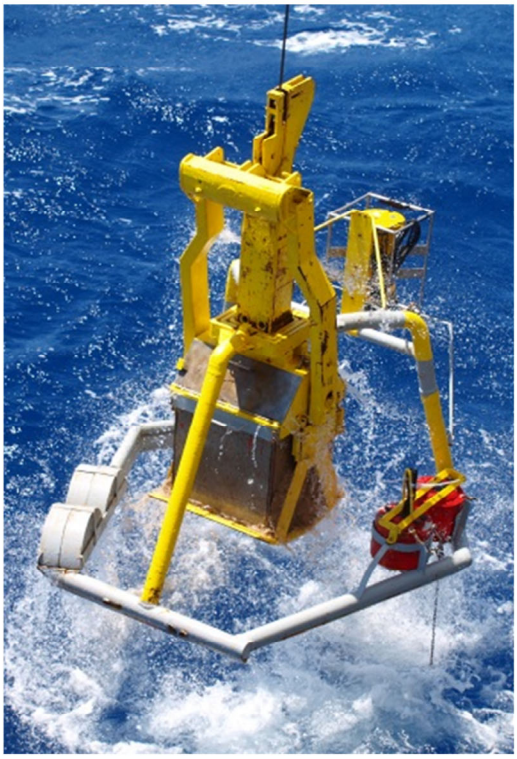
CIIC SEABED RESOURCES LTD

APPLICATION FOR EXPLORATION LICENCE – EEZ – THE COOK ISLANDS

Non-Technical Summary



Title:	Non-Technical Summary
Author:	Eusenio Fatialofa – GSR General Manager
Checked by:	Francois Charlet – CIIC-SR Exploration Manager
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Signed: ..... **On Behalf of: CIIC-SR**

Name: Eusenio Fatialofa..... Date: 24 October 2021

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1. Introduction

CIIC Seabed Resources (CIIC-SR) is a joint venture between Cook Islands Investment Corporation (CIIC - statutory Corporation of the Cook Islands Government) and Global Sea Mineral Resources Cook Islands (GSR-CI), owned by Global Sea Mineral Resources NV (GSR), part of the DEME-Group, located in Belgium.

The CIIC Seabed Resources Limited (CIICSR) is a Corporate Crown Entity and was established under the Companies Act 1970 on 2 November 2017 by the Ministry of Justice, Deputy/Register of Companies.

In 2019, CIIC-SR completed an offshore expedition in the Cook Islands EEZ to collect samples for further study. This was the first offshore research campaign to take place within the CI EEZ in decades. CIIC and GSR, both contractors in the Clarion-Clipperton Zone (CCZ) and have to date conducted six offshore exploration campaigns to evaluate polymetallic nodule resources, perform environmental research and test ultra-deep water seafloor nodule collector technology developed by GSR.

2. Partners

The partners (CIIC & GSR-CI) agreed to collaborate under the Subscription and Shareholders Agreement signed on 21 June 2016, on an exclusive basis. The JV agreement also states that the Agreement does not prohibit CIIC or any other agency of the CI Government from entering into arrangements within any area of the CI EEZ that is not within the CI EEZ reserved area for CIIC-SR.

Cook Islands Investment Corporation (CIIC)

The Cook Islands Investment Corporation (CIIC) is a statutory Corporation of the Cook Islands Government. CIIC was established in 1998 to manage Crown assets, including land and properties on Rarotonga and the outer islands, and manage Crown enterprises (subsidiaries, associates, SOEs, and Crown Controlled Entities) on behalf of the Crown.

Global Sea Mineral Resources Cook Islands (GSR-CI) / Global Sea Mineral Resources (GSR) / Dredging Environmental Marine Engineering (DEME)

GSR Cook Islands is a subsidiary company to Global Sea Mineral Resources (GSR), a deep-sea exploratory division of the DEME Group. DEME (Dredging Environmental and Marine Engineering) is a world leader in the highly specialised fields of dredging, marine engineering, and environmental remediation. The Group can build on more than 140 years of know-how and experience and has fostered a pioneering approach throughout its history, being a front-runner in innovation and new technologies.

3. Past Experience

In 2018, CIIC-SR applied for a research permit in order to visit the area under application and collect Polymetallic Nodule samples using free-fall grabs, a sampling device successfully used in the past to collect nodules. In September 2019, CIIC-SR completed its first deep-sea research expedition in the Cook Islands.

The offshore research campaign was a success, resulting in the collection of ~ 500kgs polymetallic nodules and providing a good initial assessment of the potential resource located in the area under application.

New vessel embarks on first deep sea research in decades

Monday 9 September 2019 | Published in Technology

Share

Four Cook Islanders are to be included in a research team embarking on an expedition to explore the seabed near Aitutaki this month.

Four Cook Islanders are to be included in a research team embarking on an expedition to explore the seabed near Aitutaki this month.

Preparing to embark on an exploration of the Cook Islands' seabed near Aitutaki are Junior Tapoki, from National Environment Service, and Rima Browne, an officer at the Seabed Minerals Authority. 19090868

Figure 1:Article published in the Cook Islands press before the departure of the 2019 CIIC_SR Offshore Research Campaign. (Cook Island News, 2019)

Based on this promising results of the first research expedition, CIIC-SR decided to apply for a 5-year plan of work for exploration to obtain a contract from the Cook Islands Seabed Mineral Authority (CI SBMA), in this specific reserved area, within the Cook Islands Exclusive Economic Zone (EEZ).

CIIC and GSR, both contractors in the Clarion-Clipperton Zone (CCZ) have to date conducted seven offshore exploration campaigns to evaluate polymetallic nodule resources, perform environmental research and test ultra-deep water seafloor nodule collector technology developed by GSR.

4. Location and boundaries (blocks) – Map of the blocks

The Area under application is approximately 500-700km North of the main island Rarotonga, at water depths between 4,800 m and 5,300 m. The approximate center of the area is15.5° S, 159.4° E (Table NTS-1). The area is near the CI EEZ eastern boundary and includes samples collected within international waters. However, the license assessed for seabed manganese/polymetallic nodules and associated minerals are located wholly within the CI EEZ.

In order to better define areas under application, the entire Cook Islands EEZ has been divided into blocks of 5 minutes x 5 minutes, using the projected coordinate system (WGS_1984_UTM_Zone_S4). The CIIC-SR blocks under application is located outside the Marae Moana 50 NM exclusion zone around the fifteen islands of the Cook Islands. In total, CIIC-SR would like to apply for the 262 blocks constituting the reserved area under application with a total surface area estimated to be 19,479 km^2.

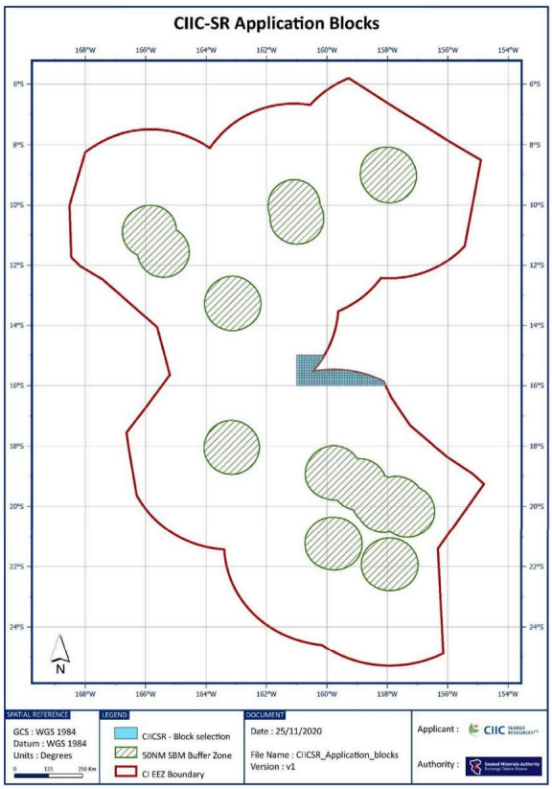

Figure 2: Map of the Cook Islands Exclusive Economic Zone, including the CIIC-SR Application Blocks

Table 1: Coordinates of the CIIC-SR Research Area.

	Latitude	Longitude
Minimum coordinates	-17.1° S	-161.2° E
Maximum coordinates	-14.9° S	-157.9° E

5. Exploration Work Plan

CIIC-SR has developed a Work Plan for exploration over a 5-year period, divided it into three conceptual phases with each phase of works building on the previous phases (Figure 3). This ensures a methodical and step-by-step program easing the understanding and adaptive management.

The three-phased approach is to firstly define the high-level environmental baseline conditions, with a focus on resource definition and oceanography studies. This will be developed over the two first offshore expeditions and shall inform (1) the subsequent detailed baseline characterization (phase 2) and (2) the optimization and monitored trial of the pre-prototype mining technology (phase 3). Through the second and third phases of exploration, further detailed information shall continually be gathered to build a sound baseline data set of information and supporting scientific studies. This detailed programme shall feed into both the technological design and development processes and into the understanding of potential environmental impacts.

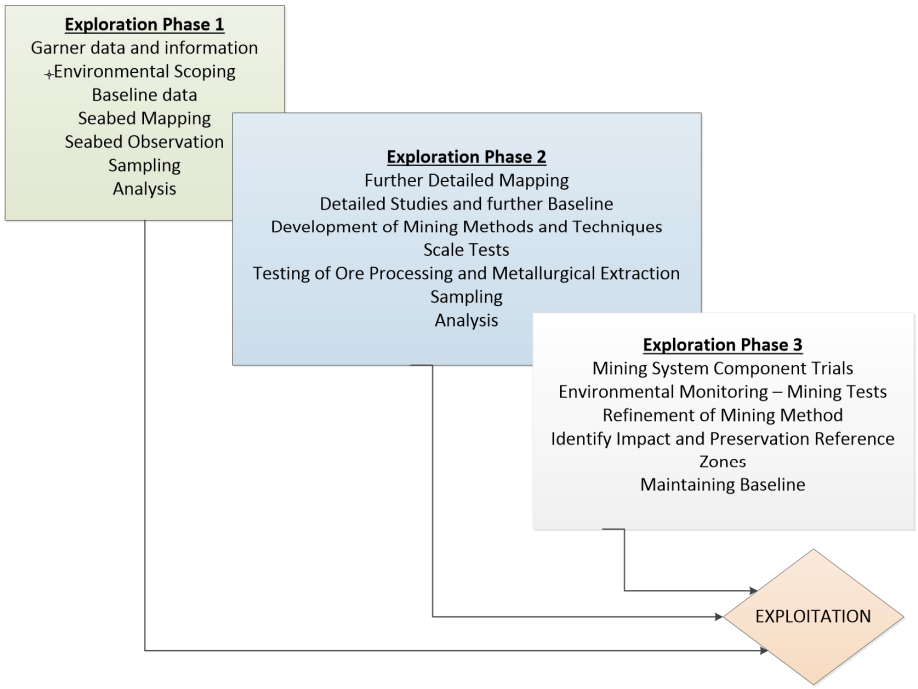

Figure 3: Three conceptual phases of the CIIC-SR 5-year Exploration program.

The CIIC-SR proposed Work Plan will aim to:

- Improve confidence in the polymetallic nodule (PMN) resource from the “inferred” to the “indicated” and “measured” level of confidence in a specific area, using geophysical information (e.g., side-scan sonar, multibeam/backscatter), HD imagery from the seabed, validated with physical samples (e.g. box-corer and free-fall grab samples) collected with adequate spacing to allow strong statistical power;
- Apply a high environmental standard – at least as high as that requested by the CI SBMA (and aligned with the ones already defined by the International Seabed

Authority for the Area) to study the baseline environmental conditions and conduct an Environmental Impact Assessment (EIA) and Environment Impact Statement (EIS).
- Develop a sediment plume model specific to the and evaluate the sediment plume dispersion using a pre-prototype ultra-deep water seafloor nodule collector.
- Collect enough geotechnical and engineering information to evaluate the feasibility of future mining in the area under application.
- Conduct studies to support a future application for a mining license under the Act;
- Build capacity within Cook Islands in areas relevant to the marine minerals sector.

6. Resources/Reserve

Historical data and initial sampling have helped to provide an initial estimate of the extent of the resource. Additional sampling will be carried out in the license area to further increase the understanding of the resource throughout the Exploration work plan. It is anticipated that the preferred sampling apparatus for resource work will be a box corer. Sample weights will allow for the extrapolation of nodule abundance, which will be reported as mass of nodules per unit area (kg/m2). Empirical sampling and the use of geo-statistics will allow CIIC-SR to establish the resources to inferred, indicated and measured levels of confidence.

7. Indicative planning overview & timing for committed and contingent exploration work and subsequent analysis and reporting

The five-year CIIC-SR program is based on the execution of three (3) offshore expeditions in the CI EEZ. The proposed planning below has been established, considering the long-term schedule of DEME/GSR within the coming years, and the integration of specific milestones, such as the deployment of the PPV Patania II in the International Waters in 2021. It also considers the experiences gathered by GSR and CIIC in the CCZ and the needs of a structured, logical and consistent sequence of activities, starting with the geological knowledge of the area under application (resource estimation) to the detailed assessment of environmental parameters.

Due to the time needed for the Authority to review the Application, CIIC-SR has needed to update the program and schedule. An updated schedule of the CIIC-SR exploration plan is provided below in figure 4. The cost expenditures estimated by CIIC-SR have also been adapted accordingly.

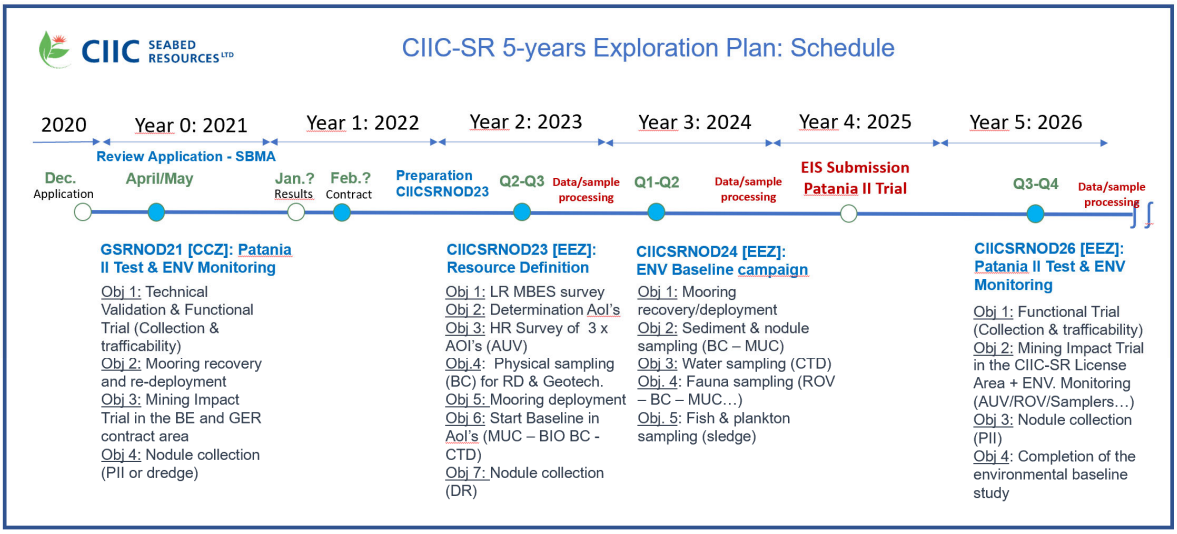

Figure 4: Indicative schedule of the Plan of Work that CIIC-SR is attempting to cover during the 5-year exploration period.

The proposed plan of work included the Patania II Test & Environmental Monitoring in April and May 2021, with the trial of the pre-prototype vehicle Patania II at 4500m water depth on the seafloor of the Pacific Ocean, and the environmental monitoring of small-scale mining operations to study the impacts on the marine environment. Even those this trial will not take place in the CI EEZ, it will bring valuable knowledge and lessons learned with respect to the operational, technical, and environmental aspects.

After acceptance of the CIIC-SR application, the next 12 months will be dedicated to the data processing and the preparation of the offshore campaign 2023 [CIICSRNOD23] in the CI EEZ.

The first offshore campaign in the Cook Islands EEZ will be dedicated to the geological study of the seafloor environment, the resource mapping, the collection in large quantity of PMN, the HR geophysical mapping of (x3) Areas of Interest, the collection of physical samples and the deployment of environmental moorings to study oceanographic currents characterising the EEZ and more specifically the area under application.

In between CIICSRNOD23 and CIICSRNOD24, CIIC-SR will focus on the data processing, desk study and on the preparation of the 2024 offshore campaign.

CIICSRNOD24 will dedicate most of the ship time (2 x 25 days on site) to the environmental baseline study. To achieve these goals, CIIC-SR is looking to collaborate with an international team of scientists and experts. Two offshore legs will be necessary to deploy all systems and devices necessary to obtain data and samples.

The fourth year of the exploration contract will be dedicated to the elaboration of the Environmental Impact Statement for the deployment and environmental mining impact trial carried out with the GSR pre-porotype Patania II. The document is expected to be submitted to the Authorities (CI SBMA and National Environmental Service) during the second part of 2025, to proceed with the trial during Q3 or Q4 2026. CIIC-SR considers a period of 1 year for the Authorities and stakeholders to study the EIS deliverables.

If the plan of work is approved by the CI Authority, CIIC-SR will proceed with the preparation and execution of the offshore campaign CIICSRNOD26, also composed by 2 legs of approximatively 25 days on site, with a first leg dedicated to the environmental baseline study, and a second leg more focused on the mining trials with PPV Patania II.

In total, during this 5-year exploration plan of work, CIIC-SR is looking to perform 25 operational days on site dedicated to resource assessment and preliminary environmental studies, 75 days of pure environmental baseline studies and 50 days of technical performances and mining impact monitoring. The program will be completed by intensive desk study, laboratory analyses, trainings, and preparation of offshore exploration campaigns.

CIIC-SR is dedicated providing to the CI Seabed Minerals Authority, its annual report summarizing all achieved work performed during the preceding contractual year, which include all technical, environmental and resource milestones, according to the template developed by the ISA in ISBA/21/LTC/15 or any template submitted by the Cook Islands Seabed Minerals Authority.

Meanwhile, CIIC-SR will support all scientists involved in the exploration project to produce peer-reviewed scientific papers, to be published in international journals, in sake of total transparency regarding environmental-related topics.

8. Environmental Management Programme

The proposed methodology, to be applied by CIIC-SR for the 5-year exploration, is based on 6 recommended study areas for the baseline study and EIA recommended by the International Seabed Authority (ISA). CIIC-SR will follow the ISA guidance and regulations in place to study all environmental-related topics:

- Physical Oceanography
- Geology, including Sediment Properties
- Chemical Oceanography
- Biological Communities
- Bioturbation (activities in the sediments)
- Fluxes to Sediment (sedimentation)

CIIC-SR is committed to an inclusive, transparent multi-stakeholder, responsible approach to environmental planning and management. CIIC-SR will partner with the scientific community to design and conduct baseline studies and complete the Environmental Impact Assessment culminating in an Environmental Impact Statement.

Table 2: Summary of the proposed CIIC-SR environmental work program (list is not exhaustive).

DATA CATEGORY	DETAILS*
Physical Oceanography	**Information requirements:** pressure, current profile, temperature, salinity and turbidity, particle concentration and composition, etc. **Sampling/measurement design:** adapt to geomorphology of seabed and hydrodynamic process from surface to seafloor, at depths likely impacted by plumes, sufficient temporal and spatial resolution, etc. **BATs and methodologies:** ADCPs, sediment traps, CTDs stations, moorings, satellite data for surface water, circulation model coupled with sediment transport model, etc.
Chemical Oceanography	**Information requirements:** water column chemistry, oxygen concentration and profiles, pH and carbonate, organic matter, etc. **Sampling/measurement design:** same locations as physical oceanography measurements, vertical profiles and temporal variation assessed **BATs and methodologies:** confirmation with existing standards, model the time-scales of test-mining by-product, etc.
Geological properties	**Information requirements:** high-resolution, multi-beam bathymetric data, sediment properties (including pore water chemistry) collect information on the potential for heavy metal and trace element release during full-scale mineral operations, etc. **Sampling/measurement design:** determine heterogeneity of the environment and assist the placement of suitable sampling locations. **BATs and methodologies:** geochemistry of sediments and porewater determined to 20 cm, or depth of removal by mining, whichever is deeper, etc.
Biological Communities	**Information requirements:** seafloor and near-bottom communities including microfauna, meiofauna, macrofauna, megafauna, demersal scavengers and fauna associated with resource, pelagic communities (water column and near bottom), baseline tissue metal concentrations, marine animal and surface animal observations, regional distribution/genetic connectivity studies, etc. **Sampling/measurement design:** use biometric map to plan sampling design, samples representative of habitats, bottom topography, depth, seabed and sediment characteristics, the water column and mineral resources being targeted, establish time series, etc. **BATs and methodologies:** Photographic/video transects and animal sampling, use of multi corer, box corer, moored time lapse cameras, plankton nets, AUV/ROV and other methods, DNA sequencing, taxonomic standardization, etc.
Bioturbation	**Information requirements:** rates and depth of bioturbation **Sampling/measurement design:** spatial and temporary variation **BATs and methodologies:** multi cores, Pb-210 analysis, sediment imaginary, etc.
Fluxes to Sediment	**Information requirements:** time series data on the flux and composition of materials from the upper water column to the deep sea. **Sampling/measurement design:** deployments may share the same moorings as current meters if practical, temporal resolution of the particle-flux measurements must be one month or better and nephelometry time series should be recorded on the sediment traps, etc. **Study requirements:** moorings with sediment traps be established, with one trap below 2000 m, one approximately 500 m above seafloor and one 10 m above seafloor, for a suitable period (e.g. covering seasonal variability), etc.

Each of these studies requires specific equipment, protocols, and effort requirements and these environmental-related topics have been incorporated and spread over the three offshore expeditions that CIIC-SR is planning to perform in the area under application, between 2023 and 2026. As such, CIIC-SR hopes to fulfill all the conditions established in the laws of the Cook Islands, and more specifically regarding the Environment Act 2003 et Marae Moana Act 2017and the principles of ecologically sustainable use.

It is generally recognized that a key environmental management strategy for polymetallic nodule provinces is the establishment of a network of set-aside areas across the provinces that contain representative habitats and biota of that which will be impacted by mining. CIIC-SR will establish one or more biological reference areas within the license area, with the aim of preserving habitats and biota representative of what will be impacted by mining. How many and how large these reference areas are will be determined during the exploration program.

9. Environmental Impacts and proposed mitigation

A key objective of the environmental program of the exploration phase is to develop an Environmental Impact Assessment (EIA), Conducting an environmental impact assessment (EIA) which will define the expected environmental effects from a trial test of nodule extraction operation, including evaluating and developing ways to prevent or otherwise minimize impacts as far as possible to the environment. During exploration, the baseline environmental conditions will need to be understood and an environmental impact assessment will need to be completed to assess the likely impacts and effects a mining operation will have on the environment.

CIIC-SR will work with various stakeholders, including scientific experts and the Cook Islands Government, to develop impact minimisation and mitigation strategies and responsible environmental management measures. Unless advised that another approach

is preferred, CIIC-SR intends to follow the EIS template of the draft ISA regulations when developing its EIS(s).

The focus of the exploration is to gather data, whilst having the less amount of impact on the seafloor and its biological community. For this reason, CIIC-SR has investigated the potential environmental impacts for each of the foreseen offshore activities and as defined some mitigations when it was conceivable (Table 3).

10. Impacts due to baseline characterization operations

Table 3: Expected environmental impacts and proposed mitigation

BATs and methodologies	Environmental Impact	Mitigation	Reference
Exploration vessel (Light)	Light can be an attractant to birds, fish, sharks, cephalopods and marine mammals.	This impact will be more important at night, in response the crew will limit deck lights as much as possible.	(Cronan, 2013)
Exploration vessel (Noise - vibrations)	The acoustic impact of vessels can affect the behaviour of large animal.	The short-term nature of the exploration campaigns will limit the impact	(Cronan, 2013)
Multibeam eco sounder	Low environmental impact	Optimize the survey plan to avoid focusing on the same area too long. “Soft” start to “inform” potential mammals around the vessel.	(Seabed Minerals Authority, 2019)
Dredge (sediment resuspended) & epibenthic sledge	Low environmental impact if remains under 10,000 m²		(Seabed Minerals Authority, 2019)
Multi- and box-core (sediment resuspended)	Very low environmental impact		(Seabed Minerals Authority, 2019)
High resolution AUV survey (Noise and vibration-	Acoustic impact	Limit the time spent on site	
Mooring deployment	Low environmental impact		(Seabed Minerals Authority, 2019)
Moored Time Lapse Camera or Lander	Low impact, confined to where lander/camera have contact with seafloor, no more than 2 m x 2 m		
Water sampling and profiling (Niskin bottles, CTD)	Negligible, no impact to seafloor, short-term presence of wire and instrumentation in the water column	N/A	
ROV	Very low, confined to limited removal of individual animals.	Standard procedures in place for equipment recovery, use of biodegradable hydraulic fluid, standard procedures for umbilical management, standard ROV procedures and operations	
Plankton Nets/Fishing Gear	Negligible, no impact with seafloor, short term presence of sampling devices in the water column	N/A	

Potential biological impacts at the surface can be due to accidental discharge (hydraulic fluids and hydrocarbon spills) and waste from surface vessel, noise and light pollution. To be able to counter these environmental effects, the vessel policy will strictly follow IMO

obligations and standards regarding safety and environmental practice at sea (e.g., MARPOL). The crew will be trained in marine pollution emergency response plan (Cronan, 2013) and offshore emergency drills will be carried out frequently.

11. Impacts due to the use of the PPV Patania II for exploration (CIICSRNOD26)

Comparing the similarities between Cook Islands and CCZ nodules fields (soft sediment, low deep-sea currents, deep-waters…), we can assume that the environmental effects and mitigation strategies will be similar for both locations. The Patania II trials in both the CCZ and Cook Islands EEZ offer an important opportunity to validate and where needed improve predictions and assess the environmental effects that may result from potential future nodule mining operations on the seabed.

The types of physio-chemical environmental effects of nodule removal from the seafloor that potentially might occur during the GSR exploration are:

- habitat/nodule removal;
- sediment disturbance and plume formation;
- biogeochemical alteration of the sediment (i.e., change of habitat integrity);

To assess these effects, a 3D hydrodynamic and sediment transport model will be developed to understand & restrict the impact of the resuspension of the sediment. Furthermore, an in-depth environmental monitoring program will be developed. The details of the model and monitoring, as well as a complete list of environmental effects expected from the sediment plume on the physio-chemical environment and the biological communities, will be described in the Environmental Impact Statement (EIS) to be submitted before the technical trials.

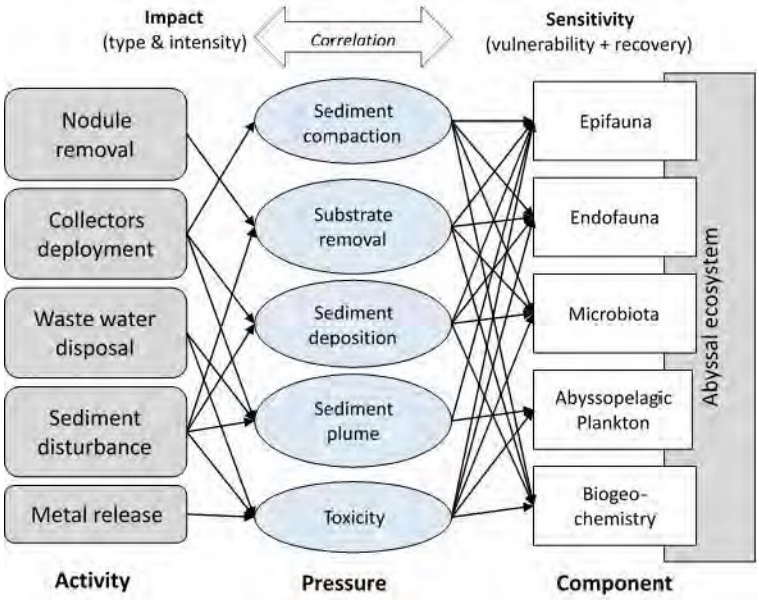

Figure 5: Generic outline for cumulative effect assessment of potential future mining-related activities that may generate pressures on different ecosystem components. The conceptual scheme visualizes potential relationships between impact intensity and sensitivity that need to be assessed (GSR, 2018).

12. Benefits to the Cook Islands

The business partnership between Global Sea Mineral Resources–Cook Islands (GSR-CI) and Cook Islands Investment Corporation (CIIC) is based on mutual benefit, with an aim to be a leader of the sector within the Cook Islands by developing best practice deep-sea technologies and methodologies. The relationship is also based on providing development opportunities for Cook Islanders, by developing career and providing training opportunities. Several mission statements have been developed by CIIC-SR:

- **Acting in the best interests of the Cook Islands nation,** the environment, and its people, by acting in a responsible and ethical manner with integrity and transparency;
- **Acting in an environmentally and socially responsible way,** in collaboration with well-known universities and international experts,
- **Use of innovative technologies,** integrating environmental sensors for optimal manoeuvrability and production efficiency of a Seafloor Nodule Collector (SNC), in relation to the dynamic response of a Surface Operation Vessel (SOV) connected through a ~5 km riser. AUV/ROV equipment and environmental moorings will monitor the environmental impact, before, during and after the deep-sea operations in a specific mining field and adapt the mining production accordingly.
- **Investing, training, and developing Cook Islands staff:** CIIC-SR is committed in the professional development of Cook Islanders (in particular students and young workers).
- **Long term sustainable returns:** the organization is focused on generating a long term returns for the involved trainees in their future professional life, and for the development of the Cook Islands.
- **Contribution to the CI Government Priorities –** defined as objectives (transforming economy, developing people & culture, greening the economy, investing in our Islands.

The cost expenditures estimated by CIIC-SR have also been adapted accordingly.

Exploration and Environmental work programs		
Year 1:	*Preparation of the offshore campaigns and scientific studies.*	$ 255,000
Year 2:	*1st offshore expedition CIICSRNOD23 (Resource and baseline study) + post-study*	$ 14,964,058
Year 3:	*2nd offshore expedition CIICSRNOD24 (Env. baseline study) + post-study*	$ 15,804,920
Year 4:	*Desktop and laboratory studies*	$ 3,865,363
Year 5:	*3rd offshore e testing of collector systems and equipment + env monitoring*	$ 20,512,167
	Total (NZD millions):	**$ 55,401,508**

Table 4: Indicative Exploration and Environmental 5-year Work Program Budget

CIIC-SR wishes to emphasize that it considers the plan of work for this five-year exploration period and the projected concomitant investment to be contingent on:

- the satisfactory progress of the regulations on exploitation;

- the PMN resource availability;
- the strategic partnership of CIIC-SR and its affiliates, and
- the metals market within the next coming years.

The financial table outlines the anticipated yearly expenditure for the five-year program of activities. This is an estimate based on experience in offshore operations. CIIC-SR will aim to optimize this expenditure. Optimization includes shared working with other contractors operating in the Cook Islands EEZ, where this may be mutually beneficial.

13. Viability of the project

Numerous studies show that even with greatly expanded recycling. Demand for critical metals will far outstrip existing terrestrial supply over the next dew decades due to the development of clean energy technologies and a rapidly expanding urban population (See Box 1). Furthermore, significant amounts of potentially recyclable metals are currently trapped in the infrastructure and other durable goods, meaning increased recycling may not be feasible nor yield the volume needed in the short term.

Box 1. Need for Critical Metals

Global Issue: According to the UN, cities account for 78% of global energy consumption and more than 60% of global greenhouse gas emissions. By 2100 there will be almost 11 billion people on the planet and 68% of that population will live in urban areas2. This means the number of city dwellers will increase from 4.2 billion today to 7.3 billion by the end of the century.

This puts a large amount of pressure on already strained resources. Investment in low-carbon infrastructure willbe critical to economic growth and sustainable development and will have a major impact on demand for specific metals.

Cobalt is critical for clean energy technologies such as wind turbines, solar panels, electric vehicle batteries and other energy storage devices. The World Bank forecasts that, in a scenario where climate change is limited to +2°C, demand for cobalt, will rise by more than 1,000% by 20503. This is to build the required electric storage batteries alone. Similarly, the Institute for Sustainable Futures calculates that in a scenario where global temperature rise is limited to less than 1.5°C, demand for cobalt will be four times greater than reserves4 by 2050. This is just demand from renewable energy and storage.

The most recent report from the Intergovernmental Panel on Climate Change (IPCC) estimated that 70% to 85% of our energy supply must come from renewable sources by 2075 if we are to meet the 2°C climate target. To achieve this, the IPCC calculates that we need a fivefold increase in investment in renewables and energy storage6 and these technologies depend on metals such as cobalt, which is the metal found in abundance in the seafloor nodules of the Cook Islands EEZ.

1 UN Habitat
2 The UN World Population Prospects, UN, 2019 and The UN World Urbanisation Prospects, 2018
3 The Growing Role of Minerals and Metals for a Low Carbon Future, World Bank, 2017
4 Reserves are defined as the estimated amount of a mineral that can be economically mined under current conditions.
5Responsible Minerals Sourcing for Renewable Energy, Institute for Sustainable Futures, 2019
6 Global Warming of 1.5 ºC, IPCC, 2019
8 Deep-ocean mineral deposits as a source of critical metals for high-and green-technology applications: Comparison with land-based resource'; Hein et al, 2013

There is no clear pathway to a technologically engineered future which sees metal demand decrease. All the evidence points to a future in which demand for nickel, manganese, cobalt, and other critical metals will grow dramatically. Without enough of these critical

metals in the global supply chain there is no chance of meeting climate change targets while meeting societal needs for access to energy.

Additionally, as demand for minerals escalates it will be increasingly important to maintain a diversity of supply. Alongside the responsible mining houses, CIIC-SR sees seabed minerals providing a responsible source of much-needed metals. Most of the the world's cobalt is currently mined from the Democratic Republic of the Congo (DRC), a country with a history of conflict, instability and human rights issues, including specifically related to mining cobalt (e.g., child labour). This project will help to provide an alternative, responsible, supply of cobalt. Given the demand for cobalt is on the rise, it is anticipated that the price of cobalt will also rise. CIIC-SR's initial estimates are that the overall economic viability will be positive for both CIIC-SR and the Cook Islands.

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