pro-deep-sea-mining facts and perspectives, but gravely omitting the analysis of multiple threats and risks of deep-sea mining. Presentation of the dangers of land-based mining is not scientifically valid unless seen in a comparison with the same criteria for the deep-sea alternative. Alarmingly, most scientific allusions in this draft are either incorrect or – mostly - bluntly fake, as you will see from the comments on the annexes below. It pains me to see as a scientist that the science behind this draft does not even reflect the current scientific stance on deep-sea mining and therefore cannot be accepted as accurate and responsible.	

Specific and Prioritized Comments		
Section or Topic	Page	Comment

	55	Future generations are not on the list of the stakeholders, while they should be. The sea bottom belongs to them as well, according to UNCLOS.
Annex 5	81	Concerns of land based mining are not brought in the perspective together with the concerns of the deep-sea mining.
Annex 7	89	"On balance, expected indirect positive effects on climate regulation" – fake fact. According to available science, deep-sea mining is not expected to have positive impacts on climate, there is not a single work of marine and climate scientists who would assume that.
	89	The potential toxicity of heavy metals suspended in the water column for the fish being caught must also be mentioned in the pollution category, is currently not brought up.
	89	*'suggest minor impacts to carbon sequestration'* – the scope of the impacts is recognized to be unknown. Which independent publication gave NORI an assessment of 'minor'? Fake fact.
	89	*'Localized carbon sequestration affects, if any, not expected to link with affects on socio-economic receptors (compared to positive contribution to decarbonizing EV/transport sector)'* - several fake facts in a row, actually. This fails to take into account several crucial things: carbon sequestration effects by definition cannot be localized, as CO2 concentration in the atmosphere is also never local. This is a purely fake science statement. CO2 concentration in the atmosphere, in its turn, always results in certain climatic patterns – and their changes, including very abrupt and sudden ones, - all over the globe. As an environmental scientist I do not see how your claim that no people and economic units will be affected, can be true. It goes counter to all climate change evidence that is out there galore. Moreover, it is precisely the island states that are impacted by climate change first. It is not scientifically valid to claim that the local island communities – socio-economic receptors in the language of your report – are not going to be impacted.
	89	*'Opportunity costs: land-based mining features higher resources and GHG intensity'* – could you please provide a link to the calculations? Does this assessment include GHG and resource consumption to produce the vehicles, transport them to the CCZ, to process the nodules and get them to the shore? Does this include the non-sequestered CO2 and the carbon released from the seabottom during the operations? Making this statement is only possible on the basis of a complete and qualified LCA. NORI can only make these statements if providing full LCAs, performed by independent organizations, for both terrestrial mining and intended deep-sea operations.
	90	'waste decomposition/detoxification' is claimed to not be applicable or significant for DSM site in CCZ. Not true, as this completely disregards the often-raised issue of heavy metal poisoning of the entire water column by taking up the sediment.
	90	'ii tourism, recreation, hunting, fishing' is also said to be 'not applicable or significant for the DSM site in CCZ'. Fake fact as well.

		This also completely disregards all presently available science confirming the connectivity of species across the entire oceans with the larvae transport. Wiping out a piece of the sea bottom might break this connectivity. This also omits potential impact on tourism for countries such as Mexico and the Pacific Island States. Potential noise pollution can change migration patterns and routes of marine mammals, which can and will impact economies such as Baja California, which lives off tourism for whale-watching.
		'iii scientific exploration, education - furthering scientific knowledge of the deep oceans' is impossible when one is wiping out the study objects. Studying ecosystems is completely impossible in the process of destroying these ecosystems, let alone unethical. Another consideration to take into account here is the conscious deprivation of the future generations of a chance to do deep-sea science by mining the ocean bottom and turning it into a desert for centuries or thousands of years.
	91	'ii pathways for genetic exchange – N/A' – fake fact. This statement does not hold up, since marine scientists have been pointing out in numerous studies that in benthic marine life there is a pattern of connectivity spanning entire oceans. This means that eliminating the substrate for growth and development of this life on the plot of the seabottom may disrupt the habitual pattern of larvae transport and organisms' horizontal migration.
	68	The components to also look at would be: Impact on benthic and nodule-inhabiting marine life Damage to mankind of the present and of the future Potential of fisheries collapse Potential collapse of tourist industries Environmental impacts of deep-sea mining, including the study of noise pollution, heavy metal pollution of the water column, sediment plume impact on the benthic life in the mining zone and around it.

* Type of stakeholder may include International and State Actors, Companies, Interest Groups, Communities, Individuals or Other (please specify)

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27 January 2023

Corey McLachlan

Head of Stakeholder Engagement

The Metals Company

Vancouver, Canada

Mehrdad Nazari

Lead, ESG and IESC Advisor

Prizma LLC

Wausau, WI, USA

Via email: stakeholders@nori.nr

The Pew Charitable Trusts is an independent non-profit, non-governmental organization dedicated to serving the public interest by improving public policy, informing the public, and invigorating civic life. In its capacity as Observer to the International Seabed Authority (ISA), we wish to submit the following comments on the scoping consultation undertaken by Nauru Oceans Resources Inc (NORI) on a social impact assessment (SIA). We welcome the opportunity to provide these comments, and hope the comments are integrated into the terms of reference for the upcoming SIA Study.

First, we take this opportunity to reiterate our position that deep sea mining cannot and should not take place unless a robust, environmentally friendly, appropriately precautionary, and effectively enforceable set of rules and regulations to govern the commercial exploitation of deep sea minerals are first adopted by the ISA. The current state of negotiations on the exploitation regulations, coupled with scientific uncertainty about the environmental impacts of deep seabed mining, precludes the development of such a regulatory regime. Therefore it is premature for commercial exploitation of deep sea minerals to be undertaken in the near future in the absence of such regulations.

Regarding the social impact assessment report, we have a number of serious concerns which are outlined in detail in the attached template submission.

Broadly speaking, we are concerned about the report's characterization of the balance of risks between environmental damage and benefits to society from deep sea mining. Specifically, we have concerns about a number of inconsistencies in the assumptions provided in the report. For instance, the characterization of the habitats of the Clarion Clipperton Zone (CCZ) as one with the "lowest biomass on Earth" is misleading, seeming to imply that harm to this region will be relatively inconsequential as compared to land-based mining. The CCZ

has extremely high biodiversity, with thousands of rare species, the majority of which have yet to be identified and of those that have been identified many have only been sampled once. This rarity puts this region at considerable risk of harm from any new pressures, such as deep seabed mining [1]. Similarly, the assertion that because polymetallic nodules sit "unattached on the seafloor" and therefore their exploitation will cause minimal damage to deep sea habitats is questionable. Removal of nodules will result in removal of habitats, which will not recover on human timescales. The scoping report generally fails to provide a complete picture of the impacts from deep sea mining, for instance, neglecting to account for the potential for transboundary harm, the spatial extent of impacts and disruption to ecosystem services, and loss of marine genetic resources.

We are also concerned about the veracity of the assertion that nodule processing will not generate any tailings or toxic byproducts as this claim is unsubstantiated by the scoping report (or indeed any other publicly available document from NORI or The Metals Company).

Lastly, we are concerned with the scoping document positing that more metals will be needed to avert the climate crisis, and that seabed mining could be a source of metals that avoids the many impacts traditional mining has on terrestrial environments. In this comparison between land based and deep sea mining, the document fails to state the extent to which seabed mining would actually substitute for terrestrial mineral supply. Rather, it seems likely that if seabed mining were to occur it would be in addition to current land-based mining. If this is indeed the case, the offset to terrestrial damage from seabed mineral extraction cannot be considered a benefit of the latter – which seems to be a primary premise for the reports many arguments in favor of deep sea mining as a better alternative to terrestrial mineral exploitation.

We thank you for initiating this process and conducting a consultation for a scoping exercise; and hope that similar exercises will be conducted for the Environmental Impact Assessment process.

Sincerely,

Julian Jackson

Senior Manager, Ocean Governance

The Pew Charitable Trusts

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[1] Frontiers | Editorial: Biodiversity, Connectivity and Ecosystem Function Across the Clarion-Clipperton Zone: A Regional Synthesis for an Area Targeted for Nodule Mining (frontiersin.org); see also pending paper which estimates that 80-92% of benthic metazoan (animal) species remain to be described in the CCZ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4276976

NORI-D Polymetallic Nodule Collection Project

Stakeholder feedback form for NORI-D Social Impact Assessment Scoping

Instructions: Fill out and email as word or pdf attachment to stakeholders@nori.nr with subject "NORI-D SIA scoping consultation". An online version of this may also be filled out and accessed here.

Contact Information	
Last Name	Jackson
First name	Julian
Name of Organization	Pew Charitable Trusts
Type of Stakeholder*	"Interest Group"- NGO
Country	USA
Email/contact details	jjackson2@pewtrusts.org
Request confidentiality (Y/N)	N

List up to 5 social/cultural/economic attributes or receptors you believe could be negatively affected by the Project

- Environmental impacts from deep sea mining will have significant social, cultural, and economic impacts as outlined in our comments below.
- While this report and the comments outlined below are primarily about the impacts from the harvesting/mining of nodules in the deep sea, the shipment to and processing of nodules on land will have a different set of societal impacts. Details about how the nodules will be processed on land should be outlined in greater clarity in order to have a fuller understanding of the life cycle of the project.
- The economics of seabed mining are still unclear, as outlined below. Some of this ambiguity stems from the lack of consensus on the payment regime that the ISA will impose upon contractors, but a lack of clarity on corporate income tax from sponsoring States, and the expected returns for the ISA and its Members suggests further analysis would be helpful
- The ISA is entrusted by treaty to develop the rules and regulations to govern deep sea mining. If the Project goes ahead before ISA member States have been able to adopt the regulatory regime, it would severely damage the legitimacy of the ISA as an institution and regulator of the industry.

List up to 5 social/cultural/economic attributes or receptors you believe could be positively affected by the Project

The exploitation of mineral resources of the seabed are intended to be for the Common Heritage of (hu)Mankind, so should deliver benefits across the world and across generations. Whilst this is a laudable aim, it remains unclear the extent that this project will be able to deliver this.

General Comments

Assessment of Environmental Impacts

The scoping document currently underplays the environmental impact that deep sea mining could have. Although this is not an EIS, environmental impacts have significant social implications. Damaging the deep sea would impact the cultural values or existence values held by people around the world. Sediment discharge in the mid-water column could have economic impacts to fisheries. It is thus important to represent the environmental impacts in an upfront and clear way. A few places where environmental impacts could be better addressed:

- Characterization of CCZ and its biodiversity

- The scoping document refers to the CCZ as “common habitat” with the “lowest biomass on earth”, and notes twice the lack of plants in the CCZ. This ignores the high biodiversity and rare species that the CCZ is home to. An indicative list of what lives in the CCZ and what could be lost should be included. Please note our specific comments including those for page 7 below.

- “Unattached nodules” is misleading
  - The scoping document repeatedly uses the phrase “unattached nodules", implying minimal disruption to the environment. In footnote 42, the document notes that the top five centimeters of seabed will also be collected and discharged. This process should be detailed in the main document, with reference to what is attached to the seabed and the nodules - i.e. the CCZ’s rich biodiversity.
- Tailings
  - The document notes that there will be no tailings as a result of NORI-D. It would be helpful to have “tailings” defined with a description of how they are different from the sediment that will be dug up and discharged back into the ocean. In particular, it should be made clear whether any additives or chemicals will be added to the sediment discharge (at the seabed or in the mid-water column). Reference should also be made to the effect that sediment plumes can have on sealife (i.e. smothering, etc) More detail is also needed for the mineral processing that occurs on land. It is our understanding that perhaps a third of an ore is made up of manganese, copper, nickel, and cobalt - what happens to the remainder of the ore?

    In this investor presentation (https://www.sec.gov/Archives/edgar/data/1798562/000121390021013347/ea137001ex99-2_sustainable.htm) Deep Green reports that an ore is made up of:
    - 31% Manganese, 1.1% Copper, 1.4% Nickel, and 0.1% Cobalt
    - The rest of the nodule mass is 41% hydroxides, 18% Mg/Na/Al/Si, and 0.7% micronutrients
    - How much of this mass is returned to the seabed, discharged into the mid-water column, brought back to land for processing, and left over (unable to be sold)?

Comparison to Land-based Mines

The scoping document posits that more metals will be needed to avert the climate crisis, and that seabed mining could be a source of metals that avoids the many impacts land mining has to terrestrial environments. However, in its many comparisons between land based and deep sea mining, the document does not make clear to what extent seabed mining would actually *offset* any land projects. It seems likely that instead of *offsetting*, seabed mining will occur *in addition to*. If seabed mining is occurring in addition to land-based mining, offsets to terrestrial damage cannot be considered a benefit.

The comparisons between land-based and deep sea mining is also quite uneven throughout the document and few of the negative consequences of seabed mining are listed. In “Table 2: Comparing key aspects of generic land-based mines with NORI-D” the categories are listed such that NORI-D does not have a single negative consequence - despite evidence for many negative environmental and possibly social consequences. The same applies for “Table 5: Preliminary comparison of “With Project”, “No project” and “Counterfactual” scenarios. More evidence should be given for the counterfactuals. Please note our specific comments below for the many categories of impacts.

Stakeholder Participation

It is encouraging to see that NORI defines its stakeholder base as “as any interested individual or organization” and that their “identified listing essentially comprises the entire human population around the world”. However there seems to be a disconnect later in the document where various stakeholders are

expected to be primarily represented through their Member States at the ISA (see specific comments for pages 53-54, and page 63 below). The purpose of the SIA should be to engage with and elicit stakeholder responses directly. This SIA could be precedent setting as it is for the first project in the Area, beyond national jurisdiction, affecting the Common Heritage of Mankind. As the project is in the Common Heritage of Mankind, greater effort should be given to educate and elicit public response - including from indigenous peoples, youth, industry representatives including from fisheries and other marine users, and those listed in Table 10.

Specific and Prioritized Comments

Section or Topic	Page	Comment
About this Document	2	The project's planned SIA is described as being structured around the sections outlined in the "*ISA's Template Table of Contents for an EIS*". To clarify, is the intent that the information gained from the SIA be incorporated into Sections 6 and 9 concerning 'Description of the existing socioeconomic environment' and 'Assessment of impacts on the socioeconomic environment and proposed Mitigation', respectively? If so, NORI may want to consider additional guidance for conducting an SIA, especially as this assessment could set precedent for conducting SIAs in ABNJ. NORI should draw on resources prepared for other/similar industries and note where differences exist given the DSM context. In addition, it is worth noting that during the most recent ISA meeting several delegations agreed (without any objections from other member States) with the addition of a standalone section (9bis) to describe and evaluate any uncertainties for assessments included in the EIS (environmental, socioeconomic and cultural). The scoping report does not seem to emphasize the need to highlight uncertainties (it is only mentioned one time in the report), so we recommend this be more greatly emphasized in the ToR.
III - B - The NORI-D Project	7	The Scoping Document characterizes the CCZ abyssal plains as "*common habitats, which feature some of the lowest biomass on earth*". The CCZ is home to relatively low abundances, yet highly diverse communities. As Uhlenkott et al (2022) describe it, the CCZ is "a heterogeneous abyssal plain area….The relatively high heterogeneity of the CCZ seabed is thought to promote the development of highly diverse benthic communities" (see: https://www.nature.com/articles/s41598-022-12323-0; for more on CCZ biodiversity also see: https://www.frontiersin.org/articles/10.3389/fmars.2021.671062/full; https://www.frontiersin.org/articles/10.3389/fmars.2021.661685/full) See also the report of the workshop on deep CCZ biodiversity synthesis (https://isa.org.jm/files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_-_final.pdf) which notes that "as for many abyssal regions, rare species dominate the diversity for nearly all faunal size classes/groups for all sites, substrates, and habitats thus far sampled" and estimates that 25 to 75% of species have yet to be discovered in areas that have been sampled. In fact, a pending publication suggests that 82 to 92% of benthic metazoan (animal) species in the CCZ remain undescribed and ~60% of described species have only been sampled once. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4276976).

		The Scoping Document should take into account the high biodiversity of the CCZ and the need to protect rare species (many of which have yet to be discovered/characterized).
III - C: The Collector Test	9	This section describes that "'Adaptive Management approach to the implementation of the commercial phase of nodule collections is considered best practice for a nascent industry with a relatively short history". The article cited notes that adaptive management is interdependent with the precautionary approach and ecosystem approach, yet both of those approaches are not mentioned in the document. If this adaptive management approach is retained we recommend that the report relates how this approach is compatible with the precautionary approach and ecosystem approach (which are obligations as the draft exploitation regulations currently stand). International practice suggests that adaptive management is only compatible with precaution when there is sufficient baseline knowledge, clear and enforceable environmental objectives, processes for evaluating monitoring results to review and refine the hypotheses and the potential harm is reversible, and as such appears not to be appropriate at this time for deep-seabed mining.
III - C: The Collector Test	9	This section describes monitoring of plumes and noise, and the continuation of monitoring after the collector system test. The section should note whether the data will be made publicly available and how it will be submitted to the ISA for review.
III - C: Project One	11	Although the RKEF facilities will be in national jurisdictions and thus not necessarily in the purview of the ISA, NORI should consider expanding its description of its use of RKEF facilities to better understand their social impact. Are there socioeconomic, cultural and/or environmental impacts to consider? Are there waste stream implications to consider?
III D - Unique Attributes - Table 2	16	Table 2 is organized such that it seems as though NORI-D will have *no* impacts, with the caveat that "it is not implied that there may not be other types of impacts". This table would be more useful for the purposes of assessing impacts if it compared a comprehensive list of impacts for <u>both</u> generic land-based mines and NORI. Footnote 15 concedes that while there are no plants in the deep sea, there are other biodiversity and ecosystem service concerns (including marine genetic resources). These concerns should be brought up to the main text. There will be biodiversity impacts and there is a high diversity of life in the CCZ, even if they are not plants. There may also be upper water column disturbances from sediment plumes that do impact marine flora (phytoplankton) This section should also include impacts to other industries, such as fisheries. It is also worth noting that the environmental impacts of this industry will likely be on a spatial scale well beyond any land-based mines, with the potential of impacting adjacent coastal States. The table also notes that there will be no impacts from roads, railroads, or port linkages. However ores from seabed mining will have to be imported/exported in some manner and any resulting tailings from processing will have to be stored as well.
III D - Unique Attributes	17	This section says the nodules "*sit unattached on the seafloor*" and do not require "*removal of overburden*". However, footnote 42 (p26) notes that "*5cm of seabed sediments are expected to be entrained and collected*" and

		that some portion of this will be discharged back to the ocean "*at a depth to be determined*". The description of "unattached" nodules is misleading as the seafloor itself will be entirely removed down to 5cm, including any wildlife attached to the nodules or seafloor. Also, the NORI EIS for the collector test said the top 10-15cm of sediment would be disturbed. Is this no longer the case? It is worth noting that 90% of the sediment microbial community live in the top 10cm, and it could take decades before the microbial community recovers (https://www.science.org/doi/10.1126/sciadv.aaz5922). Further, discharging sediment back into the water column could have environmental impacts which should be more clearly noted. ((see Drazen et al 2020: https://www.pnas.org/doi/10.1073/pnas.2011914117)
III D - Unique Attributes- Table 3	18	Under "*Description*" the land option is described as an open-pit with a slurry pipeline whereas NORI-D only involves "*deep sea collection of PMN*". There should be a more even description of the two options - the NORI-D project will remove the top 5-15cm of ocean floor and involve returning a slurry of sediment to the seafloor or water column (TBD). Under "Tailing Management Facility" it would be helpful in the SIA to include information to verify the claims made in this section. Our understanding is that the minerals of interest make up roughly 33% of the nodule. So, assuming 100% efficiency and sufficient demand for those minerals of interest (which seems to be questionable at the very least for manganese) there will be 67% of the nodule left over in the form of iron, magnesium, sodium, aluminum, silicon oxides and hydroxides. It is not clear to us from publicly available resources what will happen to these materials. If they are not sold then they would need to be stored in some sort of tailings facility. More information on this would be very much appreciated. Under "*Biodiversity"*, NORI-D is described as "*located in generally common habitat*" as noted in our line for page 7 - the CCZ is highly heterogenous with high biodiversity.
III- E - Project Justification	21	Money paid to ISA - Contractor should provide more explanation to justify their assumptions regarding the IRR and expected corporate tax rates. The current projections for cumulative royalties are, as indicated in the document, are not yet finalized.
III- E - Project Justification	22	This section notes that NORI is not currently subject to corporate income tax in Nauru, and that both parties are working to "resolve this issue". This is interesting because it is difficult then to understand the economic benefits to the government from the Project. It must also be noted that the studies undertaken by MIT, which underpin the negotiations on the payment regime at the ISA, are premised on the assumption that contractors pay a 20% corporate tax rate. NORI must be transparent in the negotiations on the ISA payment regime discussions to divulge that it does not pay CIT in Nauru to help build a more accurate and informed model of the financial mechanism.

		Further, Table 4 on benefit sharing analyzes the largest and lowest five beneficiaries of deep sea mining royalty funds - and finds Nauru to be in the lowest beneficiaries category. Given that it does not stand to gain financially through corporate income tax from NORI, will not benefit from any future benefit sharing mechanism, and will likely undertake sponsoring state liability in the event of any environmental damage caused by its contractor, the economic benefits to Nauru from the NORI D Project do not seem compelling.
III - E - No Tailings Dams	26	NORI should define "tailings" and how they are different from the sediment that will be discharged in the planned project. As outlined in footnote 42, the seafloor will be dug up to a depth of 5cm. Most of the sediment will be left on the seafloor - however the sediment will no longer be in its original state. Any wildlife attached to the nodules or the seafloor will be killed. As the deep sea has slow growth and long life cycles, it is unlikely that the area will rebound back to its original state quickly. This is an environmental impact with social and cultural implications that should be noted. Additional sediment will be "*transported to the surface vessel to be separated and discharged back to the ocean at a depth to be determined"*. It is unclear whether any chemicals or additives (flocculants etc) will be used on or discharged with the sediment. Regardless, sediment discharged into the water column would have environmental impacts, it is important to consider these mid-water impacts to the wildlife living in the water column (see Drazen et al 2020: https://www.pnas.org/doi/10.1073/pnas.2011914117). Affecting mesopelagic food-webs could potentially have social implications if fisheries are affected. Although there will be no traditional tailings dam, there will certainly be leftover sediment to be disposed of with its attendant impacts. Also note our questions about tailings under our General Comments. Again, it is misleading to describe the nodules as "*unattached on the seafloor*" as the seafloor itself will be dug up along with any wildlife attached to it. Deep sea mining will also create a sediment plume that could affect an area much larger than the direct mining footprint. The sediment plume will also have environmental effects. Also, as noted in our comments on table 3, we are not convinced based on resources publicly available that there will be near zero tailings and therefore no need to store them. Over two-thirds of the nodules consist of non-target components, which will have to go somewhere. We recommend in the SIA report that more information is provided to verify this claim.
III - E - Social Impacts of Alternatives	26	The scoping document seems to claim that seabed mining would offset some amount of land based mining, thus avoiding land based social and environmental impacts. It is unclear to what extent seabed mining would *offset* these impacts rather than simply be in addition to them. This appears to be the underlying benefit of DSM expressed in this scoping report. If it is retained in the SIA report, we recommend providing

		evidence that suggests DSM will in fact offset land-based mining practices. Along these lines, it is worth noting that one could reasonably argue that opening up this new industry both disincentives addressing problems with land-based mining practices (so rather then offset actually perpetuates the problem) and puts less pressure on the need for innovative battery technology and recycling techniques to reduce the demand of these critical minerals. This counter argument should be included as a no-action alternative and should acknowledge a lot of the innovation in this space that is lowering metal demand predictions (e.g. within just the last 6 months the forecasted amount of total lithium-ion batteries that will be available for recycling in North America by 2025 went up 65%). The "*Deep Sea Mining Evidence Review"* commissioned by the UK (https://www.bgs.ac.uk/download/deep-sea-mining-evidence-review/) notes that "*From a societal perspective, it is challenging to compare the impacts of terrestrial and DSM" and that "For comparisons to be robust, they should be holistic, consider all aspects of cultural and societal impacts, all stages of the value chain, and consider long-term implications".*
III - E - Biodiversity Opportunity Costs	27-28	Generally the same comment as above - This section notes that "*Continued and sole reliance on land-based…*" metals will increase biodiversity risks. The implication seems to be that deep sea mining will help avoid those biodiversity risks, however it is unclear whether seabed mining would actually offset any land-based mining or whether both would continue. This section says that it is necessary to reverse GHG trends and doing so would "*diminish extinction risks by more than 70 percent*'. This is a laudable goal, but again it is unclear how seabed mining would help achieve this goal if it is not actually offsetting any other production. This section claims that the NORI-D project will take up a small fraction of the CCZ and that much of the CCZ is protected by "no mining areas". However this claim does not take into account the cumulative effects of multiple mining areas nor does it consider that the CCZ is under sampled, and much is still unknown about the seascape.
III - E - Marine Scientific Knowledge and Capacity Building	28	The scoping document notes that NORI will "*continue to contribute to the growing understanding of the deep-sea*". Although data has been collected during the contractor's exploration phase, it is hard to say how mining in the exploitation phase will contribute to our understanding of the deep sea. It is also arguable that scientists coming from a more academic angle would have studied the deep sea in a different manner, with different goals. The scope, motivations, mechanisms, and timescales of research done in an exploration context are likely to be quite different. Further, the scoping document notes that "*Results of these scientific studies are provided to the ISA*". Are the results publicly available? How accessible are these results? We cannot not find any of NORIs data on DeepData, nor any of the other subsidiaries of The Metals Company.

		NORI may want to verify its data is indeed publicly available through DeepData and if not, ensure through the ISA that it becomes publicly accessible. Currently the ISA is entering data into its DeepData database, however the database is still evolving and will hopefully undergo revisions in order to be more usable (see Rabone et al 2022: https://www.biorxiv.org/content/10.1101/2022.10.14.512288v1)
IV - A - Conventional Mining	29	In reference to conventional mining the document mentions: - Mine camps: Labourers on mining ships will likely live on said ships for extended periods of time, actions should be taken to ensure their safe living conditions - Removal of forests and topsoil: It should be more clearly stated, in the main text and not a footnote, that in seabed mining at least the top 5 cm of the seabed is removed along with any attached wildlife - Processing of ore on land and transhipment of product: This will likely also occur with seabed mining. These will require a full carbon impact accounting as well. - Long term effects after closure: Long term effects will also exist for seabed mining - as noted by Simon-Lledo et al (2019, https://www.nature.com/articles/s41598-019-44492-w) effects from a simulated deep-sea mining experiment were noted 26 years later. Further, "*nodule removal will also alter the character of the seafloor habitat for the very long-term (i.e. thousands of years)".*
IV - B - Deep-Sea Collection of PMN	29-30	In comparison to its description on conventional mining, this section vastly underplays the effects of PMN mining. Again, it is misleading to describe the nodules as "*unattached*" when the seabed itself is collected. The section says there will be "*No rock cutting, digging…*" this is particularly confusing when the top five centimeters of the seabed are expected to be collected. This section notes that there will be "*no removal of plants*" - however fails to mention the immense biodiversity in the CCZ that will be impacted by deep sea mining. See earlier reference to potential impacts in upper water column (photic zones) to phytoplankton - which may in turn impact the ability to absorb CO_2
IV- C - Onshore Facilities	30-31	This section outlines potential processing options that are currently being explored in India. The SIA should give more detail on these options and their social and environmental impacts, as the options develop. In order to fully understand the social impacts of NORI-D it will be necessary to know which country nodules are being shipped to and what will happen to them once they are there. Perhaps the SIA could assess different options and examine those different alternatives.
IV- D - Biodiversity Aspects	31-32	Appreciate that NORI has partnered with many research and academic institutions to study the seafloor and water column. Establishing baseline knowledge is essential to understanding this relatively unexplored area and will be important to monitoring and adaptive management should mining proceed in the future.

		The document claims that the APEIs established as "no mining zones" will act "*as* refugia *and provide repositories of genetic diversity representative of the CCZ"*. The network of APEIs are indeed an important part of protecting the seabed and are integral to regional environmental management. However, claiming the APEIs as refugia may be premature. According to the the report for the Deep CCZ Biodiversity Synthesis Workshop held in 2019 (https://isa.org.jm/files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_-_final.pdf), "the current network of APEIs broadly represent the climate hazards across the entire region" and "APEIs 4 and 6 may be the climate-change refugia" (p. 37, note use of word "may"). Further, due to a lack of taxonomic data, "important variables in the development of REMP such as biogeographic comparisons of species ranges to determine if APEIs could act as refuges is impossible." (p. 161)
IV - E - Closure	32	The scoping document says "*Prior research indicates…biomass…are expected to recover naturally over years to decades".* The SIA should cite that research. Our understanding is that recovery will take multiple decades, possible millennia. See Simon-Lledo et al (2019, https://www.nature.com/articles/s41598-019-44492-w) which states effects from a simulated deep-sea mining experiment were noted 26 years later. Further, "*nodule removal will also alter the character of the seafloor habitat for the very long-term (i.e. thousands of years)".* The scoping document also notes that a post-test long term monitoring plan for the IRZ will be submitted with the application for exploitation. More information on NORI's closure and monitoring plans would be helpful to assess social and economic implications.
V - Feasible Alternatives	35-37	"*Table 5: Preliminary comparison of "With Project", "No Project", and "Counterfactual" scenarios*" vastly oversimplifies the impacts of having or not having a seabed mining project, in ways that obviously benefit NORI's plans. We recommend this table be re-framed in a way that adequately acknowledges both the potential positives and negatives of seabed mining. Below we have provided some brief points for each of the categories to make the table more balanced, which have been expanded upon in our other comments: *Socio-economic impacts* - ● No project' - add no risk of disrupting ecosystem services (e.g. fisheries, climate regulation), no risk of losing marine genetic resources, no risk of transboundary harm to adjacent coastal States, more incentive for policy reform of existing and planned land-based practices and for innovation of both recycling and batteries technology to continue to reduce metal demand projections . ● Counterfactual - ○ for the first two bullets is there any documentation to support that these two activities will happen if DSM does not go forward? If not, they should be deleted. ○ The third point is illogical - DSM would be an additional market force and would only compensate DLBPS to offset serious impacts to their economies from DSM

		Livelihoods - ● Counterfactual - for the first two bullets is there any documentation to support that these two activities will happen if DSM does not go forward? If not, they should be deleted. Climate Change ● No Project ○ rephrase first bullet - "Growing deficit of battery metals, resulting in either increasing costs for critical metals or incentivizing policy reform and innovation of new technology thereby reducing demand predictions for critical minerals needed for the energy transition. ○ rephrase third bullet - "Continued reliance on high GHG intensity battery metals production or less reliance due to policy reform and innovative technologies driven by market and societal pressures. ● Counterfactual ○ rephrase first bullet -"Demand for battery metals met from other sources, with their own +/- impacts. Supply barriers continue for foreseeable future or new innovation of battery technologies and recycling techniques create reduce supply barriers ○ third bullet could be rephrased as above
V - D - Onshore Infrastructure	38	As noted in our General Comments and under our comment for "No Tailings Dams" for page 26 - NORI should define tailings, note what waste products will be dumped at sea, and what will happen to waste products on land.
VI - Regulatory Context	41	Appreciate the inclusion of the box on the "Common Heritage of Mankind".
VI - C Pacific Small Island Developing States	43	In providing an overview of positions of the PSIDS, also include the countries within the region that have called for a moratorium on deep sea mining. These include Palau, Fiji, Federated States of Micronesia and Samoa.
VI - D - Land-based Producer States	44	The scoping document quotes the advanced unedited version of the Lapteva et al study (2020). There is now an official 2022 version (https://www.isa.org.jm/node/21773). The scoping document seems to imply that because the majority of the listed Potentially Vulnerable Land-Based Producer states are ISA members and "*involved in its governance*", no further analysis is needed. However, of the 13 identified developing countries whose economies may be seriously affected by nodule mining, a majority are not engaged or in attendance at the ISA Council or Assembly deliberations. The purpose of the SIA should be to help stakeholders, including these Member States, understand the impacts of NORI-D. This section should offer more detail on how land-based producer states will be affected.

		The scoping document notes that the Lapteva et al study "*concluded that, for all demand growth scenarios considered for copper, nickel, and cobalt, the production by even 12 contractors would not exceed the expected demand growth*". However, the study (2020 and 2022 versions) says "*Offshore mining, under any scenario, will have a significant impact on the markets of affected metals, changing the direction and volume of supply of these metals"*. As the study itself notes, modeling the effects of seabed mining to metal markets depends on many assumptions. For copper: "*Under other consumption growth scenarios, a copper shortage may manifest itself either after 2032 or not at all, as all the world economy's copper needs may be met by land-based production and secondary metal*." For nickel: "*Only if nickel consumption growth rates are higher than the low scenario of consumption growth, the beginning of offshore mining will not cause overproduction of the metal"* For cobalt: "*However, significant overproduction of cobalt can be expected up to 2028 and is difficult to avoid. As a result, such large stocks of cobalt may accumulate in various warehouses that insufficient production would be compensated for by these stocks for a long time to come"* The SIA should look at the nuances of this study and whatever other materials may be available, to determine effects to land-producer states.
VI - F - ISA's Regional Environmental Management Plans	46	The LTC's 2021 "Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone" (ISBA/26/C/43) includes many pending steps that will need to be accomplished prior to assessing an application for exploitation. The ISA will need to review the CCZ EMP again before accepting exploitation applications.
VI - I - The Republic of Nauru	49	Please note our comments above under "III- E - Project Justification" "page 22".
VI - J - IFC Performance Standards	50	PS 5 - Understandable that land acquisition and involuntary resettlement will not play a role at sea, however this section also claims that *"potential environmental effects of NORI-D in the CCZ will not likely generate significant adverse livelihood effects*". Can NORI-D provide more evidence for this claim - in particular for effects to fisheries? PS 7- Indigenous Peoples: This section notes that since "*the NORI-D contract area does not feature the presence of Indigenous People or their territories*" the SIA will not be considering this performance standard. However, since the NORI-D tract affects the common heritage of mankind, indigenous peoples should absolutely be consulted as stakeholders. We recommend including this performance standard in the SIA.

		PS 8 - Cultural Heritage: As noted in the scoping document "*Pacific Islanders are described as guardians or custodians of the oceans"* - part of the stakeholder outreach exercise should be to determine whether the deep sea is considered part of stakeholders' cultural heritage or part of their custodial relationship.
VII - Key Stakeholders	53-54	Appreciate that NORI "*defines its stakeholders as any interested individual or organization"* and that the "*identified listing essentially comprises the entire human population around the world*". Given that the NORI-D project will affect the common heritage of mankind, this is an appropriate definition. One category of actors that is missing from Table 10 is other industries - for example fishing and shipping. It is possible that seabed mining could affect these industries and so their input should be included. Other marine users should also be identified Another category missing from the list is youth - the next generation of business leaders and environmental activists should be actively consulted. We recommend that stakeholders be proactively involved and asked for input - it will not be enough to simply ask interested parties to check a website or be on a specific distribution list. As this project will affect the common heritage of mankind, and noting that the general public is still largely not aware of seabed mining, it could be useful to have a wider societal discussion on the industry.
IX - A - Identification of Key Issues	62	This section refers to the ISA's draft regulations and topics that should be covered in the EIS. We recommend NORI survey the literature on SIAs to see if any further topics or steps should be included as best practice.
IX - A - Identification of Key Issues	63	This section suggests that indigenous people are not present in the NORI-D mining area and so are not relevant to this project. The section also says that PSIDs are members of the ISA and so if indigenous people did have an issue they could be represented through their Member State. However, in Section VI-J the scoping document says "*some Indigenous Peoples, including some based in Hawaii (USA is an Observer at the ISA and not a member), Mexico or Canada (both ISA members), may not feel fully represented at the ISA" (p. 51).* Indigenous rights advocates and representatives are also specifically called out as stakeholders in Table 10. We recommend NORI actively seek out indigenous voices in its stakeholder outreach, and not simply rely on their representation through Member States at the ISA.
IX - B - Workforce, Safety, & Security	64	The scoping document notes that health and safety risks would need to be managed. However, it is unclear what health and safety risks on-vessel workers may be exposed to. Table 5 (page 36) notes that to-date there have been no fatalities or incidents, and that land-based mining would have relatively higher risks. However, should NORI-D reach full operations, the risks will be different from the current exploratory phase. A better comparison that the SIA could look into are the health and safety risks for high seas fishing vessels. How long will workers be on board ships? Where will they be hired? What access do they have to labour rights and representation? What machinery will they handle on board?

		As the SIA develops it would be good to get more detail on how the "*security and human rights context of the Project will be considered and evaluated*" (see https://onlinelibrary.wiley.com/doi/10.1111/reel.12472).
IX - Bii - Fishing, Tourism & Scientific Research	64	This section notes that the sediment plumes generated at the sea floor and in the midwater column will be monitored during the collector test and that *"such linkage to socio-economic receptors will be a focus of the SIA*". This will be key information in determining effects to the environment and to fisheries. More information on how this data will be collected and analysed would be appreciated. It is not clear what the linkage between plume generation and "socioeconomic receptors" is.
IX - C - Other Social Effects Linked to ESS	64	The SIA should also consider effects to: Provisioning ESS: Pharmaceuticals and biomaterials Cultural ESS: Existence values, option use values, stewardship values, aesthetic values - there are likely many cultural reasons to protect the deep sea beyond science and education (although those are important too) Under Regulating and Supporting ESS the document notes potential positive effects, however there are also potential negative effects given the disruption mining will cause to the environment (including negative impacts to charismatic mega fauna - noise) and other highly migratory species of concern). Levels of uncertainty should also be highlighted. The CCZ is still a relatively unexplored area with the degree and longevity of effects still unknown. Consider consulting Le & Sato 2017 (https://www.ocean-climate.org/wp-content/uploads/2017/03/ecosystem-services-deep-ocean_ScientificNotes_Oct2016_BD_ppp-9.pdf) and Thurber et al 2014 (https://bg.copernicus.org/articles/11/3941/2014/)
IX - D - Product Stewardship	65	Although processing facilities will be subject to host country regulatory and permitting requirements and not the ISA, some understanding of onshore effects would be useful for a full understanding of the project.
IX - E - Impacts on Nauru and the ISA	65	Please note our comments above under "III- E - Project Justification" "page 22".
IX - F - Impacts on Developing Land-base Producers	65	Please note our comments above under "VI - D - Land-based Producer States" "page 44".
IX - G - Cumulative Social Effects	66-68	Current ISA guidance is interpreted to suggest that "no cumulative impact assessment (CIA) may be required until an exploitation application has been submitted". It would be good to have some sense of expected cumulative effects before an exploitation application has been submitted. Table 12 lists categories to consider for cumulative assessment. This table does not appear to be exhaustive. Recommend additional components be added such as ecosystem services, marine genetic resources, biodiversity.

X- Methodology for Impact & Risk Assessments	72	This section lists step (iii) "stakeholder identification (focusing on those directly affected) - as noted in the Stakeholder section NORI "defines its stakeholders as any interested individual or organization" and that the "identified listing essentially comprises the entire human population around the world".
X- Methodology for Impact & Risk Assessments	72	This section notes that the "approximate temporal boundary is expected to include the life of the project (2046) and/or the Paris Agreement's net-zero milestone of 2050". The SOI should consider the length that impacts last - as the deep sea is marked by slow life cycles, impacts could last millenia (see Simon-Lledo et al, 2019, https://www.nature.com/articles/s41598-019-44492-w)).
Annex 5 - Changes induced by terrestrial mining that can lead to social impacts and risks	81-85	There should be an equivalent table of changes induced by seabed mining that could lead to social impacts and risks, which should address many of the concerns/impacts we have raised throughout this submission.
Annex 7 - Preliminary review of potential Ecosystem Services effects of the Project	89-91	Note specific comment for page 64
Annex 8 - Applying IFC's sample indicators for incremental versus cumulative impacts to the Project	94	Several categories note that "Siting of onshore/processing facilities unknown, future analysis required at a later date". It will be hard to assess the social/economic impacts if analyses are not carried out until after the SIA. "Addition of mortality to a wildlife population" implies that because 42% of the CCZ is protected under APEIs, the project will not reach significant livelihood threshold levels. More evidence needs to be given on this account, especially taking into account the CCZ's high biodiversity levels.

* Type of stakeholder may include International and State Actors, Companies, Interest Groups, Communities, Individuals or Other (please specify)

From:	Rachel Houmphan
To:	Mehrdad Nazari; Allison Rippin Armstrong
Cc:	Corey McLachlan
Subject:	FW: SIA Scoping Report feedback
Date:	Monday, January 30, 2023 6:44:40 PM
Attachments:	image847351.png image440527.png

Mehrdad and Allison,

Some further comments.

Regards,
Rachel

the metals company

Rachel Houmphan | Social Impact and Stakeholder Engagement Lead

metals.co

-----Original Message-----
From: Luc Zandvliet <luc.zandvliet@tripleralliance.ca>
Sent: January 28, 2023 9:38 AM
To: Rachel Houmphan <Rachel.Houmphan@metals.co>
Subject: SIA Scoping Report feedback

Hi Rachel;

Thanks for forwarding the SIA Scoping report. Following are my comments.

1. I very much like that the Scoping Report is a public report and available to 'anyone' to provide input. I think that is the first time I see this approach is taken and it is fitting for the context of the project.

2. In particular, it is difficult to involve "the community" in a public consultation and disclosure plan. The report includes a number of Prisma's opinions that are a consultant's opinion (e.g. related to the applicability of IFC PS 7) and could be debated. The current review process allows for these opinions to be challenged. I like Prisma's clarity re: which ideas are theirs so that the report can be read against this background.

3. Any mentioning of the UNGPs is suspiciously absent. I would assume there are good reasons for that? E.g. the chapter on grievance mechanisms lists an incomplete list of IFC criteria whereas it would be much more logistical to use the UNGP effectiveness criteria as the international benchmark.

4. I would also suggest finding a way to commit to including a human rights lens throughout subsequent phases of the SIA including a heat map with salient issues. Including a human rights chapter in the SIA would likely strengthen its credibility.

5. The tone and style of the report are fine. At times though it reads as overly-pro deep sea mining, which slightly reflects on the credibility to the report. For example, the reference to Brumadinho and the Church of England requirements re: tailings reads funny when the report (rightly) acknowledges in various places that the environmental/biodiversity impacts of the project have yet to be determined. It is not bad to compare conventional mining verses deep sea mining but I would be weary using worst case scenario's in conventional mining as a justification for the project. I was not crazy about the comparison with Ambatovy either but found that table less worrying.

6. Reading the report as a neutral reader, a concern I would have is the unfinished and wobbly ISA benefit sharing approach as well as the significant payment of onshore tax to the host nation of the processing plant. With the stakes this high ($9.2 billion is no joke!) and Nori's ability to process nodules anywhere, the risk of royalty payments, ISA Management of the Economic Assistance Fund the risk of benefit distribution becoming a socio- political mess is considerable. I would see competition between countries over hosting a processing plant, as well as ISA's ability to distribute financial benefit as potentially fraught given that the mechanism has yet to be finalized. Other than risks of corruption and 'horse trading' between countries I could also see countries offering very attractive conditions to Nori, possibly at the expense of worker rights in processing plants. And, Nori's could ultimately be linked to these impacts from a human rights perspective (corruption is increasingly viewed in human rights terms). In other words, I would include a risk assessment (to people as well as to the company) in the SIA and describe mitigation measures where appropriate.

7. The report makes several references to the fact that the process does not include any tailings. But that begs the question what impacts are related to the on-shore process. The report indicates these impacts will be excluded from the SIA and that assessments of such impacts will be provided by the national legislation of the processing facility. Although I understand that the logic, it leaves the reader rather unsatisfied. I would suggest to at least commit to conducting an ESIA against international standards once the on-shore facilities have been determined.

NORI-D Polymetallic Nodule Collection Project

Stakeholder feedback form for NORI-D Social Impact Assessment Scoping

Instructions: Fill out and email as word or pdf attachment to stakeholders@nori.nr with subject "NORI-D SIA scoping consultation". An online version of this may also be filled out and accessed here.

Contact Information	
Last Name	Dobush
First name	Bobbi-Jo
Name of Organization	The Ocean Foundation
Type of Stakeholder*	ISA Observer, Civil Society Organization
Country	United States
Email/contact details	bdobush@oceanfdn.org
Request confidentiality (Y/N)	N
List up to 5 social/cultural/economic attributes or receptors you believe could be negatively affected by the Project	
Underwater cultural heritage (UCH) is all traces of human existence of a cultural, historical or archaeological nature. UCH is part of ocean heritage, and represents human connection to the ocean. UCH can be both tangible - artefacts, shipwrecks and human remains - including those from the tragic trans-Atlantic slave trade and intangible - the cultural or spiritual connection peoples have to the ocean.[1] Respecting and protecting underwater cultural heritage is a key part of stakeholder engagement and merits increased attention. Specifically, Polynesian people with deep cultural connection to the deep ocean (including but not limited to Native Hawaiians) may have their heritage destroyed by DSM collector vehicles and plumes.[2]	
NORI's parent company, TMC, has misled investors about the likelihood of success of their operations.[3] For example, recent TMC statements regarding ISA negotiations grossly downplay the controversy ongoing at the ISA. On November 16, 2022, CEO Gerard Barron stated that TMC was not worried about calls for a moratorium or ban on DSM because, UNCLOS "mandates the [ISA] and its Council to put in place exploration and exploitation regulations…"[4] There are many legal bases for a moratorium, as discussed at ISA 27-III.	

[1] https://oceanfdn.org/wp-content/uploads/2022/12/TOF-Seabed-Mining-UCH-ISA-27.pdf

[2] Papahānaumokuākea National Marine Sanctuary, Using a Biocultural Lens to Build Pilina (relationships) to the Kai Lipo (deep sea ecosystems) https://sanctuaries.noaa.gov/education/teachers/utilizing-a-biocultural-lens-to-build-to-the-kai-lipo.html; https://dsm-campaign.org/blue-peril/

[3] https://oceanfdn.org/digging-for-the-truth-on-the-metals-company/

[4] https://www.watertowerresearch.com/calendar_events/tmc-the-metals-company-inc-nasdaq-tmc-chairman-ceo-gerard-barron-and-cfo-craig-shesky

Food security: DSM operations have the potential to negatively affect fisheries catch and yield, both on the high seas (the CCZ overlaps extensively with the remit of the InterAmerican Tropical Tuna Commission)[5] and in national waters (for example in Kiribati and Hawai`i).[6]
Ecosystem Services: DSM operations may negatively affect ecosystem service (including heat and carbon sequestration) provided to humans by the deep ocean.[7]
As a sponsoring state, Nauru runs the risk of legal and financial liability both under UNCLOS[8] and outside of the UNCLOS regime in the Area (migratory animals, fisheries, or marine genetic resources) or for harm to resources in adjacent coastal states' EEZs.[9]
List up to 5 social/cultural/economic attributes or receptors you believe could be <u>positively</u> affected by the Project
n/a
General Comments
If this project wants to engage stakeholders, attend ocean environment gatherings and make project leaders available. For example, IMPAC5 upcoming in Vancouver has various panels on the deep ocean, including cultural connection thereto.
Transparency requires disclosure of corporate lobbying activities, government subsidies sought and/or received for operations, and exemptions sought from the application of national environmental laws and regulations.
Much of your sustainability assessment is predicated on DSM replacing terrestrial mining, but no indication that that would happen is given. Instead, the percentage of the earth's surface being mined would vastly expand with DSM. No terrestrial mining interests have agreed or offered to close or scale back their operations if TMC successfully commercializes DSM. A study commissioned by the International Seabed Authority found that while seabed mining

[5] J.M.A. van der Grient, J.C. Drazen, Potential spatial intersection between high-seas fisheries and deep-sea mining in international waters, Marine Policy, https://doi.org/10.1016/j.marpol.2021.104564;

[6] https://dsm-campaign.org/wp-content/uploads/2022/09/Blue-Peril-Technical-Paper.pdf

[7] https://www.dosi-project.org/wp-content/uploads/Deep-Ocean-Ecosystem-Services-Brief.pdf

[8] See Proelss, A., Steenkamp, R.C. (2023). Liability Under Part XI UNCLOS (Deep Seabed Mining). In: Gailhofer, P., Krebs, D., Proelss, A., Schmalenbach, K., Verheyen, R. (eds) Corporate Liability for Transboundary Environmental Harm. Springer, Cham. https://doi.org/10.1007/978-3-031-13264-3_13) (""Gaps in current domestic legislation may entail non-compliance with [UNCLOS] Article 235, which entails a failure of a State's due diligence obligations and has the potential to expose States to liability.")

[9] CIGI, Legal Liability for Environmental Harm: Synthesis and Overview, p. 23 https://www.cigionline.org/static/documents/documents/Deep%20Seabed%20paper%20no.1_3.pdf ("Activities in the Area could also result in damage to living and non-living resources, the marine environment, persons and property … in areas under coastal state jurisdiction [and] the coastal state would prima facie be considered the injured state with sufficient legal interest to bring claims.")

would not cause overproduction of minerals, it may drive down prices[10], which scholars note may end up exacerbating terrestrial mining and its many problems.[11]		
The issues listed here are non-exhaustive, and TOF's provision of feedback is not an endorsement of the NORI-D social impact assessment scoping process.		
Specific and Prioritized Comments		
Section or Topic	Page	Comment
PS 7 Indigenous Peoples	51	The report suggests that "NORI-D contract area does not feature the presence of Indigenous People or their territories." This is misguided and needs to be revisited. Many Indigenous People are linked to the deep ocean floor. Further, impacts from DSM in the NORI-D may travel to coastal areas.[12] The report goes on to say this may need to be revisited, and that engagement is intended to be inclusive. Please attend cultural events on the deep ocean at IMPAC5.

* Type of stakeholder may include International and State Actors, Companies, Interest Groups, Communities, Individuals or Other (please specify)

[10] Lapteva Anna, Chernova Alexandra, Khodina Marina, Mustafa Tatiana, Mustafina Farida, and Smolnikova Anastasiya from All-Russian Scientific-Research Institute of Mineral Resources Named after N.M. Fedorovsky (FSBI "VIMS"). Study of the Potential Impacts of Polymetallic Nodules Production from the Area on the Economics of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affect, Report to the International Seabed Authority (advanced unedited version), 12 May 2020, https://www.isa.org.jm/files/documents/impactstudy.pdf (paras. 296, 299).

[11] Pradeep Singh, Deep Seabed Mining and Sustainable Development Goal 14, W. Leal Filho et al. (eds.), Life Below Water, Encyclopedia of the UN Sustainable Development Goals, https://doi.org/10.1007/978-3-319-71064-8_135-1 p. 10 ("deep seabed mining might end up further exacerbating terrestrial mining activities, resulting in deleterious consequences occurring simultaneously on land and at sea.

[12] https://dsm-campaign.org/blue-peril-tool-kit/

NORI-D Polymetallic Nodule Collection Project

Stakeholder feedback form for NORI-D Social Impact Assessment Scoping

Instructions: Fill out and email as word or pdf attachment to stakeholders@nori.nr with subject "NORI-D SIA scoping consultation". An online version of this may also be filled out and accessed here.

Contact Information	
Last Name	van der Grient
First name	Jesse
Name of Organization	Deep Ocean Stewardship Initiative
Type of Stakeholder*	Other
Country	N/A
Email/contact details	grientj@hawaii.edu
Request confidentiality (Y/N)	N
List up to 5 social/cultural/economic attributes or receptors you believe could be negatively affected by the Project	
Carbon export to the deep sea	
Fisheries support	
Cultural values of Pacific Island communities	
Additional impact on nature as land-based operations are not offset (and may potentially increase)	
Loss of pharmaceutical opportunities for current and future generations.	
List up to 5 social/cultural/economic attributes or receptors you believe could be positively affected by the Project	
Scientific knowledge generation – but this may be limited to exploration licenses only during baseline data collection.	
General Comments	
There are a lot of statements presented in the scoping report that cannot be verified. There are also a lot of promises in here that cannot be guaranteed. That makes assessing this scoping report difficult. What is the value of this assessment, and what are the safeguards for presenting outcomes? It seems that the timing of this report is not in line with the timeline for when data are available, which has implications for this work. This includes the collector test results and EMMP results. It gives the impression that this work is rushed.	
There seems to be a lot of repetition of arguments in this report focused on only benefits of deep-sea mining. Where are the considerations for the negative impacts? These only seem presented when considering land-based mining projects,	

and especially ones that have a reputation for having negative impacts. Why are comparisons not made with terrestrial mines that are equivalent in rules and regulations as the proposed NORI-D? Why are the negative impacts of the proposed NORI-D not presented in a similar way as the negative terrestrial mines? Right now, this report risks coming off as cherry-picking facts to make the NORI-D project look exceptionally good.
Several statements are made based on preliminary data or are unsupported in general. This is not clearly identified or evaluated in the report. This lack of focus risks limiting the assessment and its scope.
It also seems odd that this report seems insistent on using land-based standards for something that is not land based. It would benefit this effort to evaluate deep-sea mining focused on deep-sea mining impacts and criteria, allowing for better evaluations. Right now, it seems like a comparison of oranges with apples. (A better comparison might be to dredge mining or deep sea oil drilling, where we know environmental consequences have sometimes been severe.)
Some important literature does not seem to have been consulted, and instead are supported by 'observations from NORI' which are not adequate.
It is not clear how TMC and NORI are two separate entities as they share the same personnel and they are often listed together in this report. It would be good to clear this up in case there are major issues – e.g., who is responsible for bearing those?
The comparison of Co2 emissions with land-based mining operations is misleading, particularly since the primary environmental concerns are related to ecological damage, not the CO2 emissions of the operation.

Specific and Prioritized Comments

Section or Topic	Page	Comment
I.	1	There is no outline for how feedback will be considered; no guidelines or criteria as of what is required for a comment to be considered or omitted or how it will inform future work. How will the comments be evaluated?
I.	2	It is not clear how TMC/NORI-D will ensure all necessary stakeholders are engaged, or how TMC/NORI-D would check this.
II. A.	2	How is NORI supported by TMC? It seems that NORI is made up of TMC members only, or are there differences between the two? Presenting select TMC members in the NORI section also supports the idea that there is no difference between NORI and TMC. Neither could this information be found on TMC's website, and specifically on the NORI project page. This clarification will be helpful in case major issues arise – who is responsible?
III. A	4	The referral to figure 3 should be figure 2
III. B	7	For a better overview it would be useful to include how nodules are created (precipitation of metals from out of the water around an organic nucleus) and that the process takes millions of years to grow a nodule. Please include.
III.B.	7	

		The statement about CCZ containing some of the lowest biomass on Earth can easily be misinterpreted here. First and foremost: the CCZ is understudied. NORI-D has released some high-level data during their final submitted EIS to the ISA (note that the approved EIS is not publicly available), but that is not detailed enough to determine whether biomass for all faunal groups follow this pattern. That is, most benthic and pelagic faunal groups were not analysed sufficiently to determine this. Second, Paulikas et al. (2020) do **not** describe or estimate biomass. Using search terms like 'biomass', 'weight', 'fauna' or 'CCZ' does not provide an indication to what biomass estimate reference 9 refers to here in Paulikas et al. Neither does Paulikas et al. (2020) estimate or determine that abyssal plains are common habitats. This use of reference is incorrect and should be replaced with something that supports the claims, and ideally the biomass claim. Further, one other issue with using Paulikas et al. (2020) is that it is funded by TMC, and thus would need support in any case from another reference that is not funded by proponents of deep-sea mining.
III.C.1	9	The wording is somewhat misleading here – in the original expedition planning TMC/NORI would have commenced with test mining before the approval, but because of winch failure the expedition was delayed, thereby obtaining approval first.
III.C.1	9	only successes are described here – why not what went wrong and lessons learned? For example, the discharge was less than planned, therefore the discharge plume was smaller than projected. How will this affect the outcome? These aspects also need to be considered.
III.C.2	10	The unknown location of the existing or "brownfield" port facility and production plant locations are an issue, as how is it guaranteed that this will not be in a country that may have labor-right issues, which is especially important as TMC regularly reminds the public that deep-sea mining avoids such issues. What steps are being taken to ensure that this is indeed true?
III.C.3	12	Same as the comment from page 10 – what parties in Asia are considered? How are labor-right protected and ensured?
III.D table 2	15	For completeness's sake, there should be factors considered here that are unique to the sea. It would be just as easy to create such a table focusing on just deep-sea mining impacts and ticking no for terrestrial mines in all the boxes. That would make terrestrial mines look good. For example, health, safety, and fatality risks at sea, affected fisheries, affected culture and values, conflict with other industries that use that area, migration routes of highly-migratory animals, multi-year presence of ships and ROV/AUVs (and noise), discharge of sediment plumes, oil spills, removal of fauna - it is not correct to focus on just flora -, restructuring of seafloor (for decades if not centuries), etc. As TMC (or any of the other contractors) have no connection to land-based mining operations, this operation is and needs to be considered as an additional impact on nature, regardless of whether there is impact on terrestrial nature from land-based mining projects. It is not going to mitigate terrestrial impacts. Further, I see here no considerations for potential indirect negative pressure on terrestrial nature via increased competition in ores. Additional resources will likely affect the prices of metals on the market, and that could result in an increased production on land as companies want to maintain their profits. Further, that could have potential repercussions for people working in land-based mines. Again, for completeness's sake, that ought to be considered. Last, there is no consideration here for land-based activities involved in the NORI-D operation. For example, where are the ships going to be built, where are the port and processing facilities? As long as this is not identified you cannot reliably claim that NORI-D ticks 'no' in any

		of those boxes. Thus, this exercise may provide no information at all regarding understanding social impacts of deep-sea mining – it is comparing apples with oranges.
III.D table 2	15	Based on details provided on pages 16 and 17, the statement about the number of arriving people seems untrue for NORI's 'no'. It is likely that such seagoing activities will especially attract foreigners as often knowledge of this type of work is not present in large numbers in one country. Join any ship and you will find multiple nationalities.
III.D table 2	15	Further, with regards to resettled/affected communities – should NORI decide to use facilities that have already displaced/affected communities, is that considered as no effect on NORI-D as it already occurred, or will the industry that NORI-D delivers be considered as upholding such issues? Same for co-location with local communities.
III.D	16	Nothing can be interpreted from statements like 'NORI is exploring'. Nothing is guaranteed and thus cannot be evaluated. This information needs to be available first before impact assessments can have any value.
III.D table 3	17	It does seem like this example was chosen as it has issues in its operation. Why not compare it to mines in Australia or Canada? Why not compare it against a mine that would uphold the same kind of regulatory standards as NORI-D is aiming for? That would give a better comparison.
III.D table 3	18	Table 3 misses discharge pipe in description for NORI-D.
III.D table 3	19	Table 3 - are no other wastes expected from processing the ores?
III.D table 3	19	Near-misses have occurred during the baselines expeditions – are these not considered for a complete understanding of health, safety and security? What is meant by security? There was an incident with a fire in the engine room on one of the expeditions and a muster was called. Does that require consideration?
III.D table 3	20	Based on the few datasets that are available from the CCZ, it indicates that there is a lot of heterogeneity in seafloor communities, so a statement like 'general common habitat' is not correct. There are lots of new species discovered, numbering in the 1000s at the moment (why are these not listed like for the Malagasy mine?). Based on the expeditions NORI-D has conducted, it is difficult to understand how NORI will 'identify and select' PRZs, at least, not based on informed decisions supported by data. The limited data that NORI provided for their final EIS submission to the ISA showed that even at low taxonomic resolution there are clear differences between the biological communities of the PRZ and IRZ, so that would suggest the preservation function of the PRZ is limited and may not include communities found in wider areas. Further, limited work has been done on connectivity, thus suggesting that the undisturbed nodules can function as stepping stones is not informed by data, and thus perhaps should not be listed here as it can hint at false promises. Last, it is pretty well established that the risk to biodiversity cannot be mitigated as it includes habitat removal. In that same line of thought, reducing the impacts also seems unlikely. This is further supported by the unique traits of deep-sea organisms (slow pace of life, low reproductive production) which means recovery will be slow, if at all possible. These results we have seen from small-scale disturbance experiments and impacts of deep-sea trawling.
III.D table 3	20	

		The APEI are not necessarily similar to NORI-D. It is up to NORI-D to show data to support that they are. Further, a statement like this requires an equivalent for the Malagasy mine. There are protected areas in Madagascar as well which may be more likely to be similar to the flora and fauna found at Ambatovy.
III.D table 3	20	This does lead me to state: more care ought to be taken to ensure that similar things are considered here. Equivalent factors are not included in the two comparisons, which can give the interpretation of cherry picking facts. This needs to be avoided, and thus I encourage you to take greater care in what is compared.
III.D table 3	20	GHG emissions: it is not just nickel that is collected though. It is not clear whether this includes all the support vessels and transport to processing facilities. It is not clear how these numbers are derived (what is the breakdown)?
III. D table 3	20	Another factor that ought to be considered are cumulative impacts.
III.E	21	For completeness's sake, there ought to be a statement that the royalties estimates are preliminary and by no means a guarantee. Where is the consideration of risks to the proposed endeavor? The payment regime of the ISA is not complete or established and until this is clearer, it is not clear how much money is left for TMC and what that means for the viability of the project. As per report (https://www.sec.gov/Archives/edgar/data/1798562/000121390021033645/fs42021a2ex96-1_sustainable.htm): 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.
III.E table 4	22	Table 4: this is perhaps disingenuous. As stated in the policy brief, the formula is a possible example for the distribution of revenue. As stated earlier, there is currently no payment regime established and possibly the ISA is not even close to establishing one any time soon – there continues to be much debate about this. This table seems to me to misrepresent the situation and possibly hint at false assumptions/outcomes.
III.E	22	Again, the statement about potential money gained is based on preliminary results. Stating how much tax may be paid therefore is not a fair representation of the situation. Much more language is necessary to highlight that these estimates are preliminary and by no means should be expected.
III.E	23	Alternative/new battery technologies are not considered, while this area is fast paced. This ought to be included in the scenarios: a combination of new battery technology, and recycling and switching to green technology.
III.E	24	As the study is not available for the public, it is difficult to assess whether the LCA has made the proper assumptions and considerations, and thereby calculations of GWP. At this point, again, we are supposed to just trust TMC/NORI without showing proof.

III.E	26	Even if deep-sea PMN nodules are collected, it is likely that land-based operations will continue, may expand or even create new operations. This is because NORI-D or TMC are not working with any terrestrial mining operation, and thus this operation will not offset land-based operations. Therefore, the idea that the start of deep-sea mining is reducing land-based impacts, in all its forms, is incorrect. Indirectly, the new competition this industry gives to terrestrial based operations could result in increased land-based pressures, and worsening of labor rights. The continued use of the argument that the NORI-D project is going to "solve" these issues is disingenuous. The only conclusion that can be made is that the start of this project will add to the total impacts on nature by human activities. Nothing is reduced, nothing is offset, there are only additional impacts on nature. The studies' highlights would have been useful if deep-sea mining would result in a reduction of land-based mining, which is not proven that it will, therefore the comparison is not useful. Further, it would be good to highlight that there is opposition to deep-sea mining as well, including by indigenous people from Pacific Island States for comparison.
III.E	27	Starting deep-sea mining will also result in biodiversity risk and biodiversity decline. The point of this statement is not clear – are you suggesting that the loss in biodiversity would be acceptable when it would result in the rapid delivery of battery metal supply?
III.E	27	Unique biodiversity from the deep sea is preserved by not mining. There is no possibility of avoiding biodiversity loss should mining commence. There is likely little opportunity for mitigation as habitat is removed as sediment plumes are generated. Reducing the risk of biodiversity loss is again unlikely. Natural recovery rates are not known, but there are some estimates: 10s to 100s of years, which ought to be included here (e.g., Jones et al. 2017). The operational EIS is unlikely to estimate this risk because the results will not be available before TMC/NORI intends to apply for a commercial license.
III.E	27	Stop giving percentage areas of the CCZ, this is disingenuous as NORI-D is not shown to be homogeneous, let alone the CCZ. This argument would not fly for suggesting that deforestation in some areas is ok. Everyone realizes that there are many different forest types; you would not consider cutting down part of the Amazonian rain forest because it represents a small percentage of the whole of the Amazonian rainforest or it represents a small percentage of all forest in the world. These comparisons represent a false narrative.
III.E	27	The results of the effects of partial nodule cover and no-take areas will not be available for several years. To include that analysis in an assessment as this would mean waiting for the results to be available. What does recovery mean here? Nodule-dependent species will reduce in abundance with the risk that small populations face, as the nodules will be removed and these will not come back for millions of years.
III.E	28	What determines the success of NORI's training and internship opportunities? Just stating that they occurred may not be enough to determine there has been a benefit.
IV.A	29	A section dedicated to land mining is not pertinent in this document, which should be limited to its purpose (a scoping report for a particular deep sea mining activity). There is no reason to assume that the proposed activity (extracting polymetallic nodules from the NORI contract area at the CCZ) will have any effect in any other mining activities. Therefore, this section is out of scope and must be eliminated.

IV.B	29	The impacts of deep-sea mining, should bet listed and are: habitat removal of which restoration is unlikely, sediment removal, sediment compaction, sediment redistribution, increased sediment deposition, sediment plumes, metal-laden sediments in the environment, biomass removal, smothering of animals, clogging of filtering apparatuses and gills, decreased quality of visual environment, light pollution, noise pollution, and that is for the seafloor. The release of the discharge plume also includes the sediment, light and noise pollution. It is also worth to state that these impacts are not limited to the area that is directly mined. Thus, the footprint of mining is significantly larger.
IV.B	30	Note that the pilot trial will provide limited information, and especially for the pelagic impacts as the discharge plume generation was not as successful and impacts on metazoans were not investigated.
IV.B	30	What is the 90% estimate based on? How is this estimated? I assume this occurs in the collector vehicle, but again, how?
IV.B	30	Note that there is a decrease in pH measured in the discharge plume – thus increased acidification.
IV.B	30	What models show this? And is this based on data collected from the collector test? As that does not represent a commercial discharge plume. That seems to underrepresented the spatial scale.
IV.B	30	This focus on the removal of plants is not a fair comparison. Focus on the removal of animals instead.
IV.C	30	Building a processing plant will bring certain land-based impacts – however the impacts do not or seem to be very minimally described in the report?
IV.C	31	‘as will be detailed in TMC and/or NORI’s policies and commitments’ – a promise that cannot be checked or verified for guarantees.
IV.D	31	It is unclear how CSIRO will be able to develop an EMMP for NORI-D as the data from the baseline studies and collector test will be available too late for the timeline set by TMC/NORI. That is, CSIRO has stated they need 2 years, while TMC/NORI have indicated to submit their application for a commercial license in the second half of this year (2023), most likely July. However, is the EMMP needed for this application? The timelines for the various components of the application (this SIA, the EMMP, the data analyses, the EIS) seem unaligned and rushed, all in order for TMC/NORI to make their self-imposed deadline. What is the purpose of this, and how will Prizma ensure quality of this SIA given these pressures and limited data availability?
IV.D	31	There are currently no established environmental impact thresholds established. Is TMC/NORI here assuming they will set the thresholds? Based on what? How is this ‘digital twin’ going to work in this case? For suspended sediments alone, the thresholds may be low (van der Grient & Drazen 2022).
IV.D	31	What is ‘up to a percentage’? This is a statement that cannot be evaluated. Further, there has not been any data shown that these nodules can act as stepping stones. Further, several impacts, such as noise, light and suspended sediments (and deposition) can still impact those stepping stones, so how are these really going to be functioning as stepping stones and maintaining connectivity?

IV.D	31	NORI should not worry about the size of the CCZ, and instead focus on their area. Of course NORI-D is going to be smaller than the CCZ. TMC/NORI ought to show that the biological communities present in NORI-D are similar to APEI and that there is connectivity between NORI-D and the APEI should they wish to continue to use this argument.
IV.D	32	There are no studies investigating the recovery or resilience of pelagic communities in the CCZ, so where is this statement of years to decades based on? The recovery of seafloor communities is more likely to take decades to centuries. There is also no uncertainty around the recovery of fauna that requires the nodules as habitat – they will not recover without the hard substrate. This is limited by the amount of hard substrate, so removing that will not result in complete recovery, it will at most result in partial recovery related to what is left behind.
IV.E	33	Based on the limited data provided by TMC/NORI in their final submitted version of the collector test EIS, it indicates that the IRZ and PRZ are not similar in biological communities, and thus that limits the identification of and differentiation between natural variability and mining impacts. So far, TMC/NORI have not addressed this. How can the EMMP be submitted with the application for an exploitation license when CSIRO already indicated in talks that they won't be finished by then? What kind of EMMP will be submitted?
V.B	34	Given that this is the basis for the SIA, why is access to renewable energy sources as a search criterion not considered in the SIA, but in a different report? That is a social aspect.
V.B	34	According to a recent report published by the Guardian, it seems that carbon credits are 'empty promises' and do not result in offsetting. Perhaps TMC/NORI should consider alternatives to carbon credits rather than jump on this debunked train.
V.B	34	'With project' also does not equal elimination of social (and other types of) risks, and can be expected to be shifted to other projects/operations elsewhere. This statement seems not to consider the scenario that competition of deep-sea mining can result in new and additional mining projects on land to offset loss of income as a result of the new competition.
V.C	34	Counterfactual is a strange choice of words here – it means: relating to or expressing what has not happened or is not the case? What kind of scenario is that?
V.C table 5	35	Table 5. Socio-economic impacts: The values in the 'with' project column are based on preliminary information and subject to change, but nowhere is this information given. For clarity, that ought to be included. It is unclear how this project will develop and expand the ISA? No negative impacts on fishing or cultural values listed. No considerations of the onshore-based part of the mining process considered with the negative effects here. Instead, the focus is solely on the positives. That is not a fair comparison. There may be a typo in this cell as well – 'economic benefits to be *distrusted* equitably'? what distribution meant? 'no project': no positive economic ripple effect for who? The previous part of the report clearly tries to make a statement that the number of jobs created by deep-sea mining is limited. Or is this referring to tax or royalties lost? The benefits that are going to be distributed equitably; given the number of nations that are part of the ISA, that value won't be very high. Instead, it may be

		beneficial economically only to a small minority. Further, what capacity building will be missed out on? There will be no delay in deep-sea research as this is part of the exploration license, not exploitation license application. This is an inaccurate statement. One positive is missed: the preservation of pristine environments is ensured (that is, no additional negative environmental impacts). The 'counterfactual column' shows several misleading and incorrect statements. There will most likely be expansion of existing or developing of new mining projects regardless of the NORI-D project, and the addition of Indonesia seems a little scaremongering. This statement ought to be removed. Likewise, DSM within national jurisdiction will be developed or not regardless of the NORI-D project. This can also be removed. DLBPS will continue to be subject to global market forces even if the NORI-D project would start, thus this is a false statement. The compensation they may obtain from the NORI-D project may not be comparable to the loss in metal prices that could occur when NORI-D puts new resources on the market (potentially driving the price down). Thus this is also an inaccurate statement. The counterfactual does not consider alternative and new battery technology, or recycling. Instead, the focus on Russia seems a little scaremongering.
V.C table 5	35	Livelihoods: 'With project' does not consider the connections that cultures such as Pacific Islanders have. Instead, these are dismissed which seems like a form of disrespect to them, just because they are not physically close to the site. As onshore impacts are not determined yet because of locations, this does not allow for comparison. Why is this done like this? Why should the whole of the Pacific Ocean be considered? This is not done for land-based mining projects. Or are these to be considered as several species are highly migratory and thus can transfer effects to other areas? 'counterfactual scenario' again, this statement is not correct as it can still happen if NORI-D went ahead. The inclusion of this seems to scaremonger. There are many mines that are not using child labour. The presentation as it seems to suggest that this does occur everywhere which is false. Shortages may also increase prices for metals, what are the impacts of that?
V.C table 5	36	Health & Safety: 'with project': as the onshore facilities are not identified, there could still be a risk of child labour. This statement is thus false. What is considered as no lost incidents? As the collector test was delayed because of a broken winch. That impacted people in their work. 'Counterfactual scenario' new and expanding projects can still occur even if the NORI-D project started. The exploitation of NORI-D has no influence over this, and it is disingenuous to present it as if NORI-D has this power.
V.C table 5	36	Marine scientific knowledge: 'With project' – while this claim that scientists are free to publish is probably true, it does seem interesting that these scientists do not want to talk about operations on the ship or proceedings of the collaboration. So stating this freedom does seem a little disingenuous.
V.C table 5	36	Capacity building:

		'With project' what are the criteria for success for capacity building? How is it determined that SIDS particularly highly value the training? And is presence on a ship enough to call it capacity building?
VI.A.	40	ISA is developing an international regulatory regime in coordination with the emergence of a new industry.
VI.A	40	It was not the presence of deep-sea minerals that drove the establishment of UNCLOS, but a concern that any benefits from resource exploitation would be concentrated with advanced economies and not benefit all of humankind.
VI.A	41	Box 1: The common heritage of humankind principle insists that seabed resources be used in the interest of humankind, not exploited under a regime for the benefit of humankind. The second paragraph is closer to an accurate statement of the principle, but the first paragraph is misleading.
VI. B	42	Clarify the procedures or thresholds for Assembly approval of rules, regulations, and procedures after Council adoption. Describe the Council's process for establishing environmental standards and role with regard to evaluation of environmental impact assessments and monitoring and enforcement.
VI. B	43	Describe procedures for the selection of LTC members, describe process and criteria for the review of application and opportunities for public comment and scientific review.
VI.E	46	In addition to the inclusion of SIDS representatives on the LTC, describe other areas of necessary scientific expertise and a transparency process for selection of these members
V.F	46	The expansion of APEI areas is a red herring and fails to address questions of ecological damage or social impacts from mining activities in NORI contract areas.
V.G	46	Describe processes for evaluation to ensure that sponsoring member states maintain "effective supervision and regulatory control over" sponsored contractors.
V.H	47	False claims to transparency or serious public stakeholder engagement: "Draft exploitation regulations have been prepared following a multi-year, transparent process, and involving public consultation." Describe any processes or procedures for "taking into account stakeholder input."
VI.J	50	PS 5 – it is not a given or proven by NORI that the onshore processing of nodules will not result in land acquisition and involuntary resettlement. NORI claims both that they will use existing facilities as well as build their own, depending on where you look on their website and in this report. As this has not been determined yet, this report cannot exclude this PS 5 as there is no guarantee that it will not cause this. Further, existing facilities that NORI may use may have already caused this – would NORI consider this? Would NORI be implicit in the land acquisition

		as their work will maintain that status quo or will it conveniently not be NORI's problem as it was down before them working there?
VI.J	50	PS 7 as outlined in the report, Indigenous peoples of Pacific Islands have intrinsic relationships that transcend the distance NORI is from land. By taking this approach – only worrying about a physical distance – these people are disregarded. A conventional approach is not applicable here. Also, for the sake of balance, list the Pacific Island Nations that are against DSM beside the two that are in support of it.
VI.J	50	PS 8 – again, it does not feel right to use a common, land-based approach here. It sets the wrong precedent, and it disregards Indigenous peoples. Listening to Pacific Island Nations, it seems that DSM would affect cultural heritage, knowledge and practices.
VI.J	50	Further, it seems strange that the Common Heritage of Humankind is here only considered via the economic benefit – as if DSM will only result in economic benefits (for all) which is a limited take. The costs need to be equally considered. Future generations may not want this to occur. The youth may not want this to occur. This take here presented is way too narrow. Also, see comments on Box 1, p. 41.
VI.J	51	The location of the project's nodule collection area on Clarion Island does not address potential indirect social impacts on Indigenous People or their territories or impacts from land-based processing facilities and operations.
VII. table 9	55	Table 9 – why are other industries not included, such as deep-sea cables, shipping transport, fisheries?
VII. table 9	55	Traditional knowledge and cultural values from Pacific Islanders can be affected, but these are not included. They should be considered separately, and not be pushed into a box where Nations present at the ISA should deal with their concerns. You yourself already note that indigenous communities are not always considered or well represented, so there is an opportunity here to do better.
VII. table 9	55	Youth voices are not considered in this table. Common heritage is for everyone, including those after us, and someone ought to speak for them too.
VIII.A	56	Describe if stakeholder comments will be made public along with the summary of comments and NORI response.
VIII. A	57	With regard to 7, will all public comments and responses be made publicly available to member states, observers and other stakeholders? Also, who are the other stakeholders? Is there a plan for outreach or education on the SIA Scoping and TOR?
VIII.B	57	Is there any third party involvement in the summary of stakeholders' key concerns and comments?
VIII. C	58	The only social issue identified at NORI's San Diego global stakeholder consultation involved job losses for land-based mines? None of the subsequent concerns about social impacts expressed in written comments were raised? Also, can you cite the EIA review document that affirmed EIS methodologies and processes?

VIII. C	59	Describe or link to the updated monitoring plan. University of the sunshine state? Or University of the Sunshine coast?
VIII. D	60	In addition to a grievance management process, will there be a monitoring and reporting process for stakeholders and the public? Can you provide a description?
IX.	63	As this concerns mining in the deep sea, it seems odd to me that the tests regarding social changes, processes and other impacts are all based on land-based mining. That is comparing apples with oranges, we are dealing with a completely different industry here.
IX.A (second one)	63	Also, the common heritage of humankind should be given more consideration than is given here. It should not be 'may require a broader perspective' – it does require a broader perspective. This is a new industry, the old tests for a different system do not translate and thus this requires extra care.
IX. B	63	Again a sentence 'either NORI will construct or work with existing facilities onshore'. As this is not known, how can the social risks be considered? What if the general size and nature of the workforce cannot be characterized as these decisions have not been made by NORI? What does that mean for this SIA? How can we assess whether this scoping report considers all relevant aspects when the plan and data are not available to be presented?
IX.B (second one)	64	How are you assessing socio-economic impacts from the collector test in the SIA when the data for this may not be available in the timeline set out for the SIA?
IX.B (second one)	64	ISA contractor observations are not the best data available to determine whether fishing occurs in the CCZ. First, these data are not presented here. How often did they see ships? Was this noted down? Over what time period did NORI look? Second, there are better data out to determine this, like from the Regional Fisheries Management Organizations and the United Nations Food and Agriculture Organization, both have data that show fishing does occur. In addition, the first estimates of the overlap between the industries have already been done (https://doi.org/10.1016/j.marpol.2021.104564).
IX.C	64	How can NORI test suspended sediment plume effects in the midwater when no data were collected on metazoan such as zooplankton, micronekton and gelatinous communities, for which environmental baseline data were collected? And since these data are absent, it is impossible for NORI to determine the socio-economic effects of midwater sediment plumes.
IX.C	64	The collector test will not give you information regarding the impacts to fisheries as the required data were not collected. This claim can therefore not be included in the SIA. Further, the discharge duration of the midwater plume of the collector test was so short it will not give you reliable information to inform fisheries impacts from commercial licenses. The concentration of the generated midwater plume was lower than planned because of issues with material and therefore is also not reliable or informative to make any conclusions regarding fisheries impacts.
IX.C	65	No statements can be made that the loss of climate regulation services are balanced out with positive effects from the project. It is well known that the creation of green technology still requires a lot of fossil fuel. It sounds like from building the ships (Netherlands) to collection to transport to land (Mexico) to transport to facilities (India) means crossing the whole world and I

		have not seen evidence presented that this has been consi for nodule operations, nor how this offsets the loss in cli the data required to estimate climate regulation would include the active carbon export pump, for which no data have been collected during the collector test, so again, this is a false statement.
IX.	65	The loss to Pacific Island cultures is not considered, nor is the loss of the common heritage of humankinds for future generations considered. To state that there are only benefits to humankind is an overstatement – given the opposition of many people, organizations and countries, there are clear expected negative impacts which are measured in perhaps other things than just monetary values. None of these are considered here.
IX.	65	No mining zones do not mitigate the impacts in mining zones as all mining in the deep sea are additional impacts on the ocean. Nothing is offset here, and connectivity is not known. A statement like this for protected areas is not supported. Further, it requires that the protected areas are similar in communities as the mining areas – which is not supported by the few data NORI has presented in their collector test EIS.
Table 12	68	Unclear how VSC baselines will be established and monitored over time.
IX.G	69	Besides illegal fishing operations, you can consider legal fishing operations.

* Type of stakeholder may include International and State Actors, Companies, Interest Groups, Communities, Individuals or Other (please specify)

NORI
NAURU OCEAN RESOURCES INC.

PRIZMA

SCOPING DOCUMENT FOR A SOCIAL IMPACT ASSESESSMENT FOR THE NORI-D POLYMETALLIC NODULE COLLECTION PROJECT

Prepared for Nauru Ocean Resources Inc. by Prizma LLC
Effective Date: September 6, 2022
Draft Version: December 12, 2022

Disclaimer: This report was prepared exclusively for Nauru Ocean Resources Inc. (NORI) by Prizma LLC (Prizma). The quality of information, conclusions, and estimates contained herein are consistent with the level of effort involved in Prizma's services and based on: a) information available at the time of preparation, b) data supplied by outside sources, and c) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by the above client subject to the terms and conditions of its contract with Prizma. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

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List of Abbreviations

AfDB	African Development Bank
ABNJ	Areas Beyond National Jurisdiction
APEI	Areas of Particular Environmental Interest
Area	Areas Beyond National Jurisdiction
BGR	Germany's Federal Institute for Geosciences and Natural Resources
CAPEX	Capital Expenditure
CCZ	Clarion Clipperton Zone
CHH	Common Heritage of Humankind
CE	Cumulative effects
DLBPS	Developing Land-Based Producer States
DSM	Deep-sea mining
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ESG	Environmental, social and governance
ESIA	Environmental and Social Impact Assessment
FPIC	Free, Prior, and Informed Consent
GHG	Greenhouse gas emissions
GIIP	Good International Industry Practice
GSR	Global Sea Mineral Resources
GWP	Global Warming Potential
IEA	International Energy Agency
IFC	International Finance Corporation
IMO	International Maritime Organisation
ISA	International Seabed Authority
kg	Kilogram
ktpa	Kilotonnes (metric) per annum
LBM	Land-based mining
LTIFR	Lost time injury frequency rate
m^2	Square meter
Mtpa	Million tonnes (metric) per annum
MARPOL	International Convention for the Prevention of Pollution from Ships

Nauru	Republic of Nauru
NORI	Nauru Ocean Resources Incorporated
NORI-D	Nauru Ocean Resources Inc Contract Area D
NSMA	Nauru Seabed Minerals Authority
OECD	Organisation for Economic Co-operation and Development
OEMMR	Office of Environmental Management and Mineral Resources
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PCDP	Public consultation and disclosure plan (Stakeholder Engagement Plan)
Prizma	Prizma LLC (Limited Liability Company)
PRZ	Preservation reference zones
PS	IFC Performance Standards
PSIDS	Pacific Small Island Developing States
REMP	Regional environmental management plan
RKEF	Rotary Kiln-Electric Furnace
SDG	Sustainable Development Goals
SIA	Social Impact Assessment
SIDS	Small Island Developing States
TCFD	Task Force for Climate-related Financial Disclosure
TMC	The Metals Company
TOR	Terms of Reference
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNSDG	UN Sustainable Development Goals
VC	Valued component

I. About this Document

The purpose of this Scoping Document is threefold:

1. Inform stakeholders about the planned NORI-D Polymetallic Nodule Collection Project (the Project).
2. Solicit stakeholders' input in designing the Terms of Reference (TOR) for the Project's planned Social Impact Assessment (SIA) study.
3. Demonstrate that the Project has engaged with stakeholders to consider and incorporate their perceptions, expectations, and concerns into the Project's SIA process.

The Project is applying a conventional and phased social impact assessment process. A simplified concept diagram of the process for the ***SIA Scoping*** *phase* is depicted below. This document is drafted to support the SIA *Scoping* phase as depicted in Figure 1.

Figure 1: Conceptual SIA Scoping process used for the NORI-D Project

Source: Prizma, SIA - Social Impact Assessment, TOR – Terms of Reference

Scoping is the process of identifying and prioritizing the key areas of focus which will need to be investigated in a subsequent impact assessment[1]. Scoping helps focus impact assessments on the potentially significant positive and/or negative effects that should be considered by the decision maker when determining whether or not to approve a project, and in determining what conditions to apply to any approval.

This Scoping document is expected to be published in December 2022. A series of virtual and in-person engagements and consultation activities are being planned and will be announced. Readers are invited to submit their comments online at https://norisiascoping.paperform.co/ or https://metals.co/nori/. Alternately, a template is provided in Annex 2 which can be emailed as an attachment to stakeholders@nori.nr. For ongoing updates about the NORI-D project, readers are encouraged to visit NORI's website and social media[2], and subscribe to newsletters here: https://metals.us18.list-manage.com/subscribe?u=c025d3ca0d7fa4ca16d015990&id=4e5cf6ab35.

Following the close of the scoping consultation period, feedback will be considered to inform the TOR for the subsequent SIA that will be undertaken by Prizma. The summary Record of Scoping and the TOR will be produced and published.

[1] IAIA, 2018. Fastips on Scoping, No 18, November 2018

[2] https://www.facebook.com/NauruOceanResources/ https://twitter.com/nori_nauru?lang=en

The SIA will also be subject to public consultation. The outcome of the SIA will be integrated into an EIS, which is required by the ISA as part of NORI's exploitation application for the Project.

As outlined in ISA's Template Table of Contents for an EIS, the Project's planned SIA will describe the obligation, goals, nature, methods, extent and outcome of disclosure and consultation activities with interested and potentially affected stakeholders. A summary of the stakeholders' key concerns and comments, and how these will be addressed, will also be provided. In addition, plans for continuation of the consultation process will be outlined.

NORI plans to submit its application for an exploitation contract for the NORI-D Project in H2 2023. This will also require the submission of an EIS to the ISA for approval. This will include the key findings of the SIA.

This document was generated by Prizma LLC (Prizma)[3] on behalf of Nauru Ocean Resources Incorporated (NORI[4]), a wholly owned subsidiary of The Metals Company (TMC[5]).

II. NORI & The Metals Company

A. NORI

NORI, which is developing the NORI-D Project, is a company registered in and sponsored by the Republic of Nauru, an island state. NORI was established in 2010 and is wholly owned by TMC. NORI is supported by TMC's experienced team of executives, senior management, and members of its board of directors.

Selected TMC team members are introduced below.

- **Mr. Grant Lindner** serves as Project Director for NORI-D. He brings extensive experience in delivering complex resource projects in the construction and mining industries and has delivered over $26 billion in project value during his 25-year career at leading engineering and construction group, Bechtel, and mining major, BHP. He has held senior executive roles for large-scale mining, smelter and refinery, material handling and marine projects, and has a record of building high-performing teams to ensure efficient project delivery.
- **Dr. Gregory Stone** serves as the Chief Ocean Scientist. He has authored hundreds of publications including in Nature and National Geographic, and published four books. Dr. Stone's accolades and professional associations include the Explorers Club, Pew Fellowship for Marine Conservation, National Geographic Hero, the US National Science Foundation/Navy Antarctic Service medal. From 2008 to 2018, he served as Chief Scientist for Conservation International and head of the Global Ocean Program.
- **Ms. Erica Ocampo** serves as Chief Sustainability Officer. Previously, she led the development of company-wide sustainability strategy at Sims Limited, a global leader in metal recycling and electronics recovery, and spearheaded sustainability projects across various business units at

[3] https://prizmasolutions.com/
[4] https://metals.co/nori
[5] https://metals.co/

DOW with focus on circular economy, climate change; and ESG standards, performance metrics, and reporting.

- **Dr. Michael Clarke** serves as Environmental Program Manager with over 25 years of experience in the field of environmental management and impact assessment. He is a certified Environmental Practitioner and Environmental Impact Assessor, and successfully delivered complex EIAs for large infrastructure projects around the world. As a marine biologist, he has also been involved in marine conservation programs and baseline studies in Egypt, Indonesia, Vanuatu, and Australia.
- **Mr. Corey McLachlan** serves as Head of Stakeholder Engagement. He is an experienced community and social performance manager with experience in South Pacific and the Canadian North. Mr. McLachlan started his career in government before joining Rio Tinto, leading their community relations team at the Diavik Diamond.
- **Mr. Jon Machin** is Head of Offshore Development and has 30 years of experience at the forefront of subsea engineering and technology, including in the deep-water sector. His experience includes designing and building remotely operated vehicles engaged in trenching for pipelines and cable laying, and deep-water dredgers. He holds numerous patents, published over 20 peer reviewed papers, and lectured widely on deep-water engineering.
- **Dr. Jeffrey Donald** is Head of Onshore Development with over 20 years of experience in mining and metallurgical business. This includes complex greenfield development, major expansions, environmental improvement and compliance, and commercialization of novel technologies. Previously, he worked with Hatch, INCO, Vale, and SNC Lavalin.

B. The Metals Company

TMC is a deep-sea minerals exploration company focused on the future collection, processing, and refining of polymetallic nodules (PMN) found on the seafloor in international waters of the Clarion Clipperton Zone (CCZ) in the Pacific Ocean. The company's common shares and public warrants are trading on the Nasdaq Global Select Market (Nasdaq) under the symbols "TMC" and "TMCWW". TMC holds exclusive exploration and commercial rights to three polymetallic nodule contract areas in the CCZ through its subsidiaries NORI and Tonga Offshore Mining Limited (TOML), sponsored by Nauru and the Kingdom of Tonga (Tonga, and island state), respectively, and exclusive commercial rights through TMC's subsidiary, DeepGreen Engineering Pte. Ltd.'s (DGE) contract with Marawa Research and Exploration Limited (Marawa), a company owned and sponsored by the Republic of Kiribati (Kiribati, also an island state). Additional information about TMC can be accessed here: https://metals.co/

III. Project Description

A. General Project Location

NORI plans to collect (also referred to as "mining," "exploitation" or "harvesting") polymetallic nodules (PMN) from the abyssal plains (seafloor at over 4,000 meters depth) within the Clarion Clipperton Zone (CCZ). These nodules are discrete rocks that sit unattached to the seafloor, occurring in significant quantities in the CCZ, and containing high concentrations of nickel, manganese, cobalt, and copper in a single rock.

The CCZ is located between Hawaii and Mexico in the Pacific Ocean – it is a geological submarine fracture zone of abyssal plains and other formations. The CCZ has a length of around 7,240 km and spans approximately 4,500,000 km^2. This means that the CCZ is approximately as wide as the continental United States, and its area represents approximately 1.2 percent of the global seafloor.

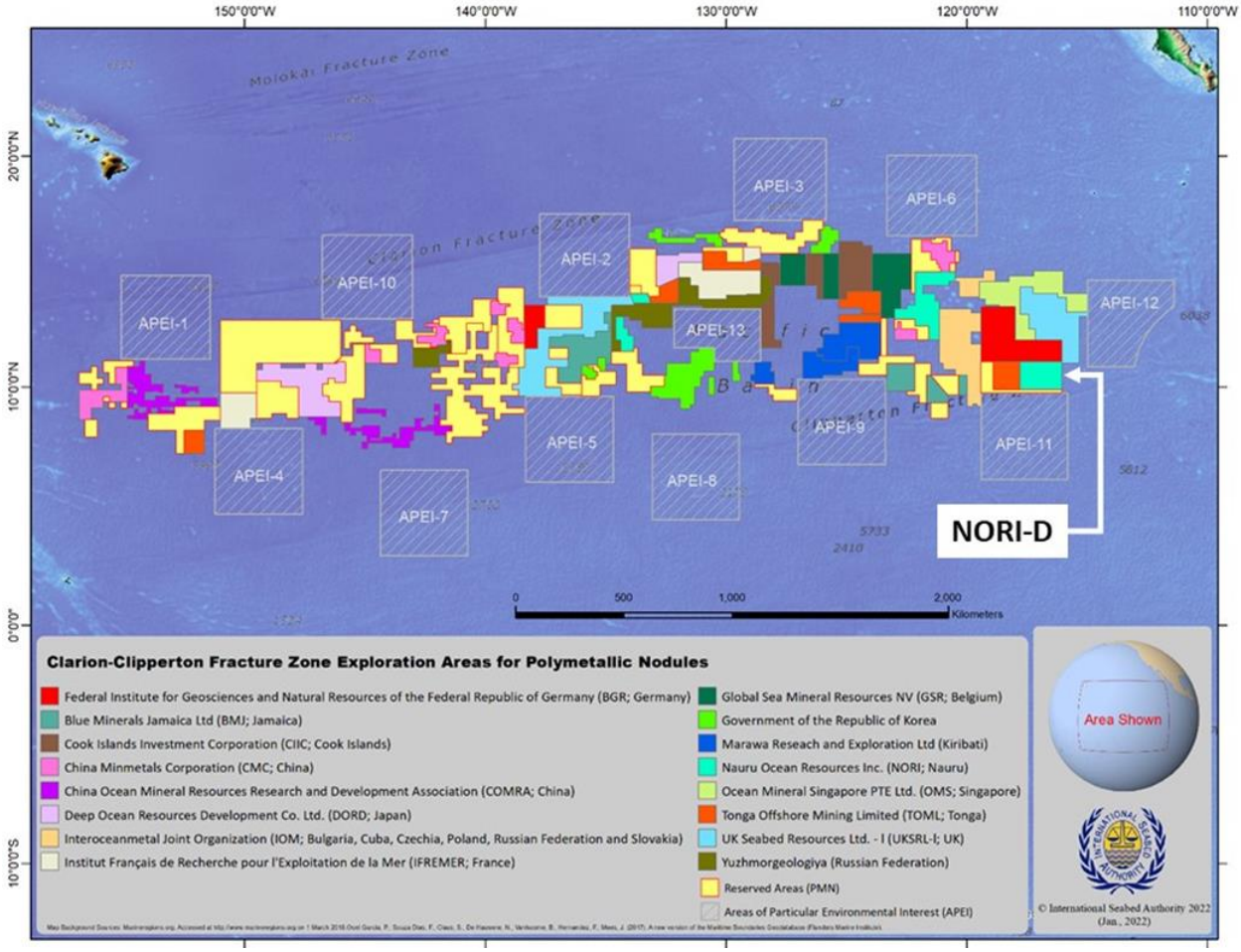
The CCZ features numerous exploration blocks, which are depicted in Figure 3. Other features include "Reserved Areas" (colored in yellow), which are available exclusively for developing countries. The map also identifies a series of protected areas designated "Areas of Particular Environmental Interests" (APEIs). These are intended to protect representative seafloor areas[6], are closed to mining, and intended to safeguard seafloor biodiversity and ecosystem functions across the region.

By December 2021, a total of 13 APEIs were designated pursuant to the ISA's Regional Environmental Management Plan for the CCZ[7], representing 1.97 million km^2 of protected seabed. This means that approximately 43% of the CCZ is protected.

The nearest protected area outside of the CCZ is Clarion Island, located at a distance of approximately 700 km from the NORI-D Project. The island is part of Mexico's *Archipiélago de Revillagigedo*, a designated UNESCO World Heritage Site[8]. It includes four islands, features two naval bases, but is otherwise uninhabited.

[6] https://isa.org.jm/node/20452
[7] https://www.isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone (accessed 4/19/2022)
[8] https://whc.unesco.org/en/list/1510/

Figure 2: Exploration blocks, reserved and 'no mining' (APEI) areas in the CCZ



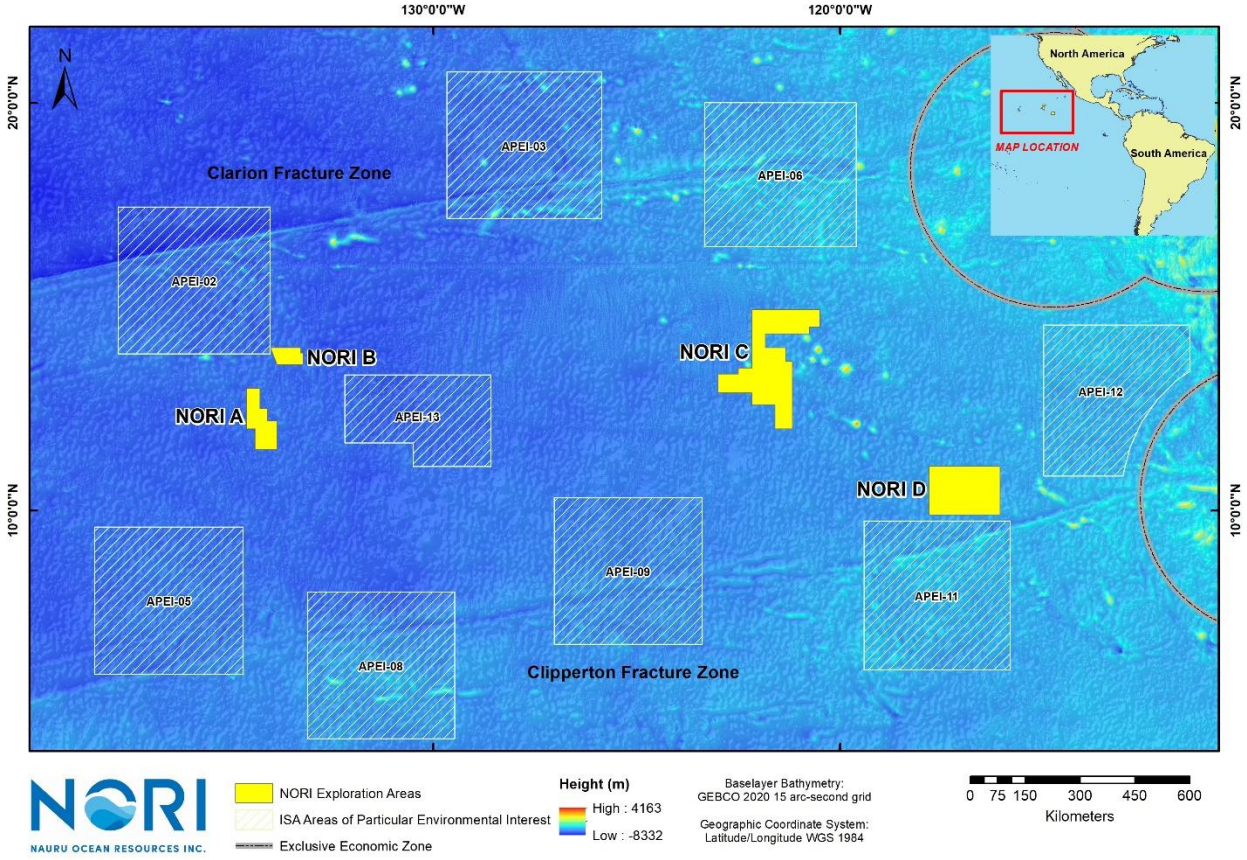
Source: ISA at https://www.isa.org.jm/index.php/map/nauru-ocean-resources-inc (accessed 26/3/2022). APEI - Areas of Particular Environmental Interest represent 1.97 million km^2 of protected seafloor set aside by the ISA pursuant to regional environmental management plans.

B. The NORI-D Project

In July 2011, NORI was granted a 15-year PMN exploration contract by the International Seabed Authority (ISA), which is described further in the regulatory section of this Scoping Document. NORI's contract areas within the CCZ – including the NORI-D Project– are identified in Figure 3.

In 2022, the NORI contract area was ranked by Mining.com as having the world's largest undeveloped nickel resource. The NORI-D Project involves a long-life PMN collection development. NORI-D is expected to be the first project to apply to commercially collect deep-sea polymetallic nodules in international waters which is subject to ISA's regulatory regime, and that of NORI's sponsoring State, Nauru.

Figure 3: Location of NORI's contract areas (yellow) and APEIs (shaded) within the CCZ



Source: NORI using shape files from ISA, APEI – Areas of Particular Environmental Interest

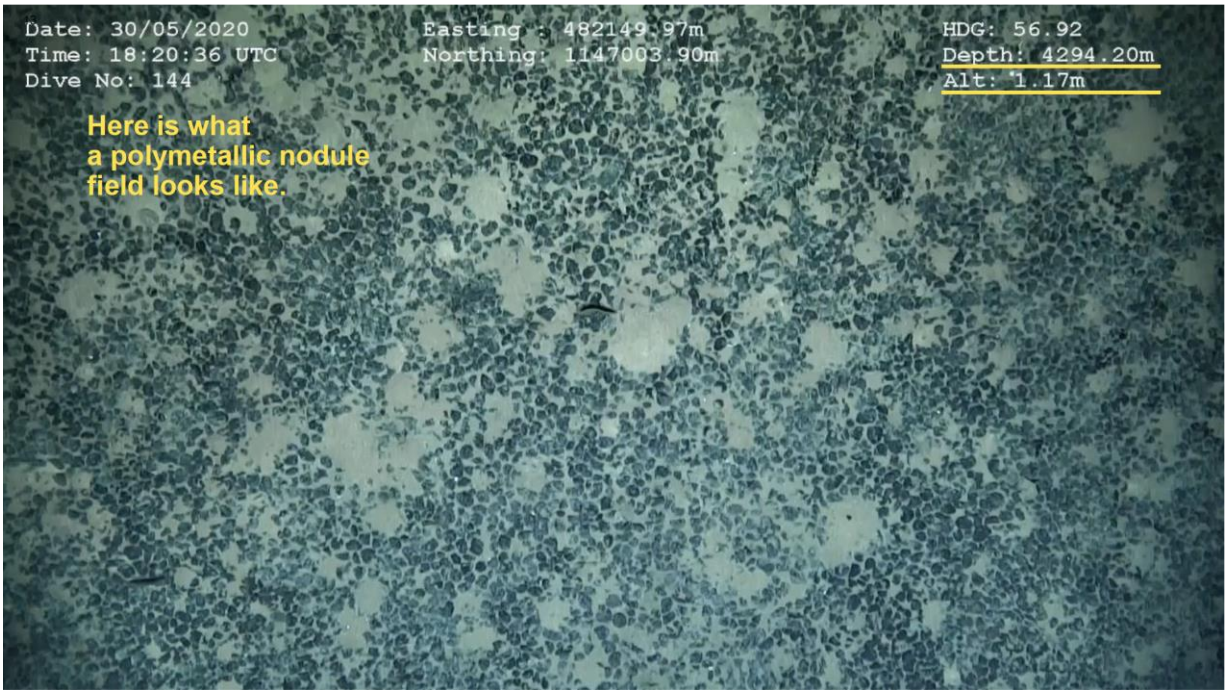
Table 1: NORI 2020 Mineral Resource estimate for NORI-D at 4 kg/m^2 abundance cut-off

Resource Category	Tonnes (Mt, wet)	Abundance (wet kg/m^2)	Nickel (%)	Copper (%)	Cobalt (%)	Manganese (%)	Silicon (%)
Measured	4	18.6	1.42	1.16	0.13	32.2	5.13
Indicated	341	17.1	1.40	1.14	0.14	31.2	5.46
Measured + Indicated	345	17.1	1.40	0.14	0.14	31.2	5.46
Inferred	11	15.6	1.38	0.12	0.12	31.0	5.50

Source: AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clipperton Zone, Deep Green Metals Inc., March 2021. Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis. Moisture content estimated at 24% w/w. Estimates presented on an undiluted basis without adjustment for resource recovery.

The resource estimate for NORI-D is presented in Image 1 below. The high-grade polymetallic nodules contain nickel, cobalt, copper and manganese, metals commonly used for Li-ion battery cathodes as well as other uses, such as electric wiring and steel making. The typically oblate nodules, ranging on average from 3-4 cm, are distributed, unattached on the generally muddy seafloor of the abyssal plain at a depth of over 4,000 meters below sea level within the CCZ in the Pacific Ocean (see Image 1). The CCZ abyssal plains are common habitats, which feature some of the lowest biomass on earth[9].

Image 1: Polymetallic nodules, on average 3-4 cm in size, laying unattached on the seafloor of the abyssal planes at over 4,000 meters depths



[9] Paulikas, D. et. al., (2020). Where should Metals for the Green Transition Come From? https://metals.co/download/237815/?tmstv=1668033071 page 110-112

Source: TMC

C. Phased Development

NORI proposes to implement the project in phases which allows for the ramp-up of nodule collection capacity as information is collected in the field and confidence in the technical and environmental performance of the system improves over time. This 'Adaptive Management' approach to the implementation of the commercial phase of nodule collection is considered best practice for a nascent industry with a relatively short history[10]. Phased development coupled with an adaptive approach to environmental management will provide learnings at small-scale which will be applied to support increases in scale of the development.

The NORI-D Project involves the following inter-related phased developments, as summarized further below:

1. Collector Test (sea trials completed)
2. Project Zero
3. Project One

The Project description used for this SIA Document, the SIA study, and subject to ISA approval, includes Project Zero and Project One, described further below. For additional context, outcomes of the Collector Test (expected to be completed in Q4/2022) are also summarized below.

1. Collector Test

Following ISA recommendation to commence testing, NORI and offshore partner Allseas commenced the Collector Test in September 2022. Following initial pilot system commissioning tests, a dedicated team of 130 crew and engineers aboard the Hidden Gem conducted a series of production runs in the NORI-D test area. Driving the pilot nodule collector over 80 kilometers, Allseas engineers put the system through a series of tests achieving a sustained production rate of 86.4 tonnes per hour. Approximately 4,500 tonnes of PMN were collected during the test, of which over 3,000 tonnes were transported to the surface production vessel, Hidden Gem, while the additional 1,500 tonnes of nodules were purposely left behind on the seafloor as part of the trials. The pilot system is expected to be scaled up to include additional collector heads and a wider diameter riser pipe in preparation for NORI's Project Zero.

Concurrently, aboard a dedicated monitoring vessel, marine experts and academic scientists conducted the first monitoring program of an integrated pilot collector system test. Remotely Operated Vehicles (ROVs) and Autonomous Underwater Vehicles (AUVs) were used to survey, monitor and sample the sediment plumes generated by collector operations on the seafloor as well as the mid-water discharge of water from the riser system used to transport nodules from seafloor to the Hidden Gem. Over 40 subsea sensors on seafloor landers and mid-water moorings were deployed to continually monitor sediment plumes and noise generated by the nodule collection operations. The ongoing monitoring program will continue to survey environmental impacts and collect scientific data after the conclusion of the collector system test.

[10] https://www.sciencedirect.com/science/article/abs/pii/S0959652622001305

A short video showing selected elements of the collector test can be accessed here: https://www.globenewswire.com/NewsRoom/AttachmentNg/453aa06e-2539-4e43-a8f9-36c837e78cd0.

The Environmental Impact Statement and Environmental Management and Monitoring Plan, as well as related stakeholder comments received for the Collector Test can be accessed at https://www.metals.co/nori.

2. Project Zero

The pilot collector system (as described in the NORI-D EIS (NORI, 2022)) will be upgraded into a first commercial production system and commissioned for commercial operation in the NORI-D contract area. This first phase of the NORI-D commercial development is referred to as Project Zero.

On March 16, 2022 NORI and Allseas entered into a non-binding term sheet for the development and operation of a commercial nodule collection system. The plans envision the pilot system to be upgraded to produce a sufficient and continuous quantity of nodules to support a commercial operation of about 1.3 Mtpa (wet) nodules delivered to an onshore facility.

Project Zero is characterized as a commercial, continuous operation with the following primary objectives:

- Small-scale commercial production is necessary to demonstrate the feasibility and effectiveness of the proposed mitigation and monitoring measures as a precursor to scaling up commercial production to Project One;
- Demonstrate economic viability of commercial polymetallic nodule collection;
- Demonstrate the environmental performance of a continuously operating commercial nodule collector system at a small scale prior to advancing to full commercial production with Project One;
- Demonstrate the reliability of transshipment of nodules to an RKEF processing facility;
- Provide an extended period of continuous operation to further quantify and characterize the environmental impacts of a commercial operation prior to ramping up to a full capacity commercial collection system.
- Address any technical or environmental performance improvement opportunities with the prototype collector system not fully resolved during the short-duration prototype collector test;
- Test assumptions made by the EIS and predictive modeling prior to increasing the scale of commercial production by advancing to Project One;
- Allow for the testing and calibration of the Adaptive Management System developed for NORI-D prior to increasing the scale of commercial production by advancing to Project One;
- Demonstrate and refine the methods and measures described in the Environmental Monitoring and Management Plan developed for NORI-D prior to increasing the scale of commercial production by advancing to Project One.

While actual capital costs may differ from those currently anticipated, as of Q2 2022 the current estimates for costs to bring the Project Zero offshore system into production is $110 million. NORI and Allseas intend to equally finance all costs related to developing the first commercial system.

Project Zero entails:

- Refurbishment of a production vessel (the *Hidden Gem,* see Image 2)
- Nodule collection using one collector robot (1.3 million wet tonnes per year)
- Transshipment of the nodules to an existing or "brownfield" port facility (location yet to be finalized)
- Stockpiling and tolling the nodules through existing RKEF processing facilities

NORI has also engaged in several technical scoping studies to determine the potential for a first small-scale production plant location and outputs.

Image 2: The Hidden Gem, a converted 228-meter-long drillship

Source: Allseas (accessed 3/26/2022); prototype robotic collector highlighted in yellow circle

3. Project One

Subject to achieving the objectives for Project Zero, NORI will propose to ramp-up operations to Project One. Full implementation of Project One as currently planned would involve a three-step progression. As illustrated in Figures 4 and 5, these steps involve scaling up collection and processing from 1.3Mtpa to an approximate average of 12.5Mtpa of wet nodules at steady state production (expected 2030-2045).

As currently estimated, the steps to ramp-up entail: (1) the introduction of a second converted drillship (Drillship 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), totaling a maximum annual capacity of 14.1 Mtpa (wet) and an annual average of 12.5 Mtpa (wet) over life of mine. Project One is expected to benefit from lessons

learned during the Collector Test and Project Zero. Prior to commencing Project One, NORI will provide the ISA with documentation detailing how the objectives for Project Zero have been achieved.

Processing Nodules

The processing of the nodules will also be ramped up in phases and NORI is considering several options.

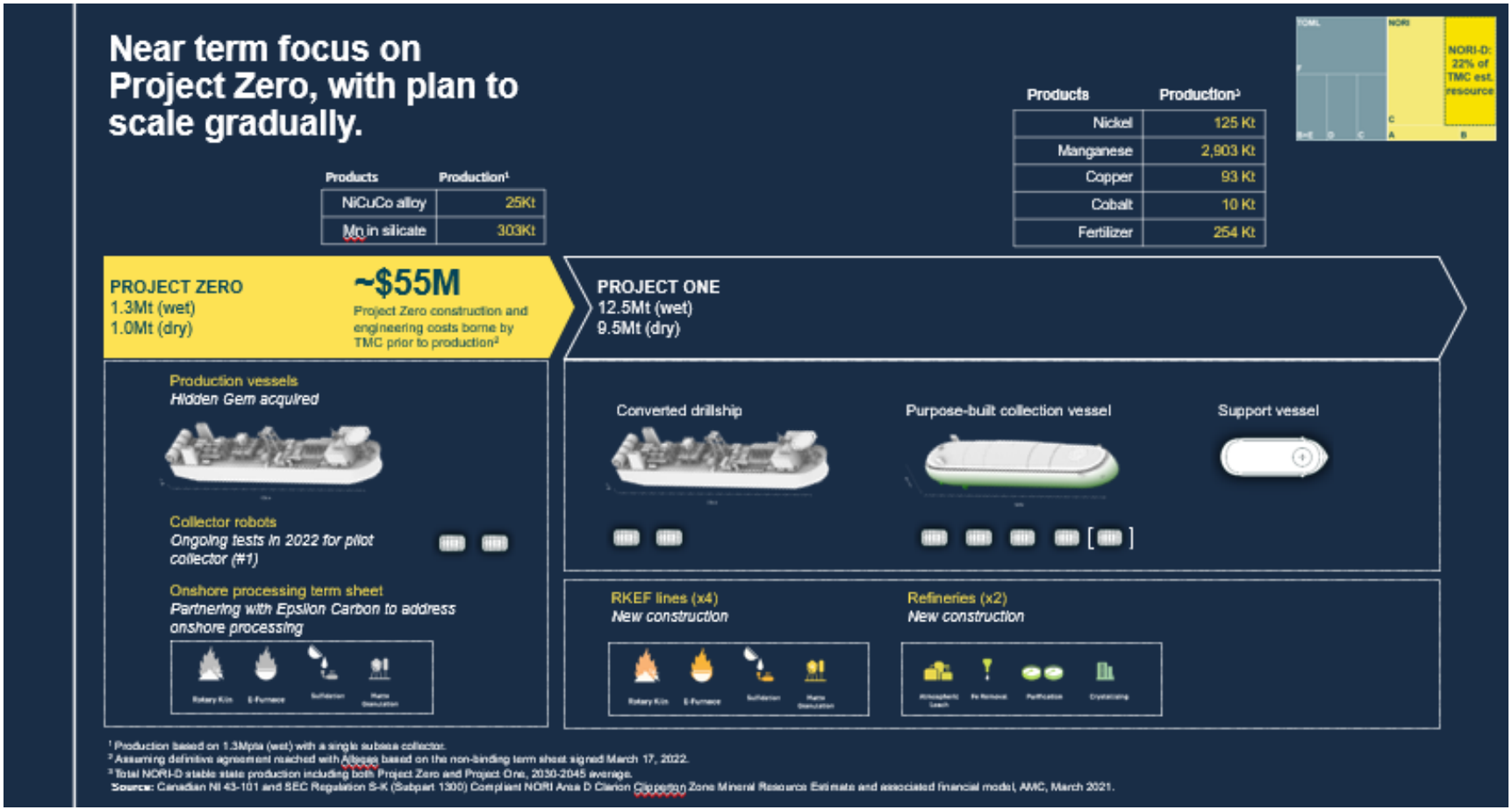
For Project Zero, NORI intends to toll-treat polymetallic nodules at existing Rotary Kiln-Electric Furnace (RKEF) facilities, utilizing excess industry capacity. NORI advises there is significant interest from several parties in Asia to utilize RKEF plants which have become stranded as a result of the 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 be converted to toll-treat polymetallic nodules.

Simultaneously, NORI is examining a business collaboration with Epsilon Carbon Pvt[11]., LTD. to complete a pre-feasibility study for a commercial nodule processing plant powered by renewable energy to process 1.3 Mpta of wet nodules in India.

For Project One, the collected nodules are expected to be processed, either at a new facility to be constructed by TMC, or by potential processing partners, subject to available capital, and at third-party facilities pursuant to a toll-treatment model.

[11] The Metals Company Enters into Business Collaboration MoU with Epsilon Carbon to Complete A Pre-Feasibility Study For the World's First Commercial Polymetallic Nodule Processing Plant in India | The Metals Company

Figure 4: Illustration of NORI-D development plans



Source: Q1 2022 Update investor presentation. 1 Production based on 1.3 Mtpa (wet) with a single collector; 2. Assuming definitive agreement reached with Allseas based on the non-binding term sheet signed March 17, 2022; 3. Total NORI-D stable state production including both Project Zero and Project One, 2030-2045 Average Source: Canadian NI 43-101 and SEC Regulation S-K (Subpart 1300) Compliant NORI Area D Clarion Clipperton Zone Mineral Resource Estimate and associated financial model, AMC, March 2021

Figure 5: NORI-D project development schedule to achieve commercial production in 2024

Source: TMC. Note: Timelines represents estimates and may be subject to change and regulatory approval

D. Unique Attributes

As detailed further in this document, the Project's nodule collection has numerous unique attributes when compared to land-based mines. Typical attributes of a generic, large-scale mining operations are contrasted with the NORI-D Project's nodule collection. While this table shows that many typical concerns relating to construction and operation of a land-based mine are absent for NORI-D's Project, it is not implied that there may not be other types of impacts. These will be studied as part of the Project's environmental and social impact assessment.

Table 2: Comparing key aspects of generic land-based mines with NORI-D

Attributes	Mine	NORI-D
Multi-year construction of the mine and required infrastructure[12]	Yes	No
Co-location with local communities, and/or Indigenous People/Territories	Yes	No
Resettling of Affected Communities within mine footprint, required infrastructure, or buffer zones	Yes	No
Large-scale worker camps for construction and operation (hundreds to thousand of workers)	Yes	No
Arrival of up to thousands of workers from other regions or countries	Yes	No
Health, safety, and fatality risks at scales associated with mining projects[13,14]	Yes	No
Unplanned influx (in-migration) burdening local infrastructure	Yes	No
Potential for land conflicts, presence of child labour at/near mine sites and/or supply chains	Yes	No

[12] Construction of purpose-built vessels and other equipment may also take multiple years, but are expected to be completed within existing industrial zones, manufacturing facilities, and shipyards.
[13] See also selected country statistics in ICMM, 2019. Fatality Prevention, Eight Lessons Learned, at Table 1: Mining fatalities in selected countries 2008–2018, https://www.icmm.com/website/publications/pdfs/health-and-safety/2019/publication_fatality-prevention.pdf
[14] For a comparison of human fatalities associated with mining vs. offshore operations, see Paulikas, D. et. al., (2020). Where should Metals for the Green Transition Come From? https://metals.co/download/237815/?tmstv=1668033071, page 130-134.

Attributes	Mine	NORI-D
Construction of water collection, diversion, and supply systems, competing for water sources	Yes	No
Clearing (removing) flora and associated impacts on species with special conservation status	Yes	No[15]
Developing an open mine pit or underground mine	Yes	No
Building access roads	Yes	No
Erecting transmission lines, dedicated power plant	Yes	No
Drilling dewatering or water supply well fields	Yes	No
Tailings management facilities required for large volumes of tailings generated, waste rock dumps	Yes	No
Road, rail, or port linkages for export of concentrates/products	Yes	No
Large-scale entrenchment associated with mine closure	Yes	No

Source: Prizma

In contrast to land-based mining, the proposed nodule collection requires modification (refurbishment) of one or more drill ships and construction of purpose-built ships, development, and fabrication of remotely operated nodule collector vehicles, a riser system to lift nodules to the collection vessel, development and operations of adaptive management systems, and transshipment of nodules to shore-based processing sites.

The offshore nodule collection activities are expected to involve a relatively small peak operating workforce involving back-to-back shifts of a total of approximately 150 workers per vessel (one vessel during Project Zero, three vessels during Project One, total approximately 650 workers), and additional small crews (back-to-back shifts) for multiple nodule transport vessels totaling approximately 200 workers distributed over several vessels.

The Project's onshore processing facilities are expected to have certain attributes which may be comparable to conventional processing/smelting facilities. However, NORI is exploring with strategic partners construction and/or refurbishment of strategically located "brownfield" facilities, with access

[15] While there is no flora (plants) in the cold, dark and high-pressure conditions typical of abyssal plains, concerns have been raised about adverse impacts, including on biodiversity, and ecosystem services.

to renewable power, to further minimize the operation's greenhouse gas emission profile. The size of temporary (construction) and permanent (operations) workforce for these onshore facilities have not been fully defined at this stage and are expected to be approximately 1,650.

While Table 2, above, provides a more generic comparison, Table 3 compares selected attributes of the NORI-D Project with an operating mine and processing facility: the Ambatovy Nickel and Cobalt mine (Ambatovy) in Madagascar, as a comparative alternative source of target metals. Ambatovy was selected because it is a large-scale Nickel and Cobalt mining and processing operation, was financed by numerous development banks[16] which apply the IFC Performance Standards (or equivalent), and provides data visibility (not because Ambatovy is the "best" or "worst" operation).

As highlighted in Table 3, the unique attributes of the NORI-D Project include its unique regulatory context, the nature of resources which sit unattached on the seafloor and do not require most of the typical mining infrastructure, nor removal of overburden to access it, no presence of local affected communities at the nodule collection site (nearest island and populated landmass located at a distance of approximately 700 km and 1,700km, respectively), and substantially lower resource and GHG intensity.

Similar to extractive sector projects in frontier or offshore regions, biodiversity (and other) concerns have been raised by, for example, several non-governmental organizations (and others), including calling for a 10-year moratorium on deep-sea mining[17]. It is noted that no deep-sea mining has taken place in international waters to date, although it has been studied since the early 1970's.

[16] The Japan Bank for International Cooperation (JBIC), Export-Import Bank of Korea (KEXIM), the Export Development Canada (EDC), the European Investment Bank (EIB), and the African Development Bank.
[17] See, for example, WWF's Policy Position on Deep Sea Mining: https://wwfint.awsassets.panda.org/downloads/wwf_policy_position_deep_seabed_mining_2020_final.pdf, accessed 4/4/2022

Table 3: Comparison of Ambatovy and the NORI-D Project using selective criteria[18]

Attribute	Ambatovy	NORI-D
Location	• Ambohimanarivo, Madagascar	• Deep-sea PMN collection in CCZ, located in Areas Beyond National Jurisdiction (International Waters). • Onshore facilities: not fully defined at this stage
Applicable standards	• Madagascar's jurisdiction, applied also IFC Performance Standards, Equator Principles	• ISA regulatory regime applies to NORI-D's PMN collection and is expected to include the IFC Performance Standards and Equator Principles. • Due to location in the CCZ, the Project is subject to approval, monitoring and governance by the multilateral ISA, in addition to Nauru. ISA's voting members include 167 States, including Pacific Small Islands Developing States, and the European Union. • Unique context also includes Common Heritage of Humankind (see also Box 1) and distribution of economic benefits. • Onshore facilities will be subject to their host countries regulatory requirements (not the ISA). NORI plans to adopt GIIP.
Project cost	• US$9.0 billion[19]	• Estimated US$7.2 billion (NORI-D Project Zero and Project One, including offshore and onshore facilities)
Description	• Includes open-pit mining, slurry pipeline, leach process plant, tailings facilities, harbor expansion	• The phased NORI-D Project (comprising Project Zero and Project One) involves the deep-sea collection of PMN, transshipment to and through existing ports for toll-treatment at existing rotary kiln-electric furnace smelters, and/or future development of a new-built facilities and nodule processing plant.

Production	• 2021:
	  ○ Nickel: 29.3 kt
	  ○ Cobalt: 2.1 kt
	  ○ Ammonium sulfate: 93.4 kt
		Project Zero:
		• NiCuCo alloy: 25,000 tonnes/year; Manganese in silicate: 303,000 tonnes/year
		Project One (steady state, 2030-2046) annual production:
		• Nickel: 125 ktpa

[18] References: Dynatec Corp., 2006. Environmental Assessment Ambatovy Project Summary; Ambatovy Sustainability Reports 2010, 2017 - 2019; https://ambatovy.com/en/sustainability/environment/conserving-local-biodiversity/ accessed 4/15/2022; NORI (see also Figure 6 and footnotes); TMC draft 2021 Sustainability Report; health and safety statistics presented include TMC, NORI, GreenMetals and Contractors. LTIFR – time injury frequency rate. DSM – Deep-sea mining

[19] https://www.jwflegal.com/experience/mining/advice-on-us-8-5bn-ambatovy-project-financing-in-madagascar/, accessed 4/17/2022

Attribute	Ambatovy	NORI-D
		• Cobalt: 10 ktpa • Manganese: 2,903 ktpa • Copper: 93 ktpa • Ammonium sulfate: 254 ktpa
Tailings Management Facility	• Ambatovy's TMF and its consequence of failure classification not reported to/ available at the Church of England's Global Tailings Portal	• No tailings generated. NORI-D's collecting PMN from the deep-sea does not entail the construction of a TMF.
Other mining waste	• Industrial waste, including ash, Sulphur waste, and scrap metal	• It is expected that approximately 90 percent of the entrained sediments collected with the nodules will be separated and discharged at the seafloor level, with additional discharge of entrained sediment and nodule debris at a depth to be confirmed following the Collector Test and impact assessment studies (currently assumed 1,200 meters below surface).
Workers or Jobs created	• Construction: 18,000 • Operations: 3,500	**Project One** • Offshore construction (at existing fabrication and shipyards): assumed approx. 250 • Offshore operations: estimated 650 workers for collector vessels, 200 for transport vessels • Onshore operations: approximately 1,650 workers (strategic choices, locations under review)
Health, Safety & Security	• 2015 – 2019: • Fatalities: 3 in 2015, 1 in 2019 • LTIFR range: 0.02 to 1.31 • Significant security incidents reported annually	• TMC: 2018 – 2021 (incl. subcontractors, still exploration stage, focused on off-shore activities) • Fatalities: 0 • LTIFR: 0 • No significant security incidents. • NORI-D expects to adopt and apply GIIP for its future land-based operations and facilities.
Resettlement impacts	• 296 families	• None (0) expected for offshore component of Project Zero and One. None expected for undefined onshore facilities as expect to use of brownfield port facilities and RKEFs, at least initially (Project Zero), would suggest new resettlement impacts unlikely or very limited.

Attribute	Ambatovy	NORI-D
Biodiversity	• Madagascar is considered one of world's biodiversity hotspots[20]. Impacts forest/land 2,854 ha (28.54 km^2). Ambatovy reports presence of 109 flora species of concern, 118 species of birds, 92 species of amphibians, 69 species of reptiles. Over 50 endangered or critically endangered flora and fauna species. Developed an offset program and to achieve no net loss in biodiversity, preferably a net gain.	• NORI-D is located in generally common habitat (abyssal planes cover 70% of ocean floor[21]) –Total nodule collection/mine size area for NORI-D is approximately 25,000 km^2. • Within NORI-D, preservation reference zones (PRZ, approximately 10-14% of total NORI-D contract area) are designated "no mining" areas. NORI expects to identify and select these so that they represent key biotopes within NORI-D. NORI will also leave behind undisturbed nodules so that they can serve as "stepping stones" for connectivity across NORI-D. Currently, its is not definitively known how effectively the risk of biodiversity loss could be mitigated or reduced for deep nodule collection. • To safeguard seafloor biodiversity and ecosystem functions of the CCZ, the ISA designated "Representative Areas of Particular Environmental Interest" (which are effectively "no mining" areas) and cover about 43% of CCZ.
GHG Emissions	• 2021: approximately 1,621,000 tCO2 (includes operation's coal power plant contributing about 60%). • No project LCA-type GHG intensity data in public domain.	• An on-going life-cycle assessment (LCA) of the NORI-D's nickel indicates a Global Warming Potential (GWP) of approximately 0.51kg of CO_{2e} per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the Nickel produced from NORI-D results in 94%, 78% and 68% lower GWP, respectively[22].

References: Dynatec Corp., 2006. Environmental Assessment Ambatovy Project Summary; Ambatovy Sustainability Reports 2010, 2017 - 2019; https://ambatovy.com/en/sustainability/environment/conserving-local-biodiversity/ accessed 4/15/2022; NORI (see also Figure 6 and footnotes); TMC draft 2021 Sustainability Report; health and safety statistics presented include TMC, NORI, GreenMetals and Contractors. LTIFR – time injury frequency rate. DSM – Deep-sea mining

[20] According to Conservation International, an NGO, around the world, 36 areas qualify as hotspots. Their intact habitats represent just 2.5% of Earth's land surface, but they support more than half of the world's plant species as endemics — i.e., species found no place else — and nearly 43% of bird, mammal, reptile, and amphibian species as endemics.
[21] https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-floor-features
[22] Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. At the time of drafting this document, BMI LCA Results are undergoing third party verification.

E. Project Justification

Economic Rationale

As detailed above (Project Description), NORI plans to collect PMN from the seafloor of the abyssal planes seafloor at over 4,000 meters depth, within the CCZ in the Pacific Ocean. These nodules contain metals commonly used for Li-ion battery cathodes as well as other uses, such as electric wiring and steel. The nodules contain nickel, cobalt, copper, and manganese—viewed as critical or strategic in many countries around the world given their role in enabling the clean energy transition.

According to TMC's October 2022 corporate presentation[23], the capital spent on the NORI property has been approximately $250 million since 2011, and the net present value (NPV_9) of the NORI-D Project is estimated at US$6.8 billion at CRU long-term metal prices (Feb 2021) and US$13 billion at more recent metal prices (October 12, 2022)[24].

Benefit Sharing

According to AMC's 2021 Initial Assessment[25], the Project will generate approximately US$7.2 billion in cumulative royalties, which is mostly payable to the ISA. The detailed modalities of such payments have yet to be finalized by the ISA. This compares to ISA's 2021-2022 budget of approximately $19.5 million[26].

The ISA is required to earmark revenues collected from the Area for the following three priority areas:

1. Provide for its administrative expenses (also replacing the contributions from ISA Member States),
2. Contribute to a fund to assist developing countries which may suffer adverse effects on their export earnings or economies due to deep-sea mining, and
3. Equitably distribute excess revenues for the benefit of humankind.

The ISA's largest and lowest five beneficiaries identified using models of equitable distribution of financial payouts from deep-sea mining royalty fund are tabulated below (see ISA's publications[27] for details of methodologies developed and applied).

[23] See "Latest Presentation" at https://investors.metals.co/, accessed October 14, 2022
[24] SEC Regulation S-K (Subpart 1300) Compliant NORI Area D Clarion Clipperton Zone Mineral Resource Estimate and associated financial model, 17 March 2021. NORI-D resource – 11 MT inferred @ 1.4% Ni, 1.1% Cu, 0.1% Co, and 31.0% MN and 15.6 kg/m2 abundance, 341 MT Indicated @ 1.4% Ni, 1.1 % Cu, 0.1% Co and 31.2% Mn and abundance 17.1 Kg/m2, 4 MT Measured @ 1.4% Ni, 1.1% Cu, 0.1% Co, and 32.2% MN and 18.6 Kg/m2.
[25] AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clippperton Zone, in accordance with the requirements of SEC Regulation S-K (subpart 1300), dated March 17, 2021
[26] ISA, 2022. Secretary General Annual Report 2022, Ensuring the Sustainable Management and Stewardship of the Deep Seabed and its Resources for the Benefit of Humankind, see https://isa.org.jm/files/files/documents/ISA_Annual_Report_2020_ENG_1.pdf.
[27] ISA, 2022. Equitable Sharing of Financial and Other Economic Benefits from Deep-Sea Mining, ISA Policy Brief 01/2022

Table 4: Largest and lowest five beneficiaries of deep-sea mining royalty funds

Country	Population (% of total)	Average GNI per Capita (US$)	Geometric Mean Formula (%)	Original Formula (%)
Indicative shares of the largest five beneficiaries (top 5 ranking varies by approach, so 6 listed)				
India	20.51	1,916	7.23	27.72
DR Congo	1.25	500	3.50	0.10
China	21.23	9,320	3.34	5.90
Somalia	0.22	107	3.19	5.41
Pakistan	3.19	1,535	3.18	5.38
Bangladesh	2.45	1,613	2.72	3.93
Indicative shares of the lowest five beneficiaries				
Tuvalu	<0.01	5,475	0.0125	<0.001
Palau	<0.01	17,418	0.0088	<0.001
Cook Islands	<0.01	19,983	0.0085	<0.001
Nauru	<0.001	12,026	0.0042	<0.001
Monaco	<0.001	180,859	0.0001	<0.001

Source: ISA Policy Brief 01/20022, Equitable Sharing of Financial and Other Economic Benefits from the Deep-Sea Mining, see Table 1, GNI – Gross National Income.

The ISA is also considering establishing a global fund, modeled after the Global Environmental Facility[28], to invest in knowledge and competence related to the Area[29]. This would include basic and applied research, capacity-building, and fostering other public goods related to the deep-sea.

In addition, over its lifetime, the integrated NORI-D project is estimated to pay a total of US$9.1 billion in onshore corporate tax, expected to be payable to the host nation of the processing plant[30]. Third-party service providers to the Project would also be paying additional taxes in their own jurisdictions.

Pursuant to its sponsorship agreement with NORI, which is subject to review from time to time, Nauru would receive a payment linked to quantity of nodules recovered from the exploitation contract area.

[28] https://www.thegef.org/
[29] ISA, 2022. Equitable Sharing of Financial and Other Economic Benefits from Deep-Sea Mining, ISA Policy Brief 01/2022
[30] AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clippperton Zone, in accordance with the requirements of SEC Regulation S-K (subpart 1300), dated March 17, 2021

NORI-D integrated project is estimated to be USD 9.2 billion in taxes over lifetime of the project. A share is attributable to offshore nodule collection and transport. Currently, NORI is not subject to CIT in Nauru because as a small island developing state, Nauru does not have in place reciprocal tax agreements. This could subject NORI to double taxation and disadvantage NORI when compared to land-based producers and ISA Contractors sponsored by larger more developed States. NORI and Nauru are working to resolve this issue.This could generate a significant additional financial benefit to Nauru. While both parties are committed to this outcome, it still requires finalization.

Averting Climate Crisis requires More Metals

A 2021 study by the International Energy Agency (IEA) notes that reaching the goals of the Paris Agreement would require a quadrupling of mineral requirements for clean energy technologies by 2040. A goal of reaching net-zero globally by 2050, would require six times more mineral inputs in 2040 than today[31]. This means that, at current scale and speed of metals production, it will not be possible to avoid catastrophic consequences of global warming and reach the Paris Agreement targets of keeping temperatures below or well below 2°C by the end of the century.

The above refenced study also highlights that increasing recycling would not eliminate the need for new supplies, as not enough stocks of these metals have been accumulated to date. The IEA estimates that by 2040, recycled quantities of copper, lithium, nickel, and cobalt from spent batteries could reduce combined primary supply requirements for these minerals by around 10 percent[32]. This means that around 90 precent of a continuously growing demand will require other sources for the foreseeable future.

According to a 2022 IEA study focused on the global supply chains for EV batteries[33], its supply chains will have to expand ten-fold to meet government EV ambitions. For nickel, IEA estimates that 41 to 60 additional mines (with average 38 kt of nickel production per year) will be required by 2030 to meet projected demand from the 2021 demand level.

Several challenges exist in obtaining the necessary metals on a timeline meaningful to mitigate climate change. As land-based ore grades continue to decline, extracting these metals requires more energy, exerts upward pressure on production costs, increases water stress, generates more greenhouse gas emissions[34], and impacts more areas with high biodiversity value, such as those located in Indonesia, New Caledonia, and the Philippines[35].

Reducing Dependency

The expected supply deficit is being exasperated by geopolitical, security, and other supply chain risks linked to dependencies on a few countries which dominate the mining and processing of battery metals today. For example, the world's three largest Nickel operations, ranked by resource size, comprise Nornickel (based in Russia), FeNi Halmahera (based in Indonesia, with offtake agreements with

[31] IEA, 2021. The Role of Critical Minerals in Clean Energy Transition.
[32] IEA, 2021. The Role of Critical Minerals in Clean Energy Transition.
[33] IEA, 2022. Global Supply Chains of EV Batteries
[34] Kregoir, Liesbet, 2022. Metals for Clean Energy: Pathways to solving Europe's raw materials challenge
[35] https://www.maplecroft.com/insights/analysis/mining-operations-face-growing-biodiversity-risks

Chinese companies[36]), and Jinchuan (China)[37]. Australia and Indonesia have the largest reserves of nickel globally with over one-fifth of all nickel deposits each. Nickel production from Indonesia has grown almost three times since 2017, and the country is now the largest producer with over 30% of the global production[38].

In 2021, the United States (US) government announced[39] a target of 50 percent electrical vehicle sales by 2030. At the same time, the Biden administration's 100-Day Review[40] of Critical Minerals Supply Chains estimated that fully electrifying US car sales would require 1,273 kilotons per annum (ktpa) of Class 1 nickel and 160 ktpa of cobalt. This compares with existing US-based primary production of 14 ktpa of Class 1 nickel and 0.5 ktpa of cobalt.

Low-carbon Metal Production

An on-going life-cycle assessment (LCA) of the NORI-D's project indicates a Global Warming Potential (GWP) of approximately[41] 0.51kg of CO2e per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the Nickel produced from NORI-D results in 94%,

[36] https://www.woodmac.com/reports/metals-pt-halmahera-persada-lygend-nickel-operation-517159/

[37] Global Nickel Industry Cost Summary, Wood Mackenzie, August 2020; inclusive of reserves; Asset Reports for Dumont, Wingellina, Araguaia, NiWest Laterite, Norilsk, FeNi Halmahera, Jinchuan and Koniambo, Wood Mackenzie

[38] Nickel Investing News, Top 9 Nickel-producing Countries (Updated 2022), Accessed on October 3, 2022

[39] https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/#:~:text=August%2005%2C%202021%20%E2%80%A2%20Statements%20and%20Releases%20President,and%20Advance%20Smart%20Fuel%20Efficiency%20and%20Emission%20Standards accessed 4/14/2022

[40] https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/08/fact-sheet-biden-harris-administration-announces-supply-chain-disruptions-task-force-to-address-short-term-supply-chain-discontinuities/ accessed 4/14/2022

[41] Source: NORI and Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. BMI LCA results are undergoing third party verification (November 2022)

78% and 68% lower GWP, respectively. The result of the LCA for NORI-D Project's emissions are depicted below and are still subject to third-party verification.

Figure 6: NORI-D Project CO2e emissions

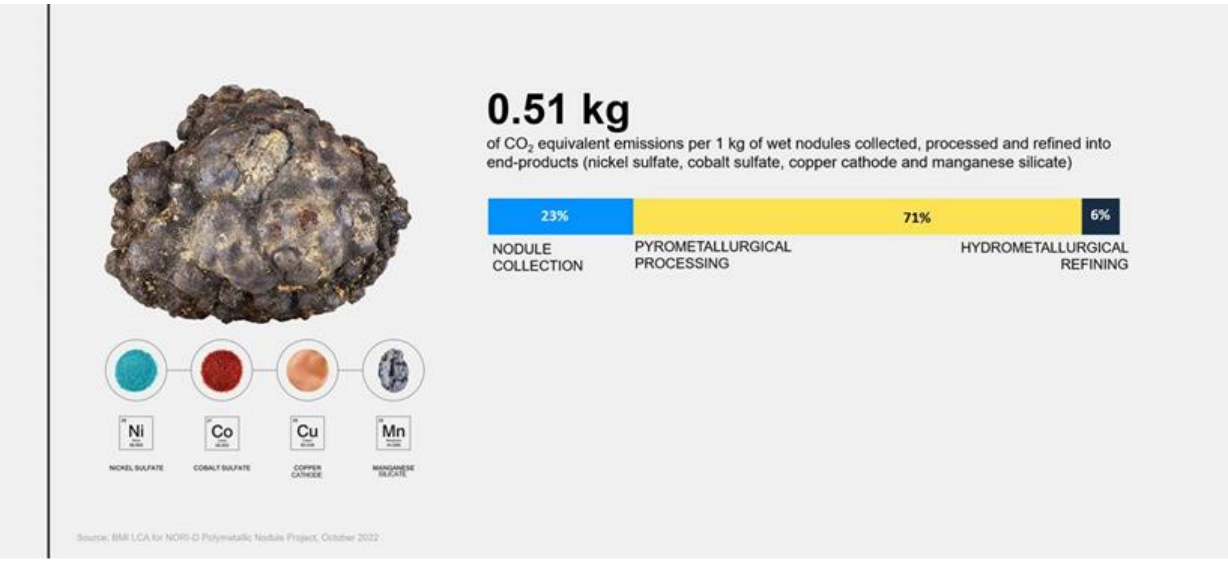
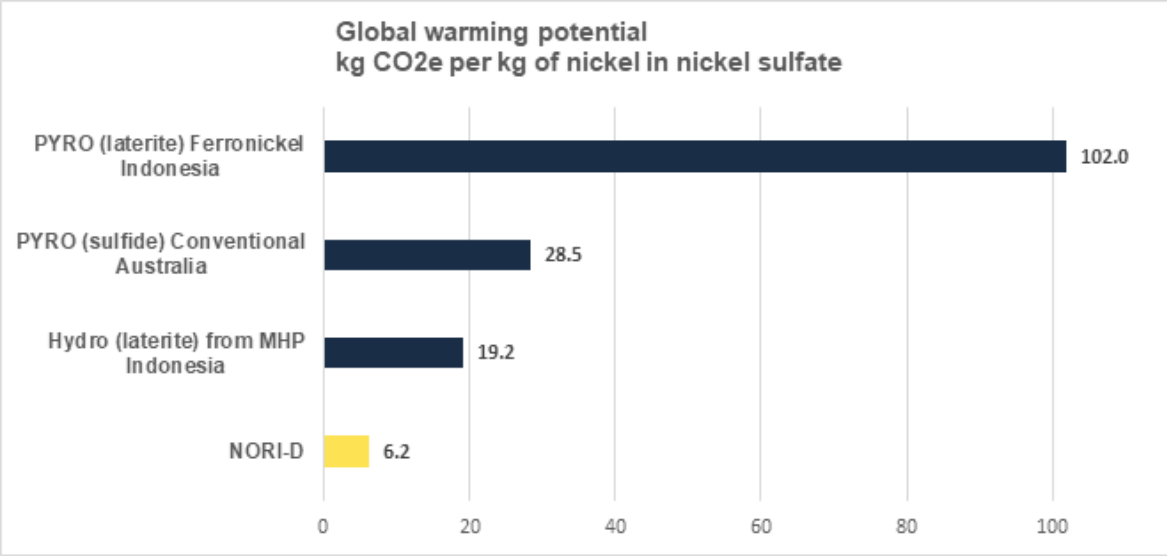


Figure 7: Global warming potential (kg CO2e per kg of nickel in nickel sulfate)



Source : NORI and Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. BMI LCA. Results are undergoing third party verification (November 2022).

No Tailings Dams

The combination of higher grades found in nodules, no overburden[42] to be removed as the nodules sit unattached on the seafloor and developing a nodule processing flowsheet which features near-zero solid processing waste generation, means that NORI-D Project is expected to have a substantially lower resource intensity and does not require tailings dams typically used for land-based mining operations.

Social Impacts of Alternatives

Without contributions from deep-sea PMN nodule collection in the CCZ, the demand for energy transition metals will result in ongoing and/or additional expansion of existing and/or start-up of new land-based operations. According to a 2022 IEA study focused on the global supply chains for EV batteries[43], IEA estimates that 41 to 60 additional nickel mines (with average 38 kt of nickel production per year) will be required by 2030 to meet projected demand from the 2021 demand level.

Recent scientific and financial research publications outlined further below highlight the social challenges - especially in terms of Indigenous Peoples - associated with the development of energy transition minerals in both developing and developed countries.

At a global level, a 2022 article by Owen *et al.*[44] notes that energy transition minerals and metals mining (ETM) projects routinely require land that is already occupied or used for other purposes. The authors conclude that in the sample studied (n= 5,097), 69 percent of ETM projects are situated in areas with Indigenous Peoples' and peasant land.

For the USA, a 2022 MSCI Inc. article[45] highlights that 97 percent of Nickel, 89 percent of copper, 79 percent of lithium, and 68 percent of cobalt reserves and resources are located within 35 miles (56 km) of Native American reservations (Figure 8), and many such operations have been facing opposition.

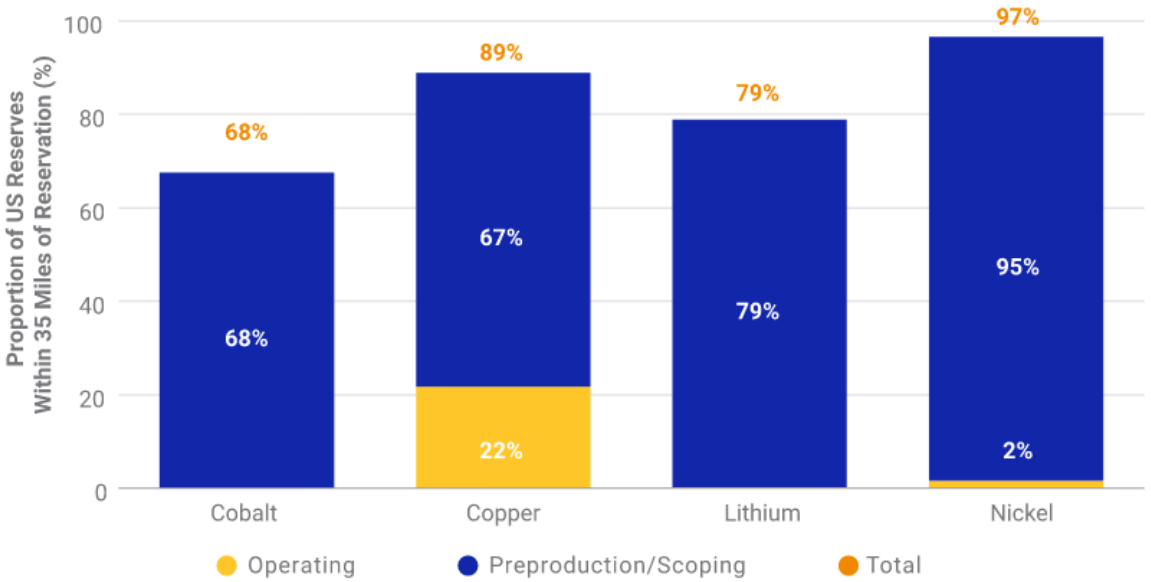
[42] Approximately 5cm of seabed sediments are expected to be entrained and collected during the nodule collection process. It is expected that approximately 90 percent of the entrained sediment collected will be separated and discharged at the seafloor level. The balance will be transported to the surface vessel to be separated and discharged back to the ocean at a depth to be determined. The scale and effect of the sediment plume generated by the collector vehicles will be tested, monitored, and analyzed during the Collector Test phase in Q3/2022.

[43] IEA, 2022. Global Supply Chains of EV Batteries

[44] Owen, J.R., Kemp, D., Lechner, A.M. *et al.* Energy transition minerals and their intersection with land-connected peoples. *Nat Sustain* (2022). https://doi.org/10.1038/s41893-022-00994-6

[45] https://www.msci.com/www/blog-posts/mining-energy-transition-metals/02531033947

Figure 8: US Transition-metal reserves within 35 miles of Native American Reservations



Source: Block, S., Mining Energy-Transition Metals: National Aims, Local Conflicts, Jun 3, 2021, ESG Research 4/14/2022

Biodiversity Opportunity Costs

Continued and sole reliance on land-based nickel and other battery metals mining operations will further increase well-known biodiversity risks (and on-going biodiversity decline[46]) without delivering the rapid battery metals supply required to enable transition towards a low carbon economy and halt global warming.

When considering the sustainability assessment of nickel mining, the 2022 KU Leuven study[47] highlights that 54 percent of global nickel production happens in areas with a high biodiversity risk, notably Indonesia, Philippines, and New Caledonia.

According to a recent article in Science[48], under business-as-usual global temperature increases, the marine systems are likely to experience mass extinctions on par with past great extinctions. However, reversing GHG trends would diminish extinction risks by more than 70 percent, preserving marine biodiversity accumulated over the past ~50 million years of evolutionary history.

The development of mitigation and monitoring strategies to avoid or reduce the risk to biodiversity loss in the CCZ and determine how long it will take for disturbed seafloor areas to recover naturally will form an important part of the operational EIS. It is noted that the total NORI-D's contract area of approximately 25,160 square kilometers (or 0.56 percent of the CCZ), will not be completely exploited. Approximately 10-14 percent of the contract areas will be set aside for preservation, and other areas are only partially exploitable for a variety of reasons, such as topographical constraints. This compares

[46] WWF Living Plant Report 2020
[47] Kregoir, Liesbet, 2022. Metals for Clean Energy: Pathways to solving Europe's raw materials challenge
[48] Penn, J., and C. Deutsch, 2022. Avoiding ocean mass extinction from climate warming, Science, 28 Apr 2022, Vol 376, Issue 6592, pp. 524-526, DOI: 10.1126/science.abe9039

to approximately 4,500,000 square kilometers comprising the CCZ. The ISA has already designated approximately 1,900,000 square kilometers or over 43 percent of the CCZ as “no mining” areas. The size of the protected “no mining” area within the CCZ is over 75 times the size of the NORI-D contract area.

The extent to which planned measures, such as leaving behind partial nodule cover and setting aside no-take zones inside contract areas would aid recruitment and recovery of nodule-dependent species in impacted areas and/or the CCZ more broadly are being studied. Such aspects have also been considered when ISA designated four additional Areas of Particular Environmental Interest (APEIs 10 - 13) in 2021[49].

Marine Scientific Knowledge and Capacity Building

The Project would also continue to contribute to the growing understanding of the deep-sea and its ecology. The datasets from scientific and other investigations by NORI are believed to be the largest by any contractor in the CCZ to date and have been collected at a cumulative expense of approximately $100 million[50]. Results of these scientific studies are provided to the ISA. Scientists deriving work from these samples are free to publish their findings.

Also, the ISA has developed DeepData, an open-source database to house all the scientific and environmental data collected by companies for the benefit of the scientific community. Data compiled as part of NORI’s EIS will be submitted to DeepData. To date, NORI has undertaken 18 offshore campaigns and over 100 studies to establish the baseline of the NORI-D license area. Data has been collected about the chemical, physical and biological characteristics of the water column and seabed in the NORI exploration area, down to 4.5 kilometers deep.

Pursuing a shared value approach and in line with ISA’s requirements, NORI also contributes to capacity building and training initiatives. In 2020 and 2021, such contributions included a scholarship for post-graduate work at University of the South Pacific, training and internship opportunities for two engineers, and 11 young scientists (of which 10 women) participating in offshore campaigns, one scholarship to Nauruan national to pursue undergraduate degree in marine sciences, and other school and literacy programs. NORI is also a co-sponsor of the ISA’s Secretary General’s Award for Excellence in Deep-Sea Research. NORI has also committed to increasing its initiatives in the coming years and once it moves into operation. Additional details about training and community development activities of NORI are provided in TMC’s 2021 Impact Report[51].

In 2022, an additional 7 students will be awarded undergraduate scholarships to study at the University of the South Pacific starting in 2023. Three have been selected through the ISA’s contractor training program[52] and another three scholarships have been advertised to be awarded by end of Q4 2022 via NORI’s in country scholarship program.

[49] https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf
[50] https://investors.metals.co/news-releases/news-release-details/metals-company-completes-latest-deep-sea-research-campaign-path accessed 4/7/2022
[51] https://metals.co/wp-content/uploads/2022/05/Final_MetalsCo_ImpactReport_052522.pdf#page=55&zoom=100,131,188
[52] Nauru Ocean Resources Inc. | International Seabed Authority (isa.org.jm)

IV. Mining Process

A. Conventional Mining

Before considering the mining and processing envisioned for NORI-D, it is useful to consider what processes are commonly used to develop mining operations on land. Conventional mining typically involves open cast or underground mining methods involving the following key activities:

- building mine camps to accommodate a workforce often measured in thousands,
- removal of forests and topsoil,
- diverting water streams,
- relocation of overburden and waste rock to waste rock dumps to access the ore body,
- mining the ore body using a mobile mining fleet, sometimes with the aid of explosives,
- processing and beneficiation the recovered ore (often using chemical additives) to generate a marketable intermediate product and by-products,
- disposing large quantities of waste materials behind tailings dams,
- transshipment of concentrates and/or intermediate products, and
- further hydro- or pyro-metallurgical processing to arrive at intermediate or end-products used in production of, for example, batteries or steel.

At the closure stage, open-pit mine sites and related facilities have typically already permanently changed (converted) land use to one or more pit lakes with variable water quality, tailings storage facilities, some with associated long-term risks, and waste rock dumps, sometimes the source of effluents with poor water quality, which may require long-term monitoring and treatment.

B. Deep-Sea Collection of PMN

The relative high-grade nodules within the NORI-D Project area are distributed unattached on the generally muddy seafloor surface of the abyssal planes at over 4,000 meters below surface, approximately 700 kilometers from the nearest island (Clarion Island, part of a designated UNESCO World Heritage site[53], which features a naval base), and 1,700 km to the nearest mainland of Mexico.

The offshore collection system consists of collector robots on the seafloor, a riser and lift system, and a surface production support vessel. The nodules would be expected to be collected from the seafloor by self-propelled, tracked collector robots using seawater jets aimed at nodules in parallel with the seafloor. 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. To test the system and assess its environmental impacts, a pilot trial of the collection system is being conducted during Q4/2022.

[53] https://whc.unesco.org/en/list/1510/

The scale and effect of the sediment plume generated by the collector vehicles, as well as numerous other parameters, is being tested, monitored, and analyzed during the Collector Test. It is expected that approximately 90 percent of the entrained sediments collected with the nodules will be separated and discharged at the seafloor level. See also section on Biodiversity Aspect further below.

At the surface production support vessel, the collected nodules will be separated from the sea water – containing any residual sediments, nodule debris, and exhibiting elevated oxygen and temperature – is discharged at a depth of approximately 1,200 meters below sea level during the collector test. Models show that this discharge is expected to mix with 500 – 1,000 times the volume of surrounding seawater within 500 m of the discharge pipe, returning the water characteristics close to background levels. The exact depth and other parameters are still subject to the outcome of the Collector Test phase (expected completion end of Q4/2022).

The location of NORI's PMN deposit means that it does not compete with alternative anthropogenic land use. There is no need for drilling, removal of plants, or overburden, use of explosives, recovering of ore from open pits or underground mining, or mine-site based beneficiation/processing, to generate higher-grade intermediate products.

Unlike conventional mines, the development of NORI-D's PMN collection process also does not require certain new infrastructure, such as tailings dams, access roads, rail lines, transmission lines, or ports, largely avoiding related impacts. Also, there will be no need for an extensive fleet of mobile mining vehicles which are displaced with sub-marine robotic collectors.

Some new facilities may be required for onshore facilities, such as Rotary Kiln-Electric Furnaces (RKEF), which may have impacts generally similar to other modern RKEFs.

C. Onshore Facilities

The collected nodules would be transported by transport vessels to onshore processing facilities. Initially, in Project Zero, this is expected to comprise existing deep-sea port and processing facilities, although final analysis, decisions, and site selections have yet to be made. NORI is also exploring the building of a commercial small-scale Project Zero processing plant and using existing RKEF facilities.

In March 2022, TMC announced[54] that it entered into Business Collaboration Memorandum of Understanding with Epsilon Carbon, India's leading producer of graphite materials for lithium-ion battery anodes with ambitions to enter cathode material production, to complete a pre-feasibility study for the world's first PMN processing plant in India. Epsilon Carbon intends to deliver a pre-feasibility report for a plant in India powered by renewable power and with the targeted processing capacity of 1.3 million tonnes per annum of wet nodules. In parallel, TMC is exploring potential toll-treatment options through existing RKEF facilities.

For Project One, the options being considered include the construction of a purpose-built processing plant, including pyrometallurgical and hydrometallurgical circuits.

[54] https://investors.metals.co/news-releases/news-release-details/metals-company-enters-business-collaboration-mou-epsilon-carbon

From a social risk and impact perspective, facilities that will process nodules collected from the NORI-D area can be expected to be generally similar to those generated by other Rotary Kiln-Electric Furnace (RKEF) or "heavy industry" facilities. TMC selection criteria bias includes existing industrial sites with established ports, available renewable power, available gas, and proximity to trained workforce and existing infrastructure.

As will be detailed in TMC and/or NORI's policies and commitments, the NORI-D Project is expected to meet or exceed host country regulatory requirements, as well as integrate ESG principles and guidelines, such as those set forward by the IFC Performance Standards and Equator Principles, the UN Sustainable Development Goals (SDGs), and the Task Force for Climate-related Financial Disclosure (TCFD).

D. Biodiversity Aspects

To better understand the CCZ ecosystem and establish a baseline, NORI has been working with numerous world-leading deep-sea research institutions. These organizations are independent of NORI (and TMC), and researchers contractually retain their academic freedom to publish results. Institutions include Sweden's University of Gothenburg; the UK's Natural History Museum, National Oceanography Centre, University of Leeds, and Heriot Watt University; USA's University of Hawaii – Manoa, Texas A&M University, Florida State University; and the Japan Agency for Marine-Earth Science & Technology. This work is part of NORI's ESIA program, consisting of more than 100 discrete studies throughout the water column, from seafloor to surface.

TMC has also entered into a research funding agreement with a consortium of institutions led by Australia's Commonwealth Scientific Industrial Research Organisation (CSIRO). These institutions are tasked to create a framework for the development of an ecosystem-based management and monitoring plan (EMMP) for NORI-D. CSIRO will collaborate with researchers from Museums Victoria, Griffith University, and the University of the Sunshine Coast in Australia, as well as the National Institute of Water and Atmospheric Research (NIWA) in New Zealand.

TMC is also working with Kongsberg Digital to develop a "digital twin" for subsea nodule collection, which is a core component of a broader Adaptive Management System designed to enable sub-sea operations within targeted environmental impact thresholds. This planned Adaptive Management System will generate data feeds from environmental and operating sensors, use machine learning to make environmental impact predictions and include an environmental dashboard for monitoring and reporting impacts.

NORI-D's contract area is approximately 25,160 square kilometers. The monitoring outcome of the integrated Collector Test will help determine what percentage of this area may need to be designated as Preservation Reference Zones (PRZ). It is currently assumed that this may range from approximately 10 – 14 percent of the contract areas, representing all biotopes within the NORI-D area. It is also anticipated that up to a percentage of nodules would be left behind in the NORI-D operational area to act as "stepping stones" (providing connectivity) across the NORI-D area.

NORI's contracting area compares to approximately 4,500,000 million square kilometers comprising the CCZ. The ISA has already designated approximately 43 percent (about 1,900,000 million square kilometers) of the CCZ as APEI. This will allow these areas to function as *refugia* and provide repositories of genetic diversity representative of the CCZ and areas affected by deep-sea mining. In

the ecological literature[55], *refugia* have been defined as habitats that convey spatial and temporal resistance and/or resilience to biotic communities affected by disturbances, or as places or times where the negative effects of disturbance are lower than those in the surrounding area.

Biodiversity issues – as well as other environmental topics – will be included in the environmental impact assessments process. Linkages which may lead to significant social impacts will also be assessed.

E. Closure

Prior research indicates that the density, diversity, and function of fauna representing most of the resident biomass (including mobile, pelagic, and microbial life) are expected to recover naturally over years to decades. However, a high level of uncertainty exists around recovery of fauna that requires the hard substrate of nodules for critical life function. The extent to which planned measures such as leaving behind partial nodule cover and setting aside no-take zones would aid recruitment and recovery of nodule-dependent species in impacted areas will depend on factors like habitat connectivity, which is an area that is still under study. The Collector Test (expected completion Q4/2022) will represent the first temporal data point in the long-term monitoring program for the Impact Reference Zone (IRZ) and Preservation Reference Zone (PRZ). IRZs and PRZs are important in identifying natural variations in environmental conditions against which the impacts of mining can be assessed. A post-test long term monitoring program for the IRZ will be included in the Environmental Management and Monitoring Plan (EMMP) to be developed for submission with the application for the exploitation contract.

[55] https://www.iucn.org/resources/issues-briefs/biodiversity-offsets

V. Feasible Alternatives

A. Introduction

According to the International Association for Impact Assessment[56], a review of alternatives requires consideration of projects of a similar technical character or functionality that will meet the specified objective. Alternatives could be different locations, sizes, technologies, design, time frames, or operational procedures. The alternatives process should consider different ways of achieving the same objective. The "no action" (also known as the "zero alternative") should also be part of the analysis.

Given the focus of this SIA Scoping Document on social and livelihood aspects (including related ecosystem services) of the Project, the key alternatives considered are those linked to social issues. The operational EIA – and additional future ESIA-type studies which may be required for onshore processing facilities - will also consider other types of alternatives and their impacts, which are not discussed in this document.

Examples of such significant alternatives which are not discussed in this Scoping Document include, for example, siting of onshore facilities to ensure access to renewable power to minimize the operational carbon footprint of the processing facilities. Onshore facilities will be subject to their host countries' regulatory requirements. They do not fall within the regulatory regime of the ISA, which is focused on the ABNJ.

B. Alternatives in Conventional Mining

Alternatives in ESIA processes for a new mining project typically include mining methods (such as open pit or underground), and ore processing. Such alternatives are often influenced or limited by ore types and their metallurgical characteristics, and ore-body characteristics, such as homogeneity and depths, prevailing technologies, and cost, among other factors.

Many other alternatives involving social consideration which can be influenced by area footprint, environmental and social constraints, or contextual issues (such as availability of grid power or workforce, or legacy issues, such unresolved Indigenous claims, or past conflicts), and site-selection decisions for numerous infrastructures typically required. These can range from (participatory) selection of suitable sites for relocation of resettlement communities to identifying suitable sites for placement of waste rock dumps and tailings storage facilities.

Tailings storage or management facilities have emerged as a major concern of land-based mining projects. For example, since Vale SA's Brumadinho tailings dam disaster in Brazil, which released nearly 12 million cubic tons of mining waste (tailings) and killed 270 people[57], the Church of England has led a campaign by institutional investors to disclose the scale of risk and improve its management related to approximately 3,500 active tailings storage facilities worldwide[58]. The NORI-D Project does

[56] https://iaia.org/uploads/pdf/FasTips_11_AlternativesinProjectEIA.pdf
[57] https://www.mining.com/web/sec-sues-vale-for-false-claims-tied-to-brumadinho-dam-collapse/
[58] https://www.churchofengland.org/about/leadership-and-governance/church-england-pensions-board/pensions-board-investments/investor

not require tailings storage facilities (and is not subject to related risks), nor many other typical infrastructures required for conventional mining projects.

For NORI-D's significant onshore installations, such as those related to the construction of bespoke hydro- and pyrometallurgical processing facilities, there is currently insufficient information available to conduct any meaningful analysis of alternatives. However, given that the resource is collected and transported on a ship, existing industrial complexes accessible by deep-water ports are expected to offer the most energy and cost-efficient option.

While onshore facilities fall outside the jurisdiction of the ISA, its guidelines indicate the need to include consideration of Product Stewardship. It is expected that TMC and NORI will commit to meeting applicable host country regulatory requirements, as well as the IFC Performance Standards and Equator Principles.

More recently, new mining projects have also started to review feasible alternatives of other fuel and power needs in an effort to materially reduce their carbon footprint and align with the Paris Climate Accord. Examples of alternatives range from switching from fossil fuel to low-carbon mobile equipment, to considering integrating renewable power and battery storage options.

Without any further action, the NORI-D Project would generally be expected to be among the lowest carbon intensive battery metals producing operations. The company's on-going or planned studies already include access to renewable energy sources as a search criterion and will be discussed in the ESIA or other studies related to those facilities. As detailed further in its 2021 Impact Report, TMC has completed an assessment of its historic CO_2 emissions from 2012-2021, which total approximately 38.5kt CO_{2e}. TMC plans to offset these in the future using standard and blue carbon credits, which would also support related projects in Pacific Island nations.

C. No Action and Counterfactual

A preliminary comparison of "positive" and "negative" social effects considering the "No Project" versus "With Project" alternative is provided further below. Table 5 also includes a "Counterfactual" scenario, as the "No Project" option scenario will likely trigger other actions with their own risks/effects to satisfy the growing battery metals shortage. In other words, "No Project" does not equal elimination of social (and other types of) risks. Instead, such risks can be expected to be shifted to other projects/operations elsewhere.

Table 5: Preliminary comparison of "With Project," "No Project" and "Counterfactual" scenarios

Category	With Project	No Project	Counterfactual
Socio-Economic impacts	CAPEX of US$7.2 billion combined for Project Zero and Project One. Total ISA and Nauru royalties over project life: US$7.2 billion (excess revenues and other economic benefits to be distrusted equitably for the benefit of humankind. Total onshore payments and taxes paid over project life (partly paid in Nauru): $9.1 billion. Third-party service providers to the Project would also be paying additional taxes in their own jurisdictions. Proof of concept of deepsea mining. New source of key battery metals that can help meet growing demand, limit escalation of cost for selected EV batteries. Development and expansion of ISA to reflect increasing responsibilities.	No positive economic ripple effects from major investments including employment, capacity building and training and social investments. No Project revenues for the Republic of Nauru, the ISA (humankind), shareholders, countries hosting onshore processing facilities, and offshore contractors and service providers. No potential negative impacts on Developing Land-Based Producer States' (DLBPS) export earnings or economies. Delaying deep-sea research and mining industry in the Area governed by the ISA. No additional new source of critical metals required for transition to low-carbon economies.	Expansion of existing or development of new conventional mining projects, for example, in Indonesia or other emerging markets. Continued drive to develop DSM within national exclusive economic zones, subject to national jurisdictions (and not subject to multilateral ISA regime). DLBPS continue to be subject to global market forces, with no potential DLBPS compensation opportunities. Limited economic diversification and growth opportunities for Nauru. Limited supply of battery metals with growing demand, exacerbated due to geopolitical events (and potential sanction of Russia, a major nickel producer/exporter), driving up costs, including for electric vehicles, disproportionality impacting those with lower-income, and slowing down transition to low carbon economy.
Livelihoods	No locally based communities for the offshore operations site (no related +/- impacts). Onshore (brownfields?) impacts to be determined. Procurement benefits tied to US$7.2 billion CAPEX for Project. Total wages, benefits relatively smaller when compared to land-based mines.	No negative livelihood impacts, including none potentially relating to tourism, shipping, fishing. No +/- livelihood risks or impacts from offshore or onshore facilities.	Expanding existing or developing new conventional mines, and planned and unplanned riverine and coastal discharges, or dam failures, will generate related +/- livelihood impacts, including in places with less stringent requirements and controls. Supply shortage for cobalt may magnify artisanal mining and risk of child labor, and appears to be undermining "no

Category	With Project	No Project	Counterfactual
	Ecosystem services social impacts require further analysis, considering also scale of Pacific Ocean.		child labor" certification systems[59] in the cobalt supply chain in the African Great Lakes region, including the DR Congo.
Health and Safety	H&S risks need to be managed. The Project activities to date have an exemplary record: no (0) fatalities, no (0) lost time incidents from 2018 to 2021. No child labor risks.	No risks related to safety at sea, or on shore. No risk to community health & safety for onshore operations (ports, smelters).	The skilled professionals who would be employed by or contractors to the Project will likely move on to other projects/operations. New or expanding land-based mining projects would have relatively higher numbers of workers and community health & safety risks (incl. child labor risks) compared to NORI-D's largely robotic mining activities.
Marine Scientific knowledge	Ongoing $100 multi-year deep-sea research program involving leading research institutions retaining academic freedom, including freedom to publish results. Scientific knowledge generated, published.	Curtailment or cessation of industry-supported deep-sea research in largely inaccessible areas and depths.	Research may adjust, slow down, and/or shift to other areas and activities, including in national exclusive economic zones which will not have the multilateral distribution of the ISA.
Capacity Building	On-going capacity building and, training, valued particularly highly by Small Islands Developing States.	No ISA/DSM related capacity building/training initiatives. Capacity building mandate of the ISA will remain underfunded and underutilized.	Capacity building mandate of the ISA will remain underfunded and underutilized.
Climate Change	Tapping into the world's largest undeveloped nickel deposit will help address the surge in demand for battery metals. Diverse sources of metals will be needed for the transition to low carbon economies. Lower GHG intensive mining, products.	Growing deficit of battery metals, resulting in increasing costs for critical metals, adding barriers to transitioning to low-carbon economy, and mitigating the Climate Change crisis. Entrenching dependencies, geopolitical and supply chain risks.	Demand for battery metals met from other sources, with their own +/- impacts, with potential delays and increased costs to consumers. Supply barriers continue for foreseeable future, delaying more rapid response to Climate Change crisis.

[59] Global Witness, 2022. The ITSCI Laundromat, How a due diligence scheme appears to launder conflict minerals. April 2022

Category	With Project	No Project	Counterfactual
	Reducing additional stress on water-scarce regions for ore extraction. A Life Cycle Assessment (LCA) study shows that, when compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the nickel produced from NORI-D exhibits approximately 94%, 78% and 68% lower Global Warming Potential respectively[60].	Continued reliance on high GHG intensity battery metals production.	Transitioning transport sector to EV potentially slowed down, including due to escalating cost, resulting in additional GHG emissions. Entrenching dependencies, geopolitical and supply chain risks. Continued and growing reliance on high GHG and water intensity battery metals production.

Source: Prizma and NORI

[60] Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022 -* BMI LCA Results are undergoing third party verification

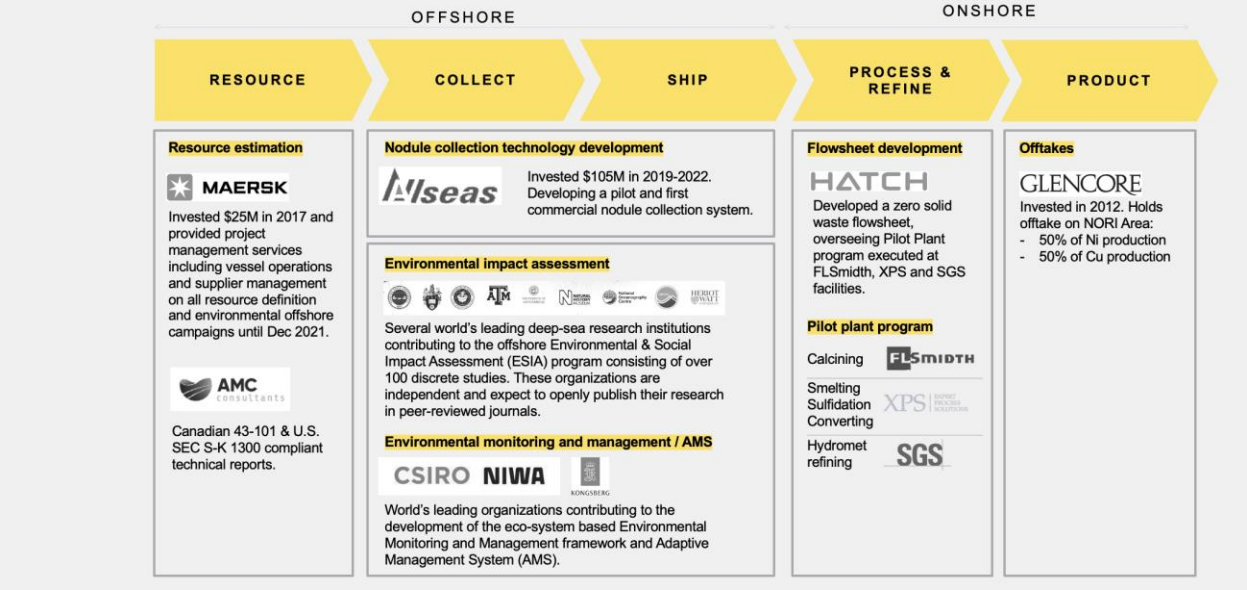
D. Onshore Infrastructure

As noted in Section IV.B above, the characteristics of deep-sea nodules, their collection and near-zero waste processing, does not require the construction of tailings storage facilities. However, other shore/land-based processing facilities will still be required. This may include, for example, construction of a dedicated hydro- and pyro-metallurgical processing facility, or use of spare capacity or modification of existing processing facilities.

As common to mining operations at the feasibility and impact assessment stage, NORI is still studying its strategic options (and related alternatives) for its significant onshore facilities for Project Zero and Project One.

The Project's options include leveraging its existing partnerships identified below.

Figure 9: Leveraging business and other partnerships for offshore and onshore activities



Source: TMC

In March 2022, TMC announced[61] that it entered into Business Collaboration Memorandum of Understanding with Epsilon Carbon, India's leading producer of graphite materials for lithium-ion battery anodes with ambitions to enter cathode material production, to complete a pre-feasibility study for the world's first commercial polymetallic nodule processing plant in India. Epsilon Carbon intends to deliver a pre-feasibility report for a plant in India powered by renewables and with a targeted processing capacity of 1.3 million tonnes per annum of wet nodules.

[61] https://investors.metals.co/news-releases/news-release-details/metals-company-enters-business-collaboration-mou-epsilon-carbon

In addition to exploring plant sites based on proximity to markets for byproducts, site selection is also expected to be based on access or proximity to renewable energy.

Table 6: Example of preferred options for selection of port facilities

Criteria	Preferences
Access to Power	Access to low carbon options, preferably hydroelectric
Distance to RKEF	Minimize need for haul trucks or rail transport
Material handling	Capability to load/unload shipments and store materials
Port size	Port size must be considered to determine size of ships that can deliver nodules
Access to markets	Proximity to markets for by-products
Geopolitical	Government partnership opportunities
ESG	Alignment with TMC's ESG values and commitments

VI. Regulatory Context

A. UNCLOS & ISA

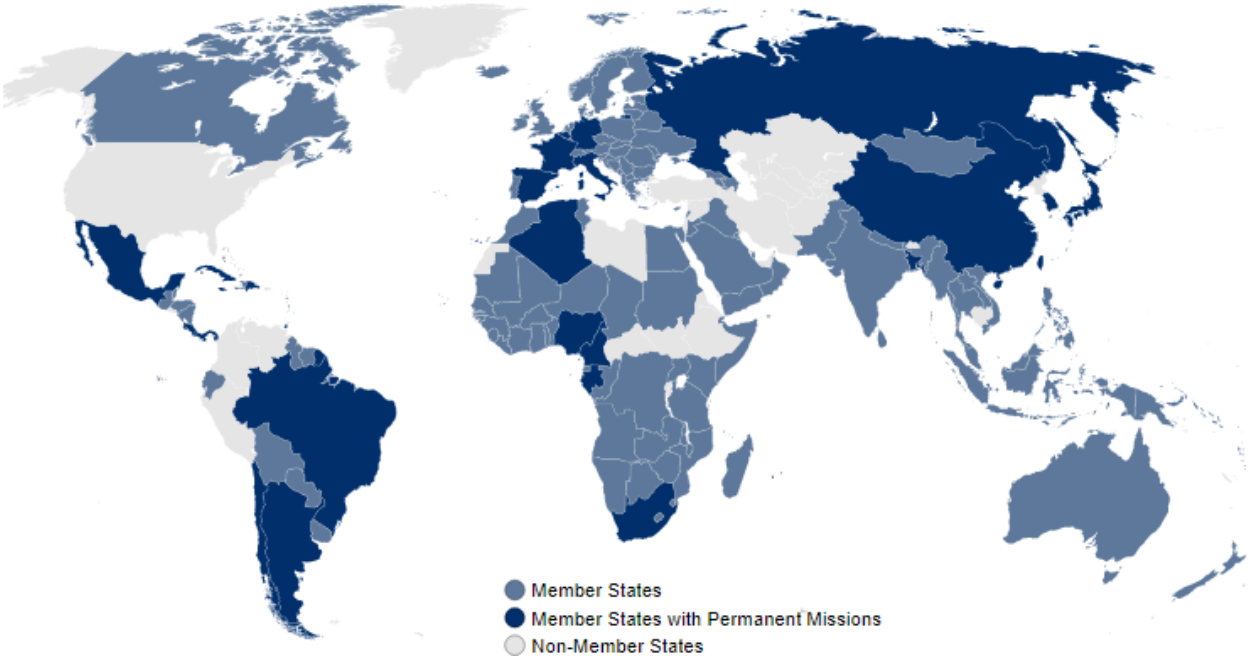
Exploration and exploitation of seabed minerals in international waters (The Areas Beyond National Jurisdiction – often referred to as "The Area") is regulated by the International Seabed Authority (ISA). It is an autonomous intergovernmental organization enabled by the 1994 Agreement Relating to the Implementation of the United Nations Convention on the Law of the Sea (UNCLOS) (the 1994 Agreement). The ISA provides the first example of developing an international regulatory regime before an industry has started. The presence of deep-sea minerals was one of the major drivers of establishing international ocean laws and regulations, dating back to the 1950s and culminating in UNCLOS.

The ISA organizes and controls all mineral-resources-related activities in "The Area" (where UNCLOS applies) for the benefit of humankind. This also means that the ISA does not organize, regulate or control onshore facilities or activities which fall within the jurisdiction of their host countries.

The ISA, headquartered in Jamaica, is financed and governed by 167 Member States, including all Pacific Small Island Developing States (see below), and the European Union.

As of 5 August 2022, ISA has 99 observers, including 37 non-governmental organizations (NGOs), which are listed in Annex 4, speaking to ISA's efforts aimed at transparency and engagement.

Image 3: Member States of the International Seabed Authority



Source: ISA at https://www.isa.org.jm/index.php/member-states

Box 1: The Common Heritage of Humankind (CHH)

The Common Heritage of Humankind (CHH) principle represents the notion that certain global commons or elements regarded as beneficial to humanity as a whole should not be unilaterally exploited by individual states or their nationals, nor by corporations or other entities, but rather should be exploited under an international arrangement or regime for the benefit of humankind as a whole. The application of the CHH concept is particularly important as our population and use of resources grow, and the world faces significant challenges, such as climate change.

This CHH principle is contained in UNCLOS[1], which governs the Area – the seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction – and embraces the goal to contribute to the realization of a just and equitable international economic order that takes into account the interests and needs of humanity as a whole and, in particular, the special interests and needs of developing countries.

While there is no concise fully agreed upon definition of CHH, there are core elements of how to manage global commons and these are used in UNCLOS.

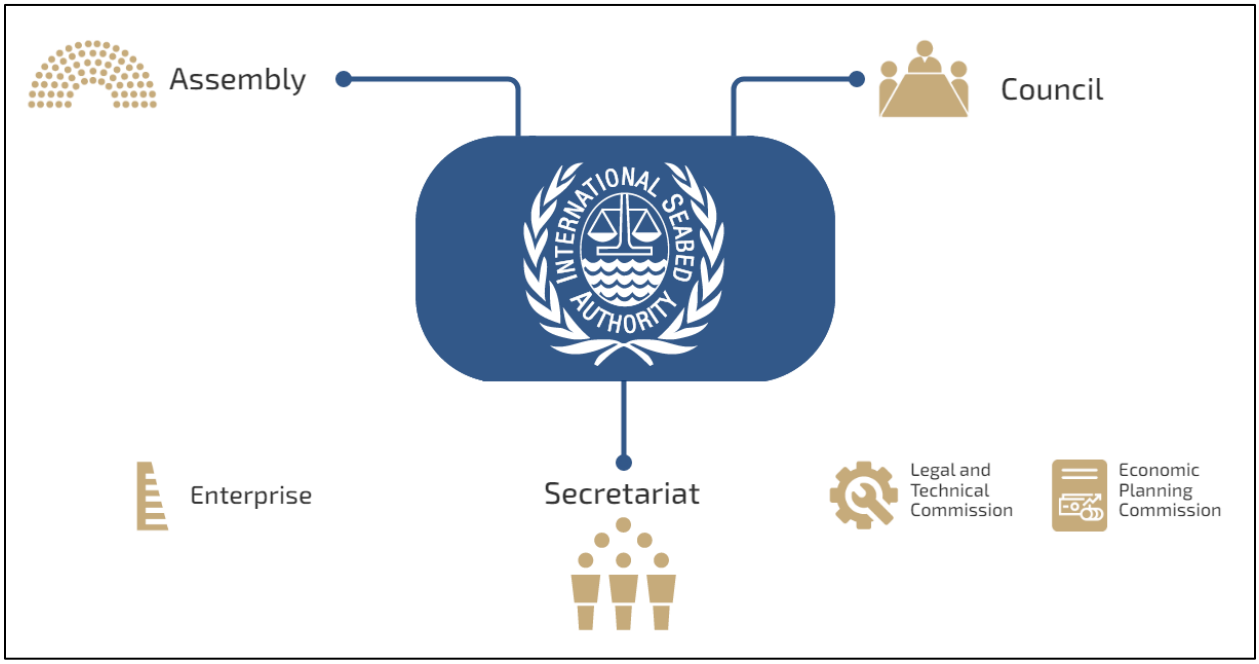
- **Non-appropriation**: No state or person can claim sovereignty or sovereign rights over any area deemed CHH or its resources.
- **Cooperative management**: The use of CHH shall be carried out in accordance with a system of cooperative management for the common good.
- **Sharing of benefits**: There will be an active and equitable sharing of benefits (including financial, technological, and scientific) derived from activities in an area deemed CHH.
- **Peaceful purposes**: The use of resources deemed CHH are reserved for non-military uses.

Source: modified from Oxford Bibliographies

B. Key ISA Organs

The key organs of the ISA are depicted in Figure 10, which is followed by a brief summary of their roles.

Figure 10: The Organs of the International Seabed Authority



Source: ISA, accessed December 6, 2022

Assembly - it comprises all members (167 States and the European Union), serves as the supreme organ, and establishes the general policies of the ISA. The power of the Assembly includes election of the members of the Council (see further below) and other bodies, as well as appointing the Secretary-General, sets ISA's two-year budgets, the rates by which Members contribute towards the budget using the assessment scale established by the United Nations for that body's activities. Following adoption by the Council, the Assembly approves the rules, regulations and procedures that ISA, including those which govern prospecting, exploration and exploitation in the Area.

Council – serves as the executive organ of the ISA, comprises 36 members elected by the Assembly, and stablishes specific policies in conformity with UNCLOS and the general policies set by the Assembly. The Council supervises and coordinates implementation of the regime established by UNCLOS to promote and regulate exploration for and exploitation of deep-sea minerals. The Council's tasks include approval of contract applications, overseeing implementation of the contracts, and establishing environmental and other standards. In cases where an environmental threat arises from seabed activities, the Council may issue emergency orders to prevent harm, including orders to suspend or adjust operations. The Council will also assume additional responsibilities once deep-sea mining commences, including action (including compensation) to protect land-based mineral producers in the developing countries from adverse economic effects of seabed production.

Secretariat – is the third principal organ of the ISA, headed by the Secretary General. The Secretariat's function includes implementation of the work programs and policies laid down by the

other principal organs and their subsidiary bodies, ensuring compliance with plans of work for exploration and exploitation contracts. The Secretariat includes an Office of Environmental Management and Mineral Resources (OEMMR), which provides scientific and technical input into the development and implementation of the rules, regulations and procedures for the conduct of activities in the Area. The OEMMR also supports the development and implementation of regional environmental management plans, environmental impact assessment and environmental monitoring, and the development of environmental standards and guidelines.

Legal and Technical Commission (LTC) – it currently comprises 30 members elected by the Council for a 5-year period. During the ISA's 27th session, a council decision was announcing relating to members of the elected members to the LTC for the new five-year period of 2023-2027[62]. 41 LTC members were selected for this new period, will commence in January 2023. The LTC reviews applications for plans of work, supervision of exploration or mining activities, development of environmental management plans, assessment of the environmental implications of activities in the Area, formulate and keep under review the rules, regulations, and procedures in relation to activities in the Area, and make recommendations to the Council on all matters relating to exploration and exploitation of non-living marine resources. In March 2019, the LTC submitted the Draft regulations on exploration of mineral resources in the Area to the Council for its consideration. The LTC is currently developing standards/guidelines for the exploitation activities in the area, as a priority matter.

C. Pacific Small Island Developing States

The United Nations recognizes 42 Small Island Developing States (SIDS). These are considered vulnerable due to their isolation, exposure to climate risks, and dependency on imports[63]. A sub-group of SIDS, the Pacific Small Island Developing States (PSIDS) are all voting members of the ISA (see Table 7). This means that they are informed, can directly represent their interests (including those related to intangible cultural heritage associated with the Pacific Ocean), and participate in ISA's governance structures.

Several PSIDS have become sponsors under the ISA regime for exploration activities in the Area. As shown in Table 5, two PSIDS have nominated representatives to serve as independent experts at ISA's Legal and Technical Commission (LTC).

In addition, several PSIDS, such as Cook Islands, Fiji, and Papua New Guinea, are also engaged in deep-sea mining exploration activities within their own Exclusive Economic Zones (EEZ), which are not subject to ISA's multilateral regulatory regime.

[62] ISBA_27_C_41_Add_1.pdf (isa.org.jm)
[63] https://www.un.org/ohrlls/content/small-island-developing-states

Table 7: All Pacific Small Island Developing States are ISA Members

PSIDS	ISA Member	ISA Legal and Technical Commission (LTC) 2023-2027[64]	Sponsorship in ABNJ
Cook Islands	Yes		Cook Islands Investment Corporation
Micronesia	Yes		
Fiji	Yes	Yes	
Kiribati	Yes		Marawa Research and Exploration Limited
Nauru	Yes		Nauru Ocean Resources Inc (NORI)
Niue	Yes		
Palau	Yes		
Papua New Guinea	Yes		
Marshall Islands	Yes		
Samoa	Yes		
Solomon Islands	Yes		
Tonga	Yes	Yes	Tonga Offshore Mining Limited (TOML)
Tuvalu	Yes		
Vanuatu	Yes		

Sources: https://www.isa.org.jm/member-states and LTC membership: https://www.isa.org.jm/index.php/authority/legal-and-technical-commission (accessed December 5, 2022); EEZ – Exclusive Economic Zone, ABNJ – Areas Beyond National Jurisdiction (subject ISA's regulatory regime), PSIDS - Pacific Small Island Developing States, ISA LTC – ISA's Legal and Technical Commission (30 members)

D. Land-Based Producer States

With reference to UNCLOS Articles 150 (h) and 1 (3), the 2020 Lapteva *et al.*'s study[65] produced for the ISA indicates that UNCLOS requires that developing States must be protected "from adverse effects on their economies or on their export earnings resulting from a reduction in price of an affected mineral, or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area…". The study concluded that, for all demand growth scenarios considered for copper, nickel, and cobalt, the production by even 12 contractors would not exceed the expected demand growth. However, production of six contractors would exceed the demand growth scenarios for manganese. The same study identified a list of the Potentially Vulnerable Land-Based Producer States. Prizma's review of this list shows that, with two exceptions (Eritrea and Peru), all identified States are members of the ISA and, therefore, also involved in its governance (see Table 8)[66].

[64] PSIDS were also represented during the LTC membership period of 2017-2022
[65] Lapteva et al, 2020. Study of the Potential Impact of Polymetallic Nodules Production from the Area on the Economies of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affected, Advanced unedited version, dated May 12, 2020
[66] ISA membership source: https://www.isa.org.jm/member -states (accessed 5/12/2022)

Table 8: Land-Based Producer States potentially impacted by PMN production in the Area

Country	Products' share in export revenues	Products' share in GDP (%)	ISA Member
Exporters of copper products			
Zambia	56.1	18.7	Yes
DR Congo	55	11.1	Yes
Eritrea	50	5.6	No
Chile	48.9	12.8	Yes
Laos	34.4	7.7	Yes
Mongolia	26	15.9	Yes
Peru	25.8	5.1	No
Exporters of nickel products			
Madagascar	20.3	3.7	Yes
Zimbabwe	15.6	3.1	Yes
Exporters of cobalt products			
DR Congo	24.3	4.8	Yes
Exporters of manganese products			
Gabon	21.9	5	Yes
Cumulative effect of exports of all affected metals			
Mauritania	12	4.8	Yes
Namibia	11.4	4.9	Yes
Papua New Guinea	10.6	4.3	Yes

Source: See Table II. Countries exporting copper, nickel, cobalt and manganese products which are likely to be most seriously affected by seabed production, in Lapteva et al, 2020. Study of the Potential Impact of Polymetallic Nodules Production from the Area on the Economies of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affected, Advanced unedited version, dated May 12, 2020; ISA membership source: https://www.isa.org.jm/member-states (accessed 5/12/2022)

E. ISA's Legal & Technical Commission

ISA's Legal and Technical Commission (LTC) is an organ of the Council of ISA. It consists of 30 members who are elected by the Council for a period of 5 years from among the candidates nominated by the member States. The LTC will increase in size to 41 members for the period of 2023-2027. LTC's functions includes supervision of exploration or mining activities, developing environmental

management plans, assessing the environmental implications of activities in the Area, formulating, and reviewing the rules, regulations, and procedures in relation to activities in the Area, and making recommendations to the Council on all matters relating to exploration and exploitation of non-living marine resources (such as PMN). As shown in Table 7, the active participation of the Pacific Small Island Developing States includes the election of two of their representatives to the LTC.

F. ISA's Regional Environmental Management Plans

As part of its mandate, the ISA has developed and periodically reviews regional environmental management plans (REMPS) – including for the CCZ[67] - to ensure the protection of the marine environment. The ISA lists the objectives of these REMPS as follows:

- Provide the relevant organs of ISA, as well as contractors and their sponsoring States, with proactive area-based and other management tools to support informed decision-making processes that balance resource development with conservation.
- Provide ISA with a clear and consistent mechanism to identify areas thought to be representative of the full range of habitats, biodiversity and ecosystem structures and functions within the relevant management area.
- Provide those areas with appropriate levels of protection.
- Help ISA meet globally agreed goals and targets, such as the ones set out by the 2030 Agenda and in particular Sustainable Development Goal 14 (Life below water).

For the CCZ, following a workshop on the CCZ biodiversity synthesis[68], the ISA expanded the designated Areas of Particular Environmental Interest (APEI), which are effectively "no mining areas", from 9 to 13 in December 2021 (see Figure 3). The APEI's nearest to NORI's contract areas are also shown in Figure 3.

G. ISA Exploration Contracts

The ISA grants contracts to sovereign states, state enterprises, or to private contractors who are sponsored by one or more sovereign states. The Enterprise, also an ISA organ (not fully operational at this time), may also carry out activities, such as transporting, processing, and marketing of minerals recovered from it, on behalf of all Members of ISA and subject to the directives and control of the Council.

The ISA requires that a contractor must obtain and maintain sponsorship by one or more of the Member States of the ISA (and signatory to UNCLOS), and such nation(s) must maintain effective supervision and regulatory control over such a sponsored contractor.

The ISA Member States which have sponsored exploration activities in the CCZ include Belgium, Bulgaria, Cook Islands, Cuba, China, Czech Republic, France, Germany, Jamaica, Japan, Kiribati, Nauru (which is NORI's Sponsor), Poland, Russian Federation, Singapore, Slovakia, Tonga, United Kingdom of Great Britain, and Northern Ireland.

[67] https://isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone
[68] https://isa.org.jm/event/deep-ccz-biodiversity-synthesis-workshop

The ISA has issued a total of 19 polymetallic nodule exploration contracts covering approximately 1.28 million km^2, or 0.4 percent of the global seafloor. Of these contracts, 17 are located in the CCZ, which has a width comparable to the continental USA. Three of the contracts in the CCZ are affiliated with TMC, which includes NORI.

H. ISA's Regulatory Regime

The "Mining Code" refers to the whole of the comprehensive set of rules, regulations and procedures issued by ISA to regulate prospecting, exploration, and exploitation of marine minerals in the international seabed Area, or the "Area" (defined as the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction). According to the ISA[69,70], exploration regulations covering the prospecting and exploration for polymetallic nodules was initially adopted in 2000 and revised in 2013. In 2014, the ISA began to develop regulations to govern the exploitation of mineral resources in the Area with a series of scoping studies. The aim of the exploitation regulations is to balance economic needs with rigorous environmental protection.

Once in place, the regulations will require any entity planning to undertake activities in the international seabed area to abide by stringent environmental requirements. The regime to be established also requires a portion of the financial rewards and other economic benefits from mining to be paid to the ISA, most of which will then be shared according to "equitable sharing criteria" (see below). Draft exploitation regulations have been prepared following a multi-year, transparent process, and involving public consultations. The negotiations to finalize the regulatory regime are on-going.

The ISA's exploitation regulations was expected to be finalized by July 2020. Due to COVID-19 disruptions, this date shifted to July 2023 after Nauru utilized Article 15 of the 1994 Agreement. With regards to (environmental and) social impacts and benefits, the draft regulations refer to, inter alia, the IFC Performance Standards on Environmental and Social Sustainability, and the Equator Principles, which are benchmarks for determining, assessing, and managing environmental and social risk in projects. It is expected that the ISA will carefully consider and balance environmental, social, and economic effects of each exploitation application, also taking into account stakeholder input, before making a decision.

A series of other relevant conventions, standards and guidelines focused more on the marine aspects of the Project are tabulated in Annex 3. The evolving regulatory regime of the ISA includes rules and procedures for managing future nodule collection revenues and economic contribution. This includes royalties and other payments made to the ISA by operators working under exploitation contracts. The ISA is also evaluating different formulas for equitable sharing of financial and other economic benefits generated from the Area. Relevant aspects for this SIA Scoping Document are described further below.

[69] https://www.isa.org.jm/mining-code

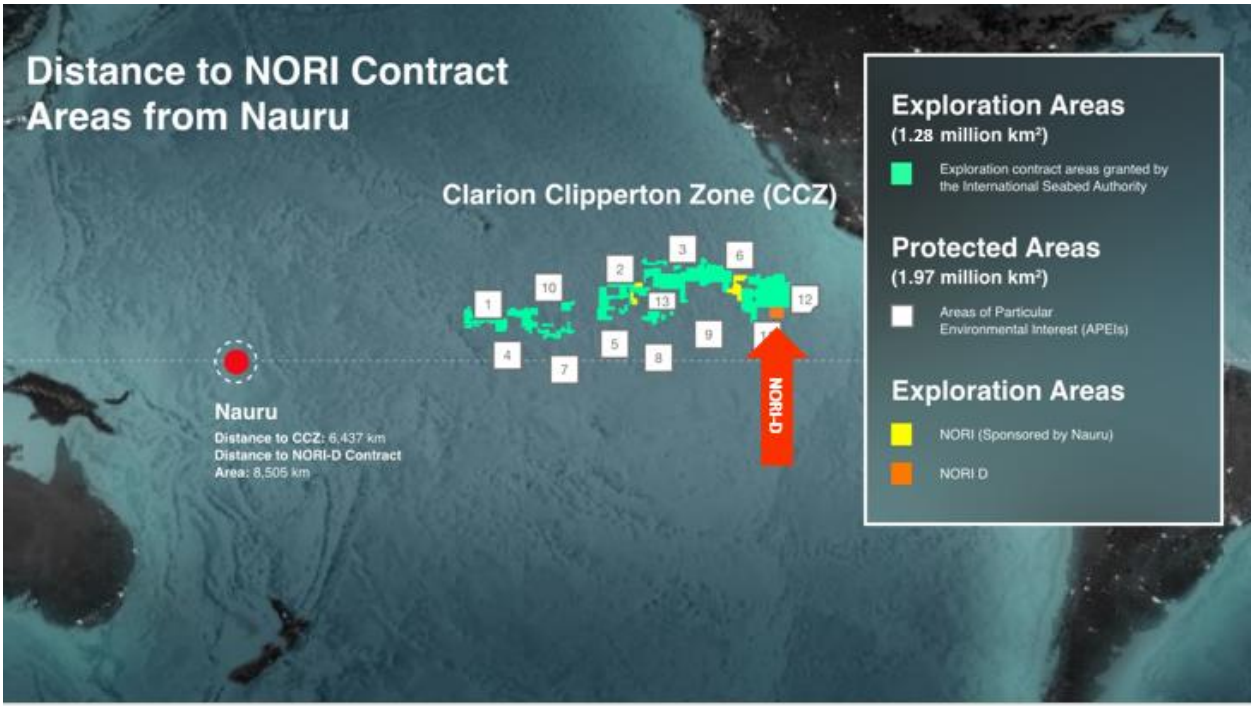
[70] ISA, 2021. Status of the draft regulations on exploitation of mineral resources in the Area and proposed road map for 2022 and 2023, Report of the Secretary-General, available here: https://isa.org.jm/files/files/documents/ISBA_26_C_44-2112033E.pdf

I. The Republic of Nauru

Nauru is the ISA Member State Sponsor of NORI, and a Project beneficiary, as described further below. This island nation is the first sponsoring state to access the land bank created by the ISA to provide developing states with the opportunity to participate in this industry. Nauru views PMN as an opportunity to diversify its economy and contribute to the transition to clean energy.

Nauru is the world's smallest island country (21 square kilometers), has a population of approximately 12,500, and is located northeast of Australia in southeastern Micronesia in the Central Pacific Ocean. As illustrated in Figure 11, Nauru is located at a distance of approximately 6,500 km to the CCZ and over 8,500 km from the NORI-D Project. There will be no Project-related nodule collection activities, processing, or infrastructure at or near Nauru.

Figure 11: Location of Nauru



Source: TMC, Map identifies Protected Areas within the CCZ and designated by the ISA. Nearest other protected area outside of the CCZ is Clarion Island. It is located at a distance of approximately 700 km from NORI-D and is part of Mexico's *Archipiélago de Revillagigedo*, a UNESCO World Heritage Site

According to its government publications[71], Nauru's 2021-22 budget recognized expected revenues of AUS$244.1 million (approximately US$ 183.5 million) and expenditure of AUS$244.0 million (approximately US$153.5 at 3 Nov 2022 foreign exchange rates). Approximately 25 percent of Nauru's

[71] https://naurufinance.info/2021-22-budget/?msclkid=6e14ed72b05811eca30e683bf6364e6f accessed March 30, 2022

revenues are related to fisheries. Nauru also received non-tax revenues, such as Hosting Fees to accommodate refugees on behalf of Australia (approximately US$25.6 million projected for 2020-2021).

According to the Green Climate Fund, because of its isolated position in the Pacific, Nauru depends significantly on its port for supplies of food, energy, and most other essentials. However, the port is expected to become inoperable for longer periods every year due to the impact of sea level rise and increased intensity of climate-related events such as strong storms and cyclones. Supported by grants from the Green Climate Fund (US$26.91 million), the Asian Development Bank and related trust funds (US$24.30 million), the Government of Australia (US$14.08 million), and additional parallel financing by the Government of Japan to provide port equipment, a climate-resilient port development is underway at Nauru. This development is expected to be completed by mid-2022[72].

Other grant-funded programs include the 2021 Asian Development Bank's approval of a $5 million project readiness facility to finance the assessments, planning, and capacity building for the proposed Nauru Sustainable Urban Development Project. The ensuing project is expected to help improve household water supply, sanitation, and solid waste management[73].

In 2015, Nauru enacted the International Seabed Minerals Act[74]. It established the Nauru Seabed Minerals Authority (NSMA) to lead and administer Nauru's sponsorship of activities carried out in the Area by companies sponsored by Nauru. To manage future revenues related to deep-sea mining, Nauru also established its Seabed Minerals Fund. In 2015, Nauru also established the Nauru International Trust Fund[75] to contribute to the long-term budgetary self-reliance of Nauru. The aim was to have a trust fund provide supplementary funds to the budget as of 2030, mainly to replace dwindling phosphate royalty revenues. As of 30 June 2020, the value of the fund was $140 million, an increase of $28 million over the year[76].

In relation to the NORI-D Project, Nauru, the NSMA, and NORI entered into a sponsorship agreement in 2017 formalizing certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI contract areas. Upon reaching a minimum recovery level within the exploitation contract area, NORI will provide a payment to Nauru linked to nodules recovered from the exploitation contract area. In addition, NORI pays an annual administration fee to cover costs incurred by Nauru administering the Agreement. This agreement is subject to periodic review and the payable fees are indexed to adjust for inflation.

NORI-D integrated project is estimated to be USD 9.2 billion in taxes over lifetime of the project. A share is attributable to offshore nodule collection and transport.

J. IFC Performance Standards

Based on the Project Description and other information reviewed, Prizma's preliminary screening categorized the NORI-D Project to be an "A-level" project in terms of the IFC Performance Standards

[72] 48480-003: Sustainable and Climate-Resilient Connectivity Project (formerly Port Development Project) | Asian Development Bank (adb.org)
[73] https://www.adb.org/sites/default/files/publication/27748/nau-2021.pdf
[74] https://www.isa.org.jm/files/documents/EN/NatLeg/Nauru_ISM.pdf
[75] https://naurufinance.info/intergenerational-trust-fund/
[76] https://naurufinance.info/wp-content/uploads/2020/07/background_web_2019_itfn_with_grey_background.pdf

and Equator Principles. This is a category typically assigned to new mining projects, or many other types of offshore energy or renewable power projects. A category "A" designation means that the Project is deemed to feature potentially significant adverse environmental and social risks and/or impacts that may be diverse, irreversible, or unprecedented, and for which an ESIA-type study is required.

Prizma's preliminary screening of the Project also suggests that while all Performance Standards may be applicable to this Project and/or certain– currently undefined – future onshore components, the Project may have impacts which must be managed in a manner consistent with the following IFC Performance Standards:

- **PS 1** - Assessment and Management of Environmental and Social Risks and Impacts
- **PS 2** - Labor and Working Conditions
- **PS 3** - Resource Efficiency and Pollution Prevention
- **PS 4** - Community Health, Safety and Security (mainly for onshore facilities)
- **PS 6** - Biodiversity Conservation and Sustainable Management of Living Natural Resources

A justification why, using a conventional interpretation, PS 5, PS 7, and PS 8 are not deemed applicable – or not at this time - is provided below.

- **PS 5 - Land Acquisition and Involuntary Resettlement**

  Affected Communities in the context of mining projects may include those affected by economic dislocation or physical resettlement, or affected by significant impacts from, for example, emissions or effluents. Located in the CCZ, in the Pacific Ocean, approximately 700 km from the Clarion Island, and approximately 1,700 km from Mexico's mainland, there are no residents, landowners, or users at the nodule collection site. Considering distances involved and, for example, dissipation effects they contribute to, it is reasonable to assume that potential environmental effects of NORI-D in the CCZ will not likely generate significant adverse livelihood effects. This means that Performance Standard 5 is not deemed to be triggered at this time. However, the applicability of PS 5 will need to be revisited once further data is available, including data relating to effects from, for example, sediment plumes, and siting decisions relating to onshore facilities have been made.

- **PS 7 - Indigenous Peoples**

  The IFC Performance Standard 7 notes that "Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-Indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases."

  Prizma notes that a 2016 UNESCO study[77] underlines the intrinsic relationship that many Indigenous Peoples have with the oceans, seabed, and environs. Pacific islanders are

[77] Toki, Valmaine, 2016. Study on the relationship between Indigenous peoples and the Pacific Ocean, UN Permanent Forum on Indigenous Issues at https://digitallibrary.un.org/record/822537?ln=en

described as guardians or custodians of the oceans. Some view deep-sea mining in the context of nuclear testing, driftnet fishing and bottom trawling, and marine pollution, and indicate a need for Free, Prior, and Informed Consent (FPIC)[78]. The literature also highlights that Indigenous Peoples (and other local communities) have been underrepresented in the debate about the governance of oceans and their natural resources beyond national jurisdiction, and ability to inform strategies for conservation, sustainable and equitable use of marine species in general[79].

Prizma also notes that the potentially most vulnerable Pacific Small Island Developing States (PSIDS) are voting members of the ISA. This means that they participate in ISA's governance, shape and determine the applicable regulatory regime, and will determine if an application for exploitation in the Area should be approved or declined. Some PSIDs are also Sponsors of activities in the Area (such as Nauru sponsoring NORI, and being a beneficiary) and/or pursue deep-sea mining within their Exclusive Economic Zones (EEZ, meaning within their own jurisdiction). The latter includes the Cook Islands. It sponsors activities within the CCZ[80] and, at the same time, pursues DSM opportunities within their sovereign EEZ[81]. Conversely, Tuvalu, also a PSIDS, recently rescinded its sponsorship for deep-sea mining exploration in the CCZ[82].

Also, some Indigenous Peoples, including some based in Hawaii (USA is an Observer at the ISA and not a member), Mexico or Canada (both ISA members), may not feel fully represented at the ISA, even though the ISA's provides for public participation opportunities which are open to all interested parties. In addition, the ISA, which emerged pursuant to the UNCLOS convention, maintains a structure which includes 99 observers, including 30 observer States (such as the USA), 32 intergovernmental organizations (including numerous UN agencies and multilateral development banks), and 37 non-governmental organizations (NGOs)[83].

Prizma's preliminary screening, using a conventional application (interpretation) of the IFC PS 7, takes into account that the Project's nodule collection area is located offshore, approximately 700 km from the Clarion Island (uninhabited except for a naval base[84]) and approximately 1,700 km from Mexico's mainland. This suggests that the NORI-D contract area does not feature the presence of Indigenous People or their territories, and currently available information does not suggest transformation, encroachment, and significant degradation of their lands and resources. These factors indicate that PS 7 (and the related Free, Prior, and Informed Consent (FPIC) requirements applicable under certain circumstances) is not triggered by the Project at this time.

However, the applicability of PS 7 will need to be revisited and validated once further data will become available relating to, for example, the effect of sediment plumes or other impacts which will be assessed during the pilot Collector Test and the Project's ESIA, and/or siting decisions for onshore facilities. NORI-D's engagement and planned public consultation is

[78] https://www.pacificblueline.org/pacific-blue-line-statement
[79] See, for example, Marjo K. Vierrosa, et al., 2020. Considering Indigenous Peoples and local communities in governance of the global ocean commons. Marine Policy, Volume 119, September 2020, 104039 at https://www.sciencedirect.com/science/article/pii/S0308597X19309212
[80] https://isa.org.jm/files/files/documents/Public%20information%20on%20contracts%20CIIC.pdf
[81] https://www.sbma.gov.ck/phases-of-sbm-activity
[82] https://dsmobserver.com/2022/05/tuvalu-cancels-its-sponsorship-the-role-of-international-law/
[83] https://www.isa.org.jm/index.php/observers
[84] https://whc.unesco.org/en/list/1510/multiple=1&unique_number=2102

designed to be inclusive and encourage the participation of Indigenous Peoples, Pacific islanders, and other interested stakeholders.

- **PS 8 - Cultural Heritage**

  The intrinsic relationship that Indigenous Peoples have with the oceans and the participation of PSIDS as members of the ISA and its governance is noted further above. Prizma's preliminary screening of the Project suggests that, as commonly interpreted and applied, IFC PS 8 does not appear to be triggered by the NORI-D's off-shore activities in the CCZ. Here, the Project is not expected to affect cultural heritage, including cultural resources, knowledge, innovations and/or practices of local communities embodying traditional lifestyles, nor plans to commercialize intangible cultural heritage. The applicability of PS 8, including in relation to future shore-based facilities, will need to be reviewed once their physical locations have been identified.

  ISA's regulations require immediate notification if human remains and objects and sites of an archaeological or historical nature are identified in the Area (Regulations 8 and 35)[85]. Also, the ISA, which defines mineral resources in the Area as "Common Heritage of Humankind" has already conceptually defined approaches for equitable sharing of economic and other benefits derived from deep-seabed mining[86].

[85] https://isa.org.jm/files/files/documents/isba-19c-17_0.pdf
[86] See ISA Policy Brief 01/2022 on Equitable sharing of financial and other economic benefits from deep-seabed mining

VII. Key Stakeholders

NORI defines its stakeholders as any interested individual or organization. NORI is committed to robust and representative stakeholder and community participation, as well as inclusive and transparent sharing of information. NORI acknowledges the dynamic nature of its stakeholder landscape (and that of deep-sea mining more generally). Stakeholder mapping and the overall engagement plan will be regularly reviewed to ensure that they are up to date, and engagement methods and strategies are fit for purpose.

In line with these commitments, NORI adopted a phased approach to the SIA process, including a Scoping process to engage and consult stakeholders, so that they can contribute to the design of the TOR and help shape the SIA study (see also Figure 1 in Section I), which will also be subject to its own engagement and consultation.

The following IFC principles of engagement[87] will also be applied during the life of the Project and will serve as the basis for stakeholder engagement:

- Provide meaningful information in a format and language that is readily understandable and tailored to the needs of the target stakeholder group(s);
- Provide information in advance of consultation activities and decision-making;
- Disseminate information in ways and locations that make it easy for stakeholders to access it;
- Respect local traditions, languages, timeframes, and decision-making processes;
- Establish two-way dialogue that gives both sides the opportunity to exchange views and information to listen and to have their issues heard and addressed;
- Seek inclusiveness in representation of views, including women, vulnerable and minorities;
- Adopt processes free of manipulation interference, intimidation, or coercion and free of charge for participation;
- Develop clear mechanisms for receiving, documenting, and responding to people's concerns, suggestions, and grievances; and
- Incorporate feedback into project or program design and report back to stakeholders.

With these principles in mind, the overall objective of the Project's stakeholder engagement activities is to keep stakeholders informed with respect to their specific interests and maintain stakeholder confidence and trust in the Project and its activities through open, informative, inclusive, and timely communications.

The expectation is that this will be achieved by building on the relationships established during the SIA phase and making appropriate adjustments that are consistent with the changing Project status, including Project-related activities, affected communities, stakeholder perceptions and interests, and reporting needs.

[87] See Stakeholder Engagement: A Good Practice Handbook for Companies, Doing Business in Emerging Markets, International Finance Corporation, 2007

A draft Stakeholder Engagement Plan (sometimes also referred to as Public Consultation and Disclosure Plan or PCDP) will be included as an annex to the Terms of Reference or be part of the draft SIA, which will be subject to public consultation.

Table 9: Examples of stakeholder segments which will be considered in the SIA

Segment	Definition or description
Stakeholders[1a, b]	ISA: "Stakeholder" means a natural or juristic person or an association of persons with an interest of any kind in, or who may be affected by, the proposed or existing Exploitation activities under a Plan of Work in the Area, or who has relevant information or expertise. IFC: Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses.
Affected Communities[2]	Are local communities within the Project's area of influence, directly affected by the Project.
Pacific Small Island Developing States	This group comprises Cook Islands, Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. All are members of the ISA.
Developing Land-Based Producer States (DLBPS) [88]	The ISA[3] is mandated to allocate revenues to establish an Economic Assistance Fund to assist developing countries which suffer serious adverse effects on their export earnings or economies resulting from a reduction in the price of an affected mineral or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area.

Source: 1a – ISA's Draft regulations on exploitation of mineral resources in the Area (ISBA/25/C/WP.1), 1b - IFC Performance Standards on Environmental and Social Sustainability (2012), Stakeholder Engagement: A Good Practice Handbook for Companies, 2 – Equator Principles (EP4); 3 - ISA Policy Brief 01/2022 om Equitable Sharing of Financial and Other Economic Benefits from Deep Sea Mining.

A broader list of key stakeholders to consider has been suggested for deep-sea mining projects by Steven Katona *et al*[89], which is presented in Table 9. The identified listing essentially comprises the entire human population around the world. This list will be further reviewed to arrive at a practicable engagement and consultation strategy for the Project, prioritizing the potentially most significantly and adversely affected stakeholders, and any associated vulnerable groups.

[88] See also Table 8 above

[89] Steven Katona, et al, 2021. Ethical opportunities in deep-sea collection of polymetallic nodules from the Clarion-Clipperton Zone, Integrated Environmental Assessment and Management

Table 10: Stakeholders to consider in an ethical discussion of CCZ nodule collection

Stakeholder Categories	Stakeholder Segments
International and State Actors	
Governments and international authorities with a vested interest in DSM and ABNJ or lack thereof	• ISA and ISA member states • Countries sponsoring the ISA exploration contracts • Coastal countries which may develop processing plants • Developing countries which may benefit from ISA royalties • Countries currently involving in mining the same minerals on land • Countries with downstream participation in the metal industry • Countries interested in rare earth metals • Public authorities regulating environmental and social issues
Supply Chain	
Companies. Any companies affected by introduction of nodule metals or lack thereof	• Companies mining or producing class 1 nickel, cobalt, manganese, copper • Nodule-collector operators and producers • Product manufacturers, e.g., battery cells, manganese alloy products • Supply-chain actors, e.g., material and energy input and service providers, suppliers of machinery, systems, and other equipment, transport
Individuals, Local, or Special Interest	
Interest Groups. Advocacy groups, NGOs, experts, universities, and groups and coalitions focused on environmental, social and economic impacts	• Universities and scientific ecosystem including marine and terrestrial ecologists, industrial ecologists, climate scientists, data-based policy advocates • Ecosystem-preservation groups and conservationists • Climate change advocates • Waste reduction, recycling, circulate economy advocates • Child labor, labor standards advocates • Indigenous rights advocates and representatives • Organizations concerned with the rights and prosperity of developing nations
Communities. Groups directly or indirectly affected by the CCZ nodule collection or expansion of terrestrial mining	• Residents living in proximity to mines, processing plants, tailings dams • Developing-country communities dependent on mining income • Communities of child and artisanal laborers • Indigenous communities • Supporting ecosystems of metal-production value chain
Individuals. People directly or indirectly affected by CCZ nodule collection or expansion of terrestrial mining	• Consumers of products containing these metals • Individuals affected by climate change, water use, pollution, etc. • Miners, construction workers, nodule-collection workers, engineers, employees

Source: Steven Katona, et al, 2021. Ethical opportunities in deep-sea collection of polymetallic nodules from the Clarion-Clipperton Zone, Integrated Environmental Assessment and Management, Figure 2

VIII. Consultation Process

A. SIA Scoping Consultation

As already noted in Section I, the purpose of this Scoping Document is threefold:

1. Inform stakeholders about the planned NORI-D Project.
2. Solicit stakeholders' input in designing the TOR for the Project's SIA study.
3. Demonstrate that the Project has engaged with stakeholders to consider and incorporate their perceptions, expectations, and concerns into the Project's SIA process.

This Scoping document is expected to be published in December 2022. A series of virtual and in-person engagements and consultation activities are being planned and will be announced. Readers are invited to submit their comments online at https://norisiascoping.paperform.co/ or https://metals.co/nori/. Alternately, a template is provided in Annex 2 which can be emailed as an attachment to stakeholders@nori.nr. For ongoing updates about the NORI-D project, readers are encouraged to visit NORI's website and social media[90], and subscribe to newsletters here: https://metals.us18.list-manage.com/subscribe?u=c025d3ca0d7fa4ca16d015990&id=4e5cf6ab35.

As depicted conceptually in Figure 12, the key outcome of the *Scoping phase* will include the following outputs: a Summary Record of Scoping (includes summary of comments received and how they have been assessed), and the TOR for the Project's SIA study.

Figure 12: Outcome of SIA Scoping includes Record of Scoping and TOR for SIA Study

Source: Prizma, SIA - Social Impact Assessment, TOR – Terms of Reference

Planned engagement and consultation activities for the *SIA Scoping phase* include the following:

1. Engage the Republic of Nauru and the ISA about scoping the SIA.
2. Disclose and promote the Scoping Document via social media channels and informational webinar(s) for a minimum of 30-day public consultation period.
3. The Republic of Nauru will invite the ISA to circulate the Scoping Document to its Member States, Observers and other stakeholders.
4. Conduct stakeholder meetings where possible on the sidelines of (a) ISA's meetings in Jamaica and respond to other events/opportunities to which NORI may be invited to contribute.

[90] https://www.facebook.com/NauruOceanResources/ https://twitter.com/nori_nauru?lang=en

5. Engage the Republic of Nauru and the ISA about public comments received, results of scoping, and emerging TOR for the SIA.
6. Publish a Record of SIA Scoping (includes summary of comments received), and TOR for the SIA study.
7. The Republic of Nauru will invite the ISA to distribute public comments received, Record of SIA Scoping, and TOR for the SIA to its Member States, Observers, and other stakeholders.
8. Conduct a webinar to present outcome of scoping process, including summary of public comments, TOR and next steps relating to the SIA study and its engagement activities.

Stakeholders should be aware that the views they contribute during consultation events for the SIA Scoping phase will inform and help design the TOR for the SIA. It will not restrict their ability to provide further comments at later stages, including during the SIA study. Also, it is understood that stakeholder participation does not imply consent for the Project. NORI-D's overall stakeholder engagement process is designed to be iterative, continuous, and will not end with the SIA process.

B. Future SIA Study Consultation

Later on, in the *SIA phase*, the SIA will also be subject to public consultation, as depicted conceptually in Figure 13. The outcome of the SIA will be integrated into an EIS, which is required by the ISA as part of NORI's exploitation application for the Project.

Figure 13 SIA study will also be subject to engagement and consultation

Source: Prizma; SIA – Social Impact Assessment, TOR – Terms of Reference

As outlined in ISA's Template Table of Contents for an EIS[91], the Project's planned SIA will describe the obligation, goals, nature, methods, extent and outcome of disclosure and consultation activities with interested stakeholders. A summary of the stakeholders' key concerns and comments, and how these will be addressed, will also be provided. In addition, plans for continuation of the consultation process will be outlined.

NORI plans to submit its application for an exploitation contract for the NORI-D Project in H2 2023. This will also require the submission of an EIS to the ISA for approval. This will include the key findings of the SIA.

[91] See ISBA/25/C/WP.1, Section 13. Consultation, 13.1 Consultation methods, 13.2 Stakeholders, 13.3 Public consultation and disclosure, and 13.4 Continuing consultation and disclosure

C. Examples of Past Engagement and Consultation

NORI conducted a global stakeholder consultation workshop in Q1/2020 to inform both the Collector Test EIA and the ESIA for the operational phases. The workshop was held in San Diego, US, from 5-6 February 2020 (see Figure 18), shortly before the outbreak of the COVID-19 pandemic. Over 55 stakeholders attended the two-day event in person, and a further 20 attended remotely. Additional stakeholders were invited to attend and chose not to participate. Workshop participants came from over 20 countries. With the exception of concerns about deep-sea mining's potential adverse impacts in terms of closures and job losses for land-based mines, no specific social issues were identified by participants.

Figure 14: Participants at the conclusion of the global stakeholder workshop in San Diego in 2020

Source: NORI

NORI's Collector Test EIS was submitted to the ISA on 29 July 2021 and released for public comment soon thereafter. A public stakeholder workshop was conducted on 5 October 2021 which described the EIA process; after which written comments were submitted to NORI until 19 November 2021. A total of 632 comments were received[92,93]. Social concerns raised include lack of a "social license", concerns about costs/impacts to Pacific Island communities, potential loss of ecosystem services (such as fisheries production), and inadequate stakeholder consultation. The Collector Test EIS was updated in response to public comments. The EIS document was also reviewed by a Certified Environmental Impact Assessor who confirmed that the EIS methodology and processes applied are consistent with good international industry practice.

[92] Comments were received from the Federal Republic of Germany, Deep-Ocean Stewardship Initiative, Deep Sea Conservation Coalition, Deep Sea Mining Campaign, Mining Watch Canada, Government of the United Kingdom, The Pew Charitable Trusts, the United States Government, and 10 submissions from individuals via website portal.

[93] https://bit.ly/3VGDeOg

After reviewing the updated EIS, the ISA – and other stakeholders - requested additional monitoring information from NORI for the Collector Test. In early April 2022, approximately 30 scientists from around the world, NSMA, and the ISA Secretariat met in London, UK (see Figure 15) to finalize an updated monitoring plan.

Figure 15: Scientists gathering to develop more detailed monitoring plans for Collector Test

Source: TMC

On November 1, 2022, during the ISA Council 27th session Part III in Kingston, Jamaica, NORI hosted a side event and presentation[94] on Integrated Ecosystem Assessment and Ecosystem Based Management Framework for Polymetallic Nodule Mining in the CCZ. This presentation was delivered on behalf of consortium led by CSIRO[95], Australia's national science agency and innovation catalyst. Other consortium members conducting the associated research include the Griffith University, the Museum of Victoria, NIWA, and the University of Sunshine State. This research is designed to assist with the development of environmental impact statement, and monitoring and management of mining operations, if approved by ISA.

[94] https://metals.co/download/238783/?tmstv=1667848562

[95] https://www.csiro.au/en/about/We-are-CSIRO

Figure 16: CSIRO presentation during a side event of the ISA Council meeting in November 2022 in Jamaica

Source: TMC, CSIRO - The Commonwealth Scientific and Industrial Research Organisation, an Australian Government agency responsible for scientific research.

D. Grievance Management

The IFC PS1 identifies the need to establish a Grievance Mechanism, noting that "[w]here there are Affected Communities, the client will establish a grievance mechanism to receive and facilitate resolution of Affected Communities' concerns and grievances about the client's environmental and social performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project and have Affected Communities as its primary user. It should seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate and readily accessible, and at no cost and without retribution to the party that originated the issue or concern. The mechanism should not impede access to judicial or administrative remedies. The client will inform the Affected Communities about the mechanism during the stakeholder engagement process.[96]" IFC-compliant grievance mechanisms also cover topics ranging from labor to resettlement.

A core element of NORI's Stakeholder Engagement Plan is the Grievance Management Process. This process involves:

- Established functions at the Project-level;
- A readily accessible and comprehensible service for stakeholders;
- The receipt, acknowledgement, and management (including closure) of concerns from external stakeholders:

[96] IFC, 2012. IFC Performance Standards on Environmental and Social Sustainability, at 15

- Confidentiality provisions; and
- Provisions of separation, whereby experienced and qualified personnel responsible for the managing the Grievance Management Process are separate from the personnel in charge of management and business activities.

The Grievance Management Process will be included in the draft Stakeholder Engagement Plan attached as an annex to the draft SIA and subject to public consultation.

IX. Impacts to be Described or Studied in SIA

A. Introduction

Scoping is the process of identifying and prioritizing the key issues associated with a project, and the extent to which they need to be investigated (studied) as part of the SIA. The purpose of this Scoping Document is to support an engagement and public consultation process designed to assist NORI (and its consultant) to scope the planned SIA for the NORI-D Project.

The key outcome of the scoping phase will include a Summary Record of Scoping which includes the feedback received from the public consultation process and the resulting Terms of Reference (TOR) for the Project's SIA study. Key issues identified from, for example, a review of ISA's emerging requirements, are outlined below. These may be validated or adjusted, and/or additional issues may emerge from the public consultation process, as well as further discussions with Nauru, the ISA, and other stakeholders.

Unless the ISA provides a TOR for NORI-D's SIA, NORI's consultant, Prizma, will generate the TOR. This will also take into account the result of the engagement and public consultation process associated with the SIA's scoping phase. The TOR will be further validated in discussion with NORI, Nauru and the ISA, and published by NORI.

The TOR is expected to include the following sections:

- Background
- Objectives
- Applicable Standards
- Scope of Work
- Structure of SIA
- Provisional Schedule

These will incorporate the results of the engagement and public consultation outcomes for the scoping stage of the SIA.

A. Identification of Key Issues

The ISA's Draft regulations on exploitation of mineral resources in the Area identifies topics which should be covered in the EIS (see also ISBA/25/C/WP.1: Draft regulations on exploitation of mineral resources in the Area, and ISBA/27/C/5: Draft guidelines for the preparation of environmental impact statements). Those with a socio-economic and socio-cultural dimension are identified further below, along with additional topics emerging from Prizma's research.

In its review, Prizma considered that the siting of various Project facilities will likely be disbursed around the world. For example, relevant sites may include a third-party manufacturing site/shipyard in the Netherlands to convert drill ships, nodule collection activities conducted in the open oceans of the CCZ, use of owned or leased brownfield port and warehousing facilities in Mexico, and construction of a nodule processing facility in India.

Prizma used its team's experience and conducted additional research to identify potentially relevant social topics which may need to be highlighted in this Scoping Document and potentially covered in the SIA. This includes a review of social impacts, processes, changes, risks, and indicators commonly associated with mining projects (see Annex 6 and Annex 7).

Prizma's initial review contained in these annexes shows that most of the social changes, processes, and impacts highlighted in the literature for conventional (land-based) mining projects do not appear to be triggered by or are not particularly relevant, transferable, or significant to the Project. This is largely due to lack of presence of any local communities within hundreds of kilometers of the nodule collection site. See also Prizma's discussion in section VI.H of this document which highlights the intrinsic relationship that Indigenous Peoples have with the oceans, seabed, and environs, notes that Pacific Small Island Developing States (PSIDS) are members of the ISA and participate in its governance, and that - based on Prizma's preliminary screening – the IFC Performance Standards 7 (Indigenous People) and 8 (Cultural Heritage), do not appear to be triggered by the Project – or not at this time.

While the preliminary review suggests that many typical social impacts do not appear to be relevant, transferable or significant, the designation of the resource as the "Common Heritage of Humankind" (see also Box 1) and that the deep-sea mining industry in the ABNJ is new and may require a broader perspective to be applied. Also, other – more typical - social impacts may become relevant once the onshore facilities for downstream activities (such as processing) have been identified.

B. Workforce, Safety & Security

The Project's offshore nodule collection operation requires approximately 650 workers, including back-to-back shifts, and three collection vessels. MARPOL and related requirements, which cover good international management and safety practices for vessel operations (ranging from waste to safety at sea), will apply to NORI's offshore operations.

In September 2022, International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW) and The Metals Company (TMC) announced that they have entered into a labor neutrality agreement to bolster the critical mineral supply chain and to lay the groundwork for sustainable production of electric car batteries while creating a path to more good union jobs in the United States.[97]

Additional and possibly larger and temporary workfare may be required to construct and/or operate onshore facilities, unless tolling arrangements and/or existing "brownfield" processing sites or smelters are selected as suitable alternatives. The indicative size of the workforce required for for on-shore facilities is approximately 1,650. Related social risks may need to be reviewed at a future date in relation to the onshore facilities.

As part of the SIA, the general size and nature of the workforce will be characterized. Capacity-building objectives and commitments will also be highlighted. The relevant health and safety aspects, and broader labor policies and commitment (such as those related to IFC Performance Standards 2) will

[97] https://uaw.org/uaw-reaches-card-check-neutrality-agreement-metals-company/

be reviewed and characterized. Also, the security and human rights context of the Project will be considered and evaluated.

B. Fishing, Tourism & Scientific Research

NORI-D is not located in the way of any global shipping lanes. NORI has not been informed of any existing or planned telecommunication cables within the NORI-D contract area which would need to be protected. Based on observations of ISA contractors, the frequency of vessel passage and commercial fishing in the CCZ is considered low. There are also no known tourism-related activities in the Project area, and no significant tourism is expected at onshore, industrial ports or manufacturing sites (assumed industrial and brownfield context) to be used by and for the Project.

Similar to other offshore operations, such as fishing, wind farms, and oil and gas developments, the safe operation of NORI-D will require a safety zone around its vessels and related activities, and adherence to standard maritime navigational protocols and radio communications to avoid risk of collision. In addition, sediment plumes generated at (a) the seafloor, and (b) sea water return at approximately 1,200 meters below surface (to be tested and confirmed during collector testing in Q4/2022), may potentially have adverse effects, which is being tested and monitored during the Collector Test. Any such linkage to socio-economic receptors will be a focus of the SIA.

The SIA will also describe potential impacts and issues related to scientific research in the Area, Project-related risks, or opportunities.

C. Other Social Effects Linked to ESS

ISA guidance, which refers to the IFC Performance Standards and the Equator Principles, and good international practice drives the approach adopted to evaluating the potential risks and impacts on Ecosystem Services (ESS) from the proposed Project. Applying IFC's guidance[98], the SIA will focus on risks/benefits that people and businesses (or socio-economic receptors) obtain from the ESS.

Each phase of the NORI-D Project (Collector Test, Project Zero, and Project One) may have a different ESS footprint, although the approaches to assessing ESS-related social impacts are expected to be largely the same, as are the predicted applicability and linkages. Additional information pertaining to ESS are expected to emerge from the Collector Test and the operational EIA and will support the SIA to assess the social risks and benefits.

As detailed further in Annex 8, the SIA will consider the following ESS:

- Provisioning ESS (capture fisheries and seafood) with potential for negative effects from the Project, requiring further review and analysis of pending data from Collector Test and operational EIA;

[98] "Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services." Source: IFC Performance Standards: Guidance Note 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources. January 1, 2012.

- One Regulating ESS (climate regulation), on balance, with potential positive effects from the Project, and potential broad scale benefits to various socio-economic receptors;
- One Cultural ESS (scientific exploration, education) with a potential positive effect from the Project and limited direct socio-economic receptors (in addition to benefits for humankind); and
- Two Supporting ESS (nutrient capture, recycling, and primary production) with uncertain and potential low effects considering protected designated "no mining" areas, limited linkages to socio-economic receptors.

Selected ESS are also highlighted in other IFC Performance Standards, such as PS-3 (climate change aspects); PS 4 (Community Health and Safety); PS-5 (possibly for land-based activities); PS-7 (natural resources important to Indigenous Peoples); and PS 8 (cultural heritage).

D. Product Stewardship

The SIA will provide a brief description of relevant product stewardship aspects related to the Project (as defined by the ISA, see also section IV.F below). This means a brief description of transshipment of nodules from the collection site to onshore and – likely - "brownfield" port and warehousing facilities, and onwards transshipment for, at least initially, processing by existing "brownfield" RKEFs. It is assumed that any future construction of nodule processing facilities will be subject to their host country regulatory and permitting requirements (and not the ISA), and would also be expected to be designed to meet Good International Industry Practice (for example, the IFC Performance Standards and Equator Principles, as may be applicable).

E. Impacts on Nauru and ISA

The commercial collection of nodules will result in significant Project revenues, including revenues to be distributed to Nauru, and those which accrue to the ISA. The latter will also be subject to ISA's distribution of excess revenues for the benefit of humankind. The scale and opportunities/risks associated with such new resources will be reviewed as part of the SIA.

F. Impacts on Developing Land-based Producers

The ISA's instruments include setting up and allocating revenues derived from the Area to an Economic Assistance Fund, and assist developing countries which suffer serious adverse effects on their export earnings or economies resulting from a reduction in the price of an affected mineral or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area.

The 2020 Lapteva report[99] concluded that, for all demand growth scenarios studied for copper, nickel, and cobalt, the production by even twelve contractors would not exceed the expected demand growth. However, production of six contractors would exceed the demand growth scenarios for manganese.

[99] Lapteva et al, 2020. Study of the Potential Impact of Polymetallic Nodules Production from the Area on the Economies of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affected, Advanced unedited version, dated May 12, 2020

At this time, only NORI has publicly indicated plans to submit an exploitation application in the near future (H2 2023). Such an application requires submission of a mining plan, a financing plan, successful nodule collector testing, an operational EIS, and other components.

Further discussions with the ISA will be required to confirm any need for follow-up studies by the ISA (or other parties) considering that only six contractors (NORI, BGR, GSR, NIOT, UKSR, and TOML) appear to have sufficiently advanced their activities to be reasonably considered potential applicants for exploitation approvals in the CCZ over the next 5-year period.

G. Cumulative Social Effects

The ISA provides limited guidance about the need for and approach to cumulative effects or impact assessment. In 2021, the ISA reviewed its progress in the implementation of the operational aspects of the environmental management plan for the CCZ[100]. Action items identified by and for the ISA related to cumulative assessment are shown in Table 11, suggesting that no cumulative impact assessment (CIA) may be required until an exploitation application has been submitted. Further clarification on this topic will need to be sought during engagements with the ISA.

[100] https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

Table 11: Action items for the ISA Secretariat relating to cumulative assessment for the CCZ

Index	Objective	Status	Further actions
O2	Undertake cumulative environmental impact assessments as necessary based on exploitation proposals	Not yet applicable - There have been no submissions of an Application for exploitation in the CCZ	Undertake an expert workshop or workshops and/or studies to assess cumulative environmental impact assessments in the CCZ, including qualitative modelling approaches, building on experience from those undertaken as part of regional environmental management plan workshops for the northern Mid-Atlantic Ridge and Pacific Northwest regions
M2	Consider the cumulative impacts of mining and other human activities	Not yet applicable – same as O2	Same as O2 (above)
P5	The secretariat will complete a CIA for seabed mining in the CCZ	Not yet applicable - Same as O2	Same as O2 (above)

Source: ISA Table 1 in Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone Report and recommendations of the Legal and Technical Commission, ISBA/26/C/43 at https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

However, the draft ISA regulations and guidance (ISBA/25/C/WP.1 and ISBA/27/C/5) identifies and implies the need for assessing cumulative impacts. Good International Industry Practice would also suggest the need to consider cumulative impacts as part of the E/SIA processes.

Given the Project's location and context, it is assumed that the valued social components (including ecosystem services) to be considered for a cumulative impact assessment are listed in Table 12.

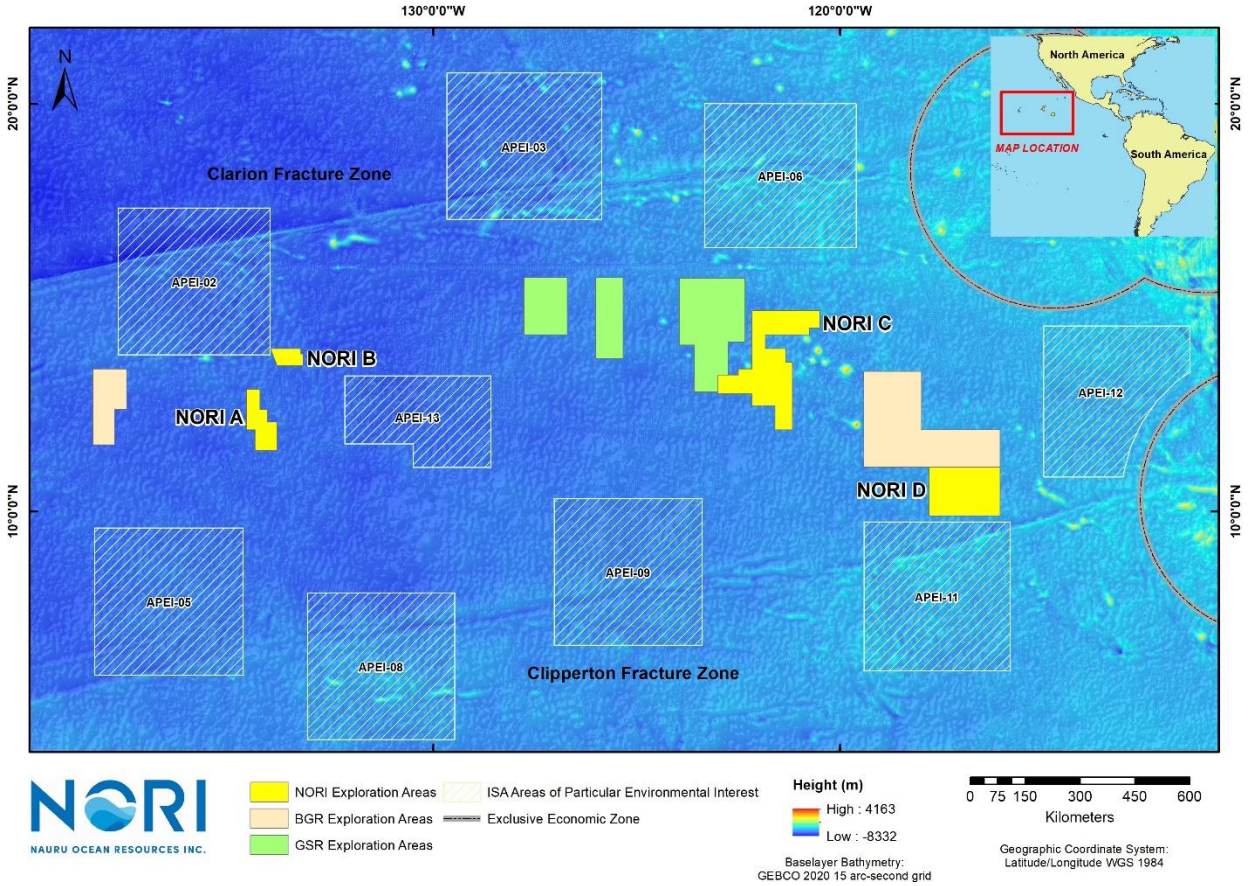
Table 12: Assumed valued social components to consider for consultation on cumulative assessment

VSC	ESS	Spatial Boundary	Temporal Boundary
Migratory marine species	Provisioning Cultural	Migratory regions, PSIDS	TBC
Climate Change (carbon sequestration, sea level rise, climatic events)	Regulating Supporting	CCZ or global abyssal planes, PSIDS region	TBC
Climate Change impact of Project (emissions, avoidance)	Regulating Supporting	PSIDS region or Global	TBC
Volume and price of battery metals	Provisioning	DLBPS (global commodity markets)	TBC
Benefits for humankind (revenues, knowledge, training)	Provisioning	CCZ, PSIDS (global distribution)	TBC
Other	TBC	TBC	TBC

Source: Prizma, DLBPS – Developing Land-Based Producer States, ESS – Ecosystem services, PSIDS – Pacific Small Island Developing States, TBC – To be confirmed, VSC -Valued social component, the list of VSC and their spatial and temporal boundaries are indicative.

Two key cumulative impacts scenarios may need to be considered. First, the phased expansion and vertical integration of NORI's Project Zero into Project One. Second, the development of additional nodule collection operations by NORI (other blocks) or other contractors in the CCZ.

Figure 17: Location of NORI, BGR, GSR Contract areas in the CCZ



Source: NORI (with shape files from the ISA), BGR - German Federal Institute for Geosciences and Natural Resources, GSR - Global Sea Mineral Resources (sponsored by Belgium).

Relevant other major developments which may significantly affect valued social components potentially affected by the Project may also be considered. These may include, for example, other planned deep-sea mining operations, commercial illegal fishing operations, and shipping traffic affecting migratory marine species. In addition, Global Warming and its impacts may also need to be considered.

H. Other Topics

The objective of the public consultation for the scoping of the SIA is to obtain stakeholder input to help validate and/or identify additional social risks/opportunities which should be considered when developing the TOR and conducting the SIA study.

X. Methodology For Impact & Risk Assessments

The ISA's Legal and Technical Commission's draft guidance (ISBA/25/C/WP.1 and ISBA/27/C/5) contains a table of content for an EIS, which are reproduced below. Key terms and their definitions or ISA expectations are shown in Table 13. Key ISA terms and expectations relevant to the SIA are contained in Table 14. The draft regulatory regime also includes references to the IFC Performance Standards and the Equator Principles. The SIA will characterize both positive and negative effects.

Table 13: Draft ISA Template for a Table of Content of an EIS

Section	Heading
ES	Executive Summary
1.	Introduction
2.	Policy, legal and administrative context
3.	Description of the proposed development
4.	Description of the existing physicochemical environment
5.	Description of the existing biological environment
6.	Description of the existing socioeconomic environment
7.	Assessment of impacts on the physicochemical environment and proposed Mitigation
8.	Assessment of impacts on the biological environment and proposed Mitigation
9.	Assessment of impacts on the socioeconomic environment and proposed Mitigation
10.	Accidental events and natural hazards
11.	Environmental management, monitoring and reporting
12.	Product stewardship
13.	Consultation
14.	Glossary and abbreviations
15.	Study team
16.	References
17.	Appendices

Source: ISA, 2019. Draft regulations on exploitation of mineral resources in the Area Prepared by the Legal and Technical Commission ISBA/25/C/WP.1 and ISA, 2022. Draft guidelines for the preparation of environmental impact statements Prepared by the Legal and Technical Commission

Table 14: Key ISA terms and expectations relevant to the SIA

Topic	Brief definition, description, or expectation of the ISA
Cumulative impacts*	The nature and extent of any interactions between various impacts, where they may have cumulative effects, must be considered on both spatial and temporal scales over the lifetime of the mining operation. ISA's documents[101] imply that the ISA will conduct such a study.
Description of the proposed development	Provide details of the proposed development activity, including relevant diagrams and drawings. It is understood that most projects will likely involve the recovery of minerals from the Area, with the concentrating process(es) occurring on land within a national jurisdiction (outside the jurisdiction of the ISA). While it is expected that this section would provide a brief description of the entire project, including offshore and onshore components, the Environmental Impact Statement should focus on those activities occurring within the ISA's jurisdiction (e.g., activities related to the recovery of the minerals from the Area up to the point of trans-shipment).
Environmental Effect	Means any consequences in the Marine Environment arising from the conduct of Exploitation activities, whether positive, negative, direct, indirect, temporary or permanent, or cumulative effect arising over time or in combination with other mining impacts.
EIA	"Environmental impact assessment (EIA)" is the process of identifying, predicting, evaluating and mitigating the physicochemical, biological, socioeconomic and other relevant effects of development proposals prior to major decisions being taken and commitments made. This includes all potential effects, both positive and negative, and encompasses natural and anthropogenic receptors.
Fisheries*	A description of potential impacts and issues to be addressed, along with proposed management measures and a description of residual impacts.
Marine traffic*	A description of potential impacts on non-project-related marine traffic occurring within the project area, along with proposed management measures and a description of residual impacts.
Product stewardship*	Provide a brief description of the intended use of the mineral-bearing ore once it leaves the Area. The description should also address the meeting of standards for environmental management. The intention is not to provide a full and highly detailed account, but, where information is known about environmental impacts, these impacts should be described briefly here.

[101] https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

Topic	Brief definition, description, or expectation of the ISA
Serious Harm	Means 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 Authority on the basis of internationally recognized standards and practices informed by Best Available Scientific Evidence.
Sites of an archaeological or historical nature*	List any sites of archaeological or historical significance that are known to occur within the potential area of impact.
Stakeholder	Means a natural or juristic person or an association of persons with an interest of any kind in, or who may be affected by, the proposed or existing Exploitation activities under a Plan of Work in the Area, or who has relevant information or expertise.
Socioeconomic and Sociocultural issues*	This section will provide a description of economic benefits or impacts, including any applicable social initiatives.
Summary of existing sociocultural environment*	A table may be a useful summary format. Potential cumulative effects should also be included
Standards	Means such technical and other standards and protocols, including performance and process requirements, adopted pursuant to [ISA] regulation 94.
Tourism*	A description of potential impacts and issues to be addressed, along with proposed management measures and a description of residual impacts.

Source: ISA 2019 Draft regulations on exploitation of mineral resources in the Area, prepared by ISA's Legal and Technical Commission (ISBA/25/C/WP.1). * Terms or headings used in ISA's guidance related to the EIS Template

According to IFC's Guidance, for "certain projects, and particularly for greenfield investments and projects (including, but not limited to, major expansion or transformation-conversion activities) involving specifically identified physical elements, aspects and facilities that are likely to generate potentially significant adverse environmental and social risks and impacts, the client [developer] should conduct a comprehensive full-scale ESIA. The key process elements of an ESIA generally consist of (i) initial screening of the project and scoping of the assessment process; (ii) examination of alternatives; (iii) stakeholder identification (focusing on those directly affected) and gathering of environmental and social baseline data; (iv) impact identification, prediction, and analysis; (v) generation of mitigation or management measures and actions; (vi) significance of impacts and evaluation of residual impacts; and (vii) documentation of the assessment process (i.e., ESIA report)" [102]. This general process and associated methodologies will be followed for the Project's SIA.

To facilitate engagement and public consultation, the Scoping Document includes a high-level Project Description and relevant context. The Project's spatial and temporal boundaries, and its socio-economic area of influence will be further analyzed and characterized. The Project's social area of

[102] IFC Guidance Notes: Performance Standards on Environmental and Social Sustainability, January 1, 2012, at 10

influence - considering its unique nature - will be further defined, taking also into account the results of the monitoring gathered during the Collector Test (expected in Q4/2022), the on-going environmental assessment, planned discussions with the Republic of Nauru and the ISA, and comments received during the public consultation process.

Key sources of risks and their predicted impacts (which can also be positive), and their differentiated burden (or benefit) on social receptors will be identified and segmented using characteristics such as type, extent, duration, reversibility, scale, and frequency, before ranking them by significance. This process will also consider health, safety and labor issues, and cumulative social impacts.

Rating of significance is typically expressed in terms, such as negligible, minor, moderate, or major, as illustrated below, based on criteria which will be defined for key social aspects of the Project during the SIA process. The rating will consider social receptors, contextual issues, and variability of value (importance) which may be assigned by different stakeholders to the same topic or impact. The SIA will also highlight significant data gaps or uncertainties if they would materially affect the risk ratings.

Figure 18: Commonly used ESIA impact evaluation matrix

Severity of Impact	Magnitude of Potential Impacts							
	Adverse Impacts				Beneficial Impacts			
		Major	Moderate	Minor	Negligible	Minor	Moderate	Major
	High	Major	Major	Moderate	Negligible	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Negligible	Minor	Moderate	Major
	Low	Moderate	Minor	Negligible	Negligible	Negligible	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

The SIA will also consider how to apply the mitigation hierarchy, which prioritizes actions ranging from avoidance to compensation. The SIA will use the emerging findings to develop and propose appropriate social mitigation measures and outline key performance indicators and social management plan(s). These will be developed in a participatory way with relevant/affected receptors. Significant residual social risks will also be identified and characterized.

In line with IFC guidance[103], a cumulative social impact assessment will also be conducted, considering valued environmental and social components identified by key stakeholders and their relevance to the Project. The approximate temporal boundary is expected to include the life of the Project (2046) and/or the Paris Agreement's net-zero milestone of 2050. Spatial boundaries will need to consider the emergence of other deep-sea mining operations within the CCZ. A preliminary analysis of indicator examples contained in the IFC's guidance note on cumulative impact assessment, along with a preliminary analysis to explore if/how they may be relevant to the Project, are presented in Annex 8.

[103] IFC, 2013. Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets.

A framework approach, such as commitments to relevant IFC Performance Standards and host country requirements, or inclusion in social action plan, may need to be applied when certain physical aspects – such as site-based decisions about onshore processing facilities – are insufficiently defined to allow a meaningful assessment of social risks or impacts.

Annex 1: Prizma's Key Contributors to this Scoping Document

Mr. Mehrdad Nazari is Prizma's Team Leader and Project Manager for the NORI-D SIA assignment. He has over 25 years of experience, worked on over 150 projects in nearly 50 countries. This includes 10 years at the European Bank (EBRD) in London, where he focused on complex extractive projects. His advisory practice focusses on mining, renewable power, and private equity. He has contributed to Independent Engineer/Monitoring Groups, delivered courses on the IFC Performance Standards and the Equator Principles, and has been appointed to the E&S Expert Rosters at the grievance mechanisms of two multilateral financial institutions. Mr. Nazari studied geosciences in Germany (BSc-equivalent, Mineralogy, J.W. Goethe), USA (German Fulbright grantee at UW-Milwaukee) and the UK. He holds an MSc in Hydrogeology (University of Birmingham), completed Sustainability Studies through the Rockefeller Foundations Leadership for Environment and Development program, and obtained his MBA at Henley Business School in the UK. Mehrdad is an AccountAbility licensed AA1000AS assurance service provider, and a Mining Association of Canada (MAC) certified Towards Sustainable Mining (TSM) Verification Service Provider. He is also a member of the International Association for Impact Assessment (IAIA), and resides in Wisconsin, USA.

Dr. William Kennedy, a recipient of an IAIA Lifetime Achievement Award, has over 35 years of international experience, and is an Associate of Prizma. He served as an Administrator at the Environmental Directorate of the OECD, Paris, was a Senior Program Officer at the UNEP in Kenya, and headed Policy and Strategy at EBRD's Environmental and Sustainability Unit in London. He also served as Executive Director of the Commission for Environmental Cooperation of North America in Montreal, was an EIA Advisor to the US Millennium Challenge Corporation, a Board Member at the IAIA, an Adjunct Professor (Geography), Concordia University, Montreal, and a Senior Associate at UNEP-McGill Collaborating Center on Environmental Assessment, Montreal. Dr. Kennedy currently serves as a part-time Director, Office of Accountability, at the US Development Finance Corporation (formerly OPIC). His degrees include an MPA from the University of Colorado Boulder, and a PhD in Environmental Policy from the Freie Universität Berlin, Germany. Dr. Kennedy resides in Montreal, Canada.

Dr. Don Proebstel is a Conservation Biologist and a long-term Associate of Prizma with over 25 years of international professional experience, including as VP Environmental & Sustainability at Gold Reserve Inc., directing the ESIA/ESMS and developing NGO partnerships for the $650 million gold-copper project in Venezuela; Senior Environmental & Social Analyst with the US Overseas Private Investment Corporation (OPIC, now DFC); Senior Analyst Pike Research (now Navigant Research); and Senior Environmental Analyst at AATA International. Dr. Proebstel attended the 1992 Rio Conference, Convention on Biodiversity and follow-up UNEP COP meetings, including Curitiba Brazil (COP-8, 2006) and the IUCN World Conservation Congress in Hawaii in 2016. Dr. Proebstel is also a Director at Natural Power Concepts, which is involved in the development of advanced renewable energy technology solutions. Based in Hawaii, he has worked with/developed and secured funding from the US Air Force Research Laboratory (AFRL) and also with the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii-Manoa. Early in his career, he served as the Director, World Salmonid Research Institute, and as a Senior Research Advisor, Wild Salmon Center, where he participated in ten annual river expeditions to Siberia and Kamchatka. Dr. Proebstel's academic degrees include a B.S. Fishery Biology and a PhD. In Conservation Biology, Colorado State University. He is a Mining Association Canada-certified Towards Sustainable Mining Verification Service Provider. Dr. Proebstel is based in Hawaii.

Annex 2: Public consultation template for the SIA scoping stage of NORI-D

When preparing their comments, stakeholders are invited to consider the goals and objectives of the Scoping Document to generate the Terms of Reference for the Social Impact Assessment study for the NORI-D Project. The Scoping Document is designed to provide a Project Description and its context to be enable relevant agencies, potentially affected communities, and other stakeholders to identify and prioritize key social attributes or effects (both negative and positive), which should be considered or studied as part of the SIA study. The SIA study will also be subject to additional public consultation.

Readers are invited to submit their comments online at https://norisiascoping.paperform.co/ or https://metals.co/nori/. Alternately, a template is provided in Annex 2 which can be emailed as an attachment to stakeholders@nori.nr. For ongoing updates about the NORI-D project, readers are encouraged to visit NORI's website and social media[104], and subscribe to newsletters here: https://metals.us18.list-manage.com/subscribe?u=c025d3ca0d7fa4ca16d015990&id=4e5cf6ab35.

[104] https://www.facebook.com/NauruOceanResources/ https://twitter.com/nori_nauru?lang=en

Public consultation form for the SIA scoping stage of NORI-D

Instructions: Fill out and email as attachment to stakeholders@nori.nr with subject "SIA scoping consultation". An online version of this may also be filled out and accessed here.

Contact Information	
Last Name	
First name	
Name of Organization	
Type of Stakeholder*	
Country	
Email/contact details	
Request confidentiality (Y/N)	

List up to 5 social/cultural/economic attributes or receptors you believe could be negatively affected by the Project

List up to 5 social/cultural/economic attributes or receptors you believe could be positively affected by the Project

General Comments

Specific and Prioritized Comments		
Section or Topic	Page	Comment

* Type of stakeholder may include International and State Actors, Companies, Interest Groups, Communities, Individuals or Other (please specify), as categorized in Table 8

Annex 3: Other Relevant Convention, Protocols and Codes

CONVENTIONS, PROTOCOLS AND CODES	DESCRIPTION/IMPLICATIONS
Marine	
Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (1986), also known as the SPREP Convention or Noumea Convention.	Agreement for the protection, management, and development of the marine and coastal environment of the South Pacific Region and represents the legal framework of the Action Plan for managing the Natural Resources and Environment of the South Pacific adopted in 1982.
Protocol for the Prevention of Pollution of the South Pacific Region by Dumping (1990) (Amendment) 2006	The objective of the protocol is to prevent, reduce and control pollution by dumping of wastes and other matter in the South Pacific.
International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004)	Under the Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. The Convention requires all ships to implement a Ballast Water and Sediments Management Plan, and to carry a Ballast Water Record Book and are required to carry out ballast water management procedures to a given standard.
1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (as amended in 2006)	Article 1 Definitions Article 4.2 "Dumping" does not include: 4.3 The disposal or storage of wastes or other matter directly arising from, or related to the exploration, exploitation and associated offshore processing of seabed mineral resources is not covered by the provisions of this Protocol.
The International Marine Minerals Society's Code for Environmental Management of Marine Mining (2001)	The code anticipates and integrates environmental considerations for responsible marine mining. The Code seeks to complement national and international marine mining environmental regulations where they exist, and to provide environmental principles and guidelines where these are absent or could be improved.
Fauna and Flora	
Convention on Biological Diversity (1992)	The convention covers conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from using genetic resources, including on the deep seabed.
Memorandum of Understanding for Cetaceans and their Habitats in the Pacific Island Region (2006)	To provide an awareness of international responsibilities to conserve cetacean populations of the Pacific Islands Region, in particular, pursuant to the Convention on Biological Diversity (CBD) for which the Convention on the Conservation of Migratory

	Species of Wild Animals (CMS) is the CBD lead partner in the global conservation of migratory species over their entire range.
UNCLOS (article 145 Part XII) Protection of the Marine Environment	To ensure the marine environment and all species related are protected and that no harm comes to flora or fauna during human activities.
Climate	
Vienna Convention for the Protection of the Ozone Layer (the Vienna Convention) (1993) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1992)	To provide guidelines and protocols for the protection of the ozone layer on a global scale.
United Nations Framework Convention on Climate Change (1992)	An international environmental treaty providing guidelines and frameworks addressing climate change on a global scale.

Annex 4: Non-governmental Organizations with Observer Status at the ISA

According to the ISA[105], Observers are allowed to participate in the work of ISA's Assembly and the Council, subject to certain limitations. NGO Observers may sit at public meetings of the Assembly and, upon invitation from the President and subject to approval by the Assembly, may make oral statements on questions within the scope of their activities. Written statements submitted by NGO observers within the scope of their activities which are relevant to the work of the Assembly are made available by the Secretariat in the quantities in the languages in which the statements are submitted. All observers of ISA may designate representatives to participate, without the right to vote, in the deliberations of the Council, upon the invitation of the Council, on questions affecting them or within the scope of their activities.

Advisory Committee on Protection of the Sea
African Minerals Development Centre
Center for Oceans Law and Policy, University of Virginia School of Law
Center for Polar and Deep Ocean Development, Shanghai Jiao Tong University
Cluster maritime français
Committee for Mineral Reserves International Reporting Standards
Conservation International
Deep Ocean Stewardship Initiative
Deep Sea Conservation Coalition
Durham University's Centre for Borders Research
Earthworks
Fish Reef Project
Greenpeace International
Institute for Advanced Sustainability Studies
InterRidge
Interamerican Association for Environmental Defense
International Association of Drilling Contractors
International Cable Protection Committee
International Dialogue on Underwater Munitions
International Marine Minerals Society
International Ocean Institute
International Policy Laboratory of the Massachusetts Institute of Technology
Japan Agency for Marine-Earth Science and Technology
Law of the Sea Institute
Mining Standards International
OceanCare
Oceans North
Ocean Society of India
RESOLVE
Sargasso Sea Commission
Sasakawa Peace Foundation
The Ocean Foundation
The Pew Charitable Trusts
Thyssen-Bornemisza Art Contemporary
World Ocean Council
World Organization of Dredging Associations
World Wildlife Fund International

[105] https://www.isa.org.jm/observers?msclkid=393cbaccb68b11ecb6cbfc82380ecbbc accessed 4/7/2022

Annex 5: Changes induced by terrestrial mining that can lead to social impacts and risks

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Population and demographics	In-migration, out-migration, workers' camps, social inclusion, growth or decline of towns, conflict, and tensions between social groups	Not readily transferable to deep-sea nodule collection. Onshore activities require further definition and analysis.
Crime and social order	Corruption, domestic violence, sexual violence, substance abuse and trafficking, prostitution, change in social norms, pace of change for vulnerable communities	Not readily transferable to deep-sea nodule collection. No significant changes or risks expected. Onshore activities require further definition and analysis.
Culture and customs	Change in traditional family roles, changing production and employment base, effects of cash economy, reduced participation in civil society, community cohesion, sense of place, community leadership, cultural heritage	Not readily transferable to deep-sea nodule collection. Important cultural connection of Pacific islander with the ocean and its environs. No significant changes or impacts expected from the Project. Onshore activities require further definition and analysis.
Social infrastructure services	Demands on and investment in housing, skills (shortages and staff retention), childcare, health, education, and training	Not readily transferable to deep-sea nodule collection. No significant changes or impacts expected for Project. Onshore activities require further definition and analysis. Revenues accrued to the Republic of Nauru and ISA may enable additional investments into social infrastructure.
Community health and safety	Disease, vehicle accidents, spills, alcohol and substance abuse, pollution, interruption to traditional food supply, awareness, and treatment programs	Not readily transferable to deep-sea nodule collection. No significant changes or impacts expected for Project. Onshore activities require further definition and analysis.
Labor practices	Health and safety, working conditions, remuneration, right to assemble, representation in unions, labor force participation for women	Fully transferable to the Project.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Political	Pacific Island state government focus and resources on deep-sea mining, opportunity cost for other development options	May be transferable to deep-sea nodule collection. Foreign aid and fisheries dependent Republic of Nauru using DSM to diversify and increase revenue generation opportunities. Resources required covered by contractor. Other political issues may relate to campaigns and pressure targeting the Republic of Nauru by external parties, also other Pacific Islands. Onshore activities require further definition and analysis.
Human rights and security	States overriding community self-determination, suppression of opposition and demonstrations, targeting of activists, rights awareness programs	Not fully transferable to deep-sea nodule collection. NORI to develop appropriate policies, systems. Onshore activities require further definition and analysis. TMC's board strives to achieve gender parity. NORI committed to provide 50% training opportunities to women.
Gender and vulnerable groups	Disproportionate experience of impact and marginalization of vulnerable groups (e.g., women, disabled, aged, ethnic minorities, Indigenous, and young), equity in participation and employment	No local communities for deep-sea nodule collection. ISA-required capacity building provides opportunities, targeting also women. Onshore activities require further definition and analysis. TMC's board strives to achieve gender parity. NORI committed to provide 50% training opportunities to women.
Distribution of benefits	Employment, flow of profits, royalties and taxes, training, local business spending, community development and social programs, compensation, managing expectations, equitable distribution across state/regional/local/ethnic or family groups, cash economy	Planned benefit sharing with ISA and the Republic of Nauru. Nodule recovery payments to the Republic of Nauru to be paid into the Seabed Minerals Fund. ISA has developed conceptual methodology for equitable distribution. Considers also impacts on Developing Land-Based Producer States, including potential loss of revenues from their land-based mining operations due to deep-sea mining. Onshore activities require further definition and analysis. NORI maintains community/grants programs. ISA provides for capacity building.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Industry	Change in industry composition, dominance by foreign entities in a high-tech industry	Transferable to deep-sea nodule collection and NORI. Multilateral ISA centrally involved and regulating, except for Sponsorship arrangements involving ISA Member States. Impacts on Developing Land-Based Producer States considered. Onshore activities require further definition and analysis.
Inflation/deflation	Housing (ownership and rents), food, access to social services	The Republic of Nauru's legislation requires revenue from DSM to be placed into Seabed Minerals Fund, provides opportunity to manage for future generations and mitigate inflationary impacts. Revenues from nodule recovery to the Republic of Nauru indexed for inflation. Revenues for the Republic of Nauru could be earmarked for services/infrastructure and/or contribute to an existing trust fund. Onshore activities require further definition and analysis.
Infrastructure	Demands on and investment in ports, power, communications, and related infrastructure	Transferable to the Project. Onshore activities require further definition and analysis.
Pollution and amenity	Terrestrial, coastal (port and transport), surface (spills and transport), and deep-water (associated with mining activity) pollution	Transferable to Project, which is required to meet ISA/MARPOL/IFC PS/EHS Guidelines. Onshore activities require further definition and analysis.
Resettlement	Consent and consultation for resettlement, compensation, ties to land, adequacy of resettlement housing and facilities, equity, post-settlement conditions, livelihoods	Not transferable to DSM in CCZ. Onshore activities require further definition and analysis.
Disturbance	Disruption to economic and social activities (including by exploration), consultation for access, frequency and timing, compensation	Not relevant to deep-sea PMH collection activities in CCZ. Onshore activities require further definition and analysis.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Resources (access/competition)	Marine resources, subsistence fishing, cultural practices, scarce infrastructure	Transferable to dep sea PMN collection and requires further analysis, although lack of local communities, depths, distances, etc. not indicative of significant social/livelihood impacts. Onshore activities require further definition and analysis.
Community engagement	Consultation, communication, participation, empowerment, access to decisionmakers, transparency, timing, inclusiveness (particularly for vulnerable and marginalized groups), respect for customs and authority structures, reporting	Generally transferable, although no local community present at deep-sea PMN collection site. Onshore activities require further definition and analysis. The context of Common Heritage of Humankind will need to be considered.
Consent	Cultural use of terrestrial and marine areas (free, prior, and informed consent), community consent	Dee sea PMN collection in the Area outside of national jurisdictions or Indigenous territories, no locally affected communities, no resettlements. Key Indigenous/Pacific islands, with strong cultural attachments to and reliant on Oceans, are members of the ISA. Onshore activities require further definition and analysis.
Participation	Planning, development of programs, monitoring, selection of alternatives and technologies, operational aspects	Transferable to deep-sea polymetallic nodule collection. Stakeholder engagement planned. Participatory approached planned for potentially significant adverse social impacts/opportunities. Onshore activities require further definition and analysis. The context of Common Heritage of Humankind (see also Box **1**) will need to be considered.
Remedy	Grievance and dispute resolution, acknowledgment of issues, compensation, mitigation	Transferable to deep-sea PMN nodule collection and onshore developments. Grievance mechanism part of stakeholder engagement plans.
Agreements	Equity, timely honoring of commitments, issues with delivery, duress, clarity of obligations, capacity, and	Transferable to deep-sea PMN nodule collection and future onshore facilities.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
	governance (including government capacity to respond to and manage change)	
Community development	Participation, adequacy, appropriateness, capacity to facilitate, consistency, prioritization	Transferable to deep-sea PMN nodule collection . NORI has programs in place in the Republic of Nauru (described in TMC's 2021 Impact Report). Onshore activities require further definition and analysis.

Source: Adapted from Roche C. and Bice, S, 2013. Anticipating Social and Community Impacts of Deep-Sea Mining, in SPC, 2013, in Deep Sea Minerals and the Green Economy. Baker, E., and Beaudin, Y (Eds) Vol 2, Secretariat of the Pacific Community. LBM – Land-based mining, DSM – Deep-sea mining

Annex 6: Indicators commonly used in social impacts assessment for the mining sector[106]

Impact category	Impact Topics	Preliminary analysis for the Project
Economy, income, and security	**Positive** • Income • Business **Negative** • Bribery • Thefts and accidents • Inequality • Social tension • Poverty	• Job creation opportunities (appr. 650 for Project One offshore nodule collection) • Ethics, taxation (royalties) dictated by ISA, host countries for future processing sites • Governance & disclosure requirements dictated by listing requirements, Participation in UN Global Compact • Benefit sharing negotiated with the Republic of Nauru • Equal opportunity is a material industry and ISA topic • Positive science/knowledge of deep-sea ecosystem • No local communities at deep-sea PMN nodule collection site (unknown for onshore/future sites) • More limited and disbursed boom/bust/social tensions (unknown for onshore/future sites • The context of Common Heritage of Humankind will need to be considered
Employment and education	**Positive** • Employment • Skills & education **Negative** • Child/Forced labor • Poor working conditions • Lack of freedom to organize • Temporary jobs • Unemployment	• Job creation opportunities (Offshore nodule collection: Project One approximately 850 total: 650 collector vessel; 200 transport vessels) • Unknown employment/training for onshore or processing facilities • ISA-required training targeting developing countries • No risks related to child/forced labour, artisanal mining • High quality working/contracting conditions, no “flag of convenience” for marine operations • IFC PS2/freedom of association applies • More limited and disbursed construction boom/bust and temporary jobs

[106] Source if Impact Category and Topic: Mancini, L. and Sala, S., 2018. Social impact assessment in the mining sector: Review and comparison of indicators frameworks. Resources Policy, Volume 57, August 2018, Pages 98-111 (see Table 2), Analysis by Prizma

Impact category	Impact Topics	Preliminary analysis for the Project
Land use and territorial aspects	**Positive** • Infrastructure Negative • Expropriation/Displacement • Access to land	• No new/major traditional mining infrastructure for deep-sea PMN nodule collection site • Unknown infrastructure requirements for onshore/future processing • Existing strategy for oil industry assets (drilling ships etc.) • No presence or displacement of landowners at deep-sea PMN nodule collection site • Unknown displacement risk at onshore/future processing • Brownfield site expects to create insignificant risks • The context of Common Heritage of Humankind (see also Box **1**) will need to be considered
Demography	**Positive** • Population growth **Negative** • Gender imbalance, influx • Inflation	• Demography not affected by Project • Unknown demography impacts at onshore/future processing • No influx typical to terrestrial mining, capital construction projects • Project-induced inflationary pressures unlikely
Environment, health, and safety	**Positive** • None listed **Negative** • Water use competition • Health impacts • Environmental impacts affecting health	• Deep-sea PMN nodule collection has materially lower environmental resource/GHG intensity compared to LBM • Project can contribute critical metals, help transition to low carbon economy, the world's most material global environmental threat facing the world • No competition for water or land, and not near Indigenous People • Robotic mining results in lower health & safety risks (TMC/NORIS H&S statistics exemplary: 0 fatalities, 0 LTIFR from 2018-2021) • No industrial-scale use of hazardous chemicals or processing at deep-sea PMN nodule collection site (unknown at future processing facility) • Positive science and knowledge of deep-sea ecosystem • Concerns noted by conservation NGOs and others about ecological impacts

Impact category	Impact Topics	Preliminary analysis for the Project
Human rights	**Positive** • None listed **Negative** • Human rights abuses • Culture/aesthetic resources • Stakeholder inclusion • Discrimination • Indigenous rights	• Deep-sea PMN nodule collection in CCZ governed by multilateral ISA has materially lower risk profile compared to, for example, many emerging markets • ISA established a level playing field/regime to enable developing, land-locked countries, and others to benefit from natural resources in the CCZ/Area • ISA prioritizing gender balance and support for women • Pacific islanders' connection with oceans and environment (and many are ISA members) • ISA establishing approach for equitable distribution of excess revenues • IFC PS2 (including discrimination) are applicable • No presence of local communities or IPs at deep-sea PMN nodule collection site (unknown at future processing facility) • The context of Common Heritage of Humankind (see also Box **1**) will need to be considered.

Annex 7: Preliminary review of potential Ecosystem Services effects of the Project

ESS Type	Specific examples cited in PS Guidance Notes	Applicability - Possible Impact	Linkage to Socio-economic Receptors
• Provisioning ESS	• i agriculture, capture fisheries, seafood, game	• Potential negative effects to capture fisheries/seafood– requires further data/analysis being generated by Collector Test and operational EIA (sediment plume).	• More data required for deep-sea PMN nodule collection site and effects associated with, for example, sediment plumes. Unknown for undefined onshore facilities
	• ii water (drinking, industrial, irrigation) • iii forest areas	• Not applicable to DSM site in CCZ (ocean) • Unknown for undefined onshore facilities	• Not applicable to deep-sea PMN nodule collection site in CCZ (ocean) • Unknown for undefined onshore facilities
• Regulating ESS	• i climate regulation	• On balance, expected indirect positive effects on climate regulation; also relevant to PS 3 effects on Climate Change • Potential localized impact to carbon sequestration: suggest minor impacts to carbon sequestration within manganese nodule fields coupled with potentially important impacts to primary production capacity[107].	• Additional availability of battery metals for supply chain enabling transition to low-carbon economy. • Localized carbon sequestration affects, if any, not expected to link with affects on socio-economic receptors (compared to positive contribution to decarbonizing EV/transport sector). • Opportunity costs: land-based mining features higher resources and GHG intensity.

[107] Beth N. Orcutt, James A. Bradley,William J. Brazelton,Emily R. Estes,Jacqueline M. Goordial, First published: 13 January 2020, https://doi.org/10.1002/lno.11403, accessed 4/14/2022

ESS Type	Specific examples cited in PS Guidance Notes	Applicability - Possible Impact	Linkage to Socio-economic Receptors
	• ii waste decomposition, detoxification • iii purification of water • iv control of pests • v natural hazard mitigation	• Not applicable/significant for DSM site in CCZ (ocean) • Unknown for undefined onshore facilities	• Not applicable to deep-sea PMN nodule collection site in CCZ (ocean) • Unknown for undefined onshore facilities
Cultural ESS	• i spiritual, sacred site	• Not present at Project site (see also PS7, PS8, page 49).	• Not applicable to deep-sea PMN nodule collection site in CCZ (approximately 700-1,700 km distance to UNESCO world heritage site or populated landmass, or further still to populated Pacific Island communities); although some possible effects/linkages postulated relating to, for example, cultural/spiritual connection with ocean and migratory species. Unknown for undefined onshore facilities.
	• ii tourism, recreation, hunting, fishing	• Not applicable/significant for DSM site in CCZ (ocean) • Unknown for undefined onshore facilities	• Not applicable to deep-sea PMN nodule collection site in CCZ • Unknown for undefined onshore facilities
	• iii scientific exploration, education	• Potential positive effects from furthering scientific knowledge of the deep oceans.	• Linkage to socio-economic receptors would include scientists/researcher, and knowledge gained for humankind.

ESS Type	Specific examples cited in PS Guidance Notes	Applicability - Possible Impact	Linkage to Socio-economic Receptors
Supporting ESS	• i nutrient capture, recycling	• Possible effects from physical change to mined ocean floor	• Though localized environmental effects expected, no discrete socio-economic linkages expected given depth, distances, relative size compared to size of abyssal planes, the presence of protected areas in CCZ (42%), and the size of the ocean.
	• ii primary production	• Potentially impacts to primary production capacity[108].	• Though localized environmental effects possible, no discrete socio-economic linkages expected given depth, distances, relative size compared to abyssal planes, the presence of protected areas in CCZ (42%) and size of the ocean.
	• ii pathways for genetic exchange	• N/A	• No discrete socio-economic linkages expected given depth, distances, relative size compared to abyssal planes, ISA-designated protected areas, and size of the ocean

[108] Beth N. Orcutt, James A. Bradley, William J. Brazelton, Emily R. Estes, Jacqueline M. Goordial, First published: 13 January 2020, https://doi.org/10.1002/lno.11403, accessed 4/14/2022

Annex 8: Applying IFC's sample indicators for incremental versus cumulative impacts to the Project

Project Aspect	Incremental Impact Indicator	Cumulative Impact Indicator	IFC PS	Relevance to NORI-D Project (Social)
Additional wage employment opportunities	• Incremental numbers of employed and unemployed, participation rates of affected population • Incremental value of subsistence income, wage, and other income to population	• Number, size, skill levels of regional labor force • Measures for shifts in livelihood and sustainability of livelihoods	1, 2	• No multiple, co-located, large construction camps. Offshore workforce is relatively small (650 for 3 offshore nodule collection vessels, 200 for transport vessels). No major changes or triggering thresholds expected to be reached. Siting of onshore/processing facilities unknown, future analysis required.
Addition of a pollutant to the environment (air, water)	• Concentration of the pollutant in the emission and/or discharge • Concentration relative to discharge standard • Load from the project • Characterization of the spatial • emission and/or discharge plume from the project	• Concentration of the pollutant in the receiving environment • Concentration relative to ambient standard • Total loading (from all sources) of the pollutant • Characterization of the spatial pattern of the concentration of pollutants in the downstream environment	3	• Some aspects may have relevance to livelihood-related ecosystem services, if indicated by the EIS, monitoring results from Collection Test (Q4/2022), or lab testing (bioavailability). Depth of nodules and distance to nearest social receptors (>700-1,700 km) may indicate cumulative social impacts not discrete/unlikely, requires further analysis. Siting of onshore processing facilities unknown, future analysis required.
Additional incidents of disease, alcohol and drugs problems, and crime	• Number of additional incidents of sexually transmitted diseases, alcohol and drug problems; crime rates	• Total number of incidents, proportion of population affected	4	• No major constructing camps or local communities at offshore nodule collection site. Siting of onshore/processing facilities

Project Aspect	Incremental Impact Indicator	Cumulative Impact Indicator	IFC PS	Relevance to NORI-D Project (Social)
	• Incremental changes to demands • on health, social, and policing services	• Measures for community and regional health and wellness; safety and security		unknown, future analysis required.
Loss of Land (land alienation)	• Area and/or proportion of land lost, damaged, or inaccessible because of the project • Incremental change in benefits of affected land users (e.g., lost agricultural production, subsistence • use)	• Total land area available, value of land use benefits • Total population affected • Measures for sustainable livelihood and poverty	5	• Offshore deep-sea PMN nodule collection does not feature local landowners or communities. However, connection of Pacific Islanders/Indigenous people to Ocean and its environs, and certain migratory species (intangible cultural heritage, ecosystem services). Siting of onshore processing facilities unknown, future analysis required.
Conversion or degradation of natural and critical habitat	• Area and/or proportion of natural and critical habitat converted and/or degraded because of the project • Incremental change in habitat quality and/or condition	• Total area of lost habitat • Change in rates of habitat loss • Measures of habitat fragmentation	6	• Some aspects may be relevant to livelihood-related ecosystem services. Needs analysis of Collector Test monitoring and plume-related data. Identification of valued social components for cumulative social impact analysis. Siting of onshore and processing facilities unknown, needs future analysis at a later date.
Regulation of downstream flows	• Percent reduction of downstream flows as compared to average annual flows	• River ecological integrity, including natural flow regimes (e.g., quantity,	1, 6	• Not readily transferable/applicable concepts considering open oceans, size of

Project Aspect	Incremental Impact Indicator	Cumulative Impact Indicator	IFC PS	Relevance to NORI-D Project (Social)
Reduction, modification, and/ or fragmentation of riparian and aquatic habitats	• Percent reduction of wetted perimeter or of usable habitat in the impacted river reaches • Connectivity from the river reaches upstream and downstream of the dam or weir	quality, seasonal variability, and predictability) • Viability of migratory fish populations		NORI-D, depths, and distances involved. Siting of onshore/processing facilities unknown, future analysis required at a later date.
Addition of mortality to a wildlife population	• Direct mortality caused by project operations over time • Percentage of local population (or range) lost with relation to global and/or regional population numbers (or range)	• Change in rates of regional and/or global population decline • Measures of population (or range) fragmentation	6	• Some aspects may have relevance to livelihood-related ecosystem services, incl. cultural significance of migratory species, if indicated by the Collector Test/EIA. Given size and location of CCZ, of which 42% protected, cumulative social/ESS impacts not expected to be discrete or reach significant livelihood threshold levels. Siting of onshore/processing facilities unknown, future analysis required.

Note: The table is based IFC's Good Practice Handbook: Cumulative Impact Assessment and Management. It provides examples of endpoints or indicators typically used on standard ESIAs vis-á-vis those that would be recommended or used in a CIA. The last column provides a preliminary analysis of the applicability or relevance to the NORI-D Project.