

# CIIC Seabed Resources Limited

## 20/21 Application for a seabed minerals exploration licence

Short Public Summary Version 1

Application Details	
Stage of Activity	Exploration
Name of Applicant	CIIC Seabed Resources Limited
Parent Company Names	Global Sea Mineral Resources NV (operator), Cook Islands Investment Corporation and Global Sea Mineral Resources Cook Islands
City and Country of origin	Zwijndrecht Belgium, Rarotonga, Cook Islands
Past experience(s)	CIIC Seabed Resources (CIIC-SR) is a joint venture between Cook Islands Investment Corporation (CIIC – a 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. 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 Cook Islands Exclusive Economic Zone (CI EEZ) in decades. CIIC and GSR, both contractors in the Clarion-Clipperton Zone (CCZ), have to date conducted six offshore exploration campaigns in the CCZ to evaluate polymetallic nodule resources, perform environmental research and test ultra-deep water seafloor nodule collector technology developed by GSR.
Area of application	
Summary of area and number of blocks applied for	19,479km <sup>2</sup> 262 blocks
Licence term applied for	5 years
Map of exploration area	

# 1. Exploration Work Plan

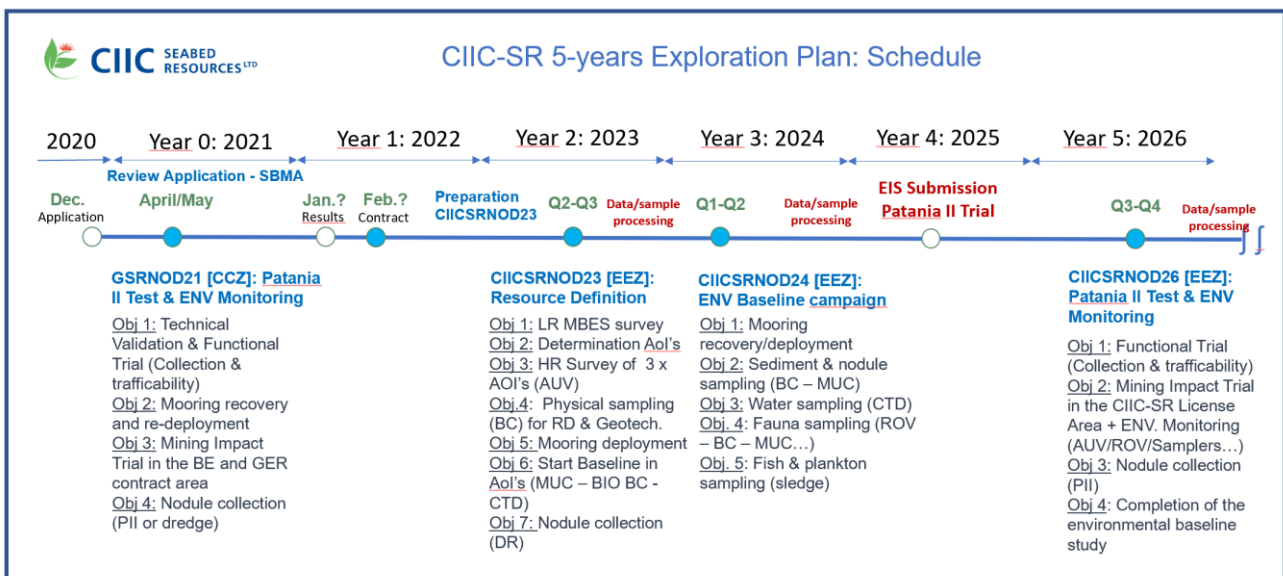
The objective of the Exploration Work Plan is to develop a sound research framework focused on the collection and processing of baseline information related to the geological, oceanographical, and environmental conditions of the area under application. All work shall contribute to the end goals, which are:

- the characterization, understanding and mapping of the benthic and pelagic environment,
- the evaluation of the PMN resources available and,
- the assessment of the mining impacts on the surrounding environment and ways that these impacts can be mitigated (following the mitigation hierarchy of avoid, reduce, rehabilitate, offset) and monitored.

The 5-year exploration period is divided into 3 conceptual phases with each phase of works building on the previous phases. This ensures a methodical and step-by-step program, incorporating learnings into the next phase.

Phase 1 of the three-phased approach involves defining 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 Phase 2 involving detailed baseline characterization and Phase 3, entailing the optimization and monitored trial of the pre-prototype mining technology. 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 and effects and how best to mitigate them, following the mitigation hierarchy mentioned above.

The five-year CIIC-SR program is based on three (3) offshore expeditions in the CI EEZ for 2023, 2024 and 2026:



## 2. Environmental Management Programme

The environmental management programme objectives for the exploration activities are:

1. to establish and implement a proposed programme of work for environmental baseline studies; and
2. environmental assessment and management of potential environmental impacts of exploration activities on the marine environment.

### Environmental Baseline Studies

Baseline data collection and monitoring studies are essential aspects of CIIC-SR's exploration activities. The baseline surveys and targeted scientific studies are needed to better describe and characterize the receiving environment and some monitoring of conditions over time to understand the temporal variability of some key environmental factors before any likely recovery exploitation. The proposed methodology, to be applied by CIIC-SR for the 5-year exploration, is based on 7 recommended study areas recommended by the International Seabed Authority.

Such studies will need to cover a wide range of research aspects.

Physico-chemical assessment	Oceanography assessment	Biological Assessment
<b>Geology</b> <ul style="list-style-type: none"> <li>- Topography</li> <li>- Map generation</li> <li>- Sub-seafloor</li> <li>- Petrology, Mineralogy, and geochemistry</li> </ul>	<b>Physical oceanography</b> <ul style="list-style-type: none"> <li>- Currents (including flow dispersal)</li> <li>- Hydrodynamic modeling</li> <li>- Water quality</li> <li>- Visual characteristics</li> </ul>	<b>Seafloor community</b> <ul style="list-style-type: none"> <li>- Megafauna</li> <li>- Macrofauna</li> <li>- Meiofauna</li> <li>- Microbiota/microbes</li> <li>- Resource-specific fauna</li> <li>- Demersal scavengers/ fish</li> </ul>
<b>Sediment Characteristics</b> <ul style="list-style-type: none"> <li>- Sediment properties and composition</li> <li>- Bioturbation rates</li> <li>- Sedimentation rates</li> </ul>	<b>Chemical oceanography</b> <ul style="list-style-type: none"> <li>- Bottom water chemistry</li> <li>- Water column chemistry</li> </ul>	<b>Pelagic and Surface community</b> <ul style="list-style-type: none"> <li>- Surface</li> <li>- Midwater</li> <li>- Deepwater</li> <li>- Marine mammals, birds</li> </ul>

*\*note: list is not exhaustive*

### Environmental Impacts and proposed mitigation

The focus of the exploration is to gather data with minimal environmental impact. CIIC-SR has investigated the potential environmental impacts for each of the foreseen offshore activities – which align with techniques used by the marine scientific research community - and defined some mitigations where conceivable.

Exploration Equipment	Environmental Impact	Mitigation
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, to safe working limits.
Exploration vessel (Noise - vibrations)	The acoustic impact of vessels can affect the behaviour of surface animals (either avoidance or attraction).	The short-term nature of the exploration campaigns will limit the impact
Multibeam eco sounder	Low noise levels, 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.
Dredge (sediment resuspended) & epibenthic sledge	Removal of seafloor substrate.	Sample only what is necessary, make the most of each sample. Sampling events under 0.01 km <sup>2</sup> , or have an EIA/EIS .
Multi- and boxcore (sediment resuspended)	Very low environmental impact	Sample only what is necessary, make the most of each sample (i.e. conduct as many studies as possible on each sample taken)
High resolution AUV survey (Noise and vibration)	Acoustic impact (minimal-low impact)	Limit the time spent on site
Mooring deployment	Low environmental impact, limited to the footprint of the mooring weight on the seafloor and presence of the mooring and oceanographic equipment in the water column.	Avoid placement of mooring blocks on biologically-special areas, if present.
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	Avoid placement on biologically-special areas, if present.

Exploration Equipment	Environmental Impact	Mitigation
Water sampling and profiling (Niskin bottles, CTD)	Negligible, no impact to seafloor, short-term presence of wire and instrumentation in the water column	None.
ROV	Very low, confined to limited removal of individual animals.	Sample only what is necessary, make the most of each sample (i.e. conduct as many studies as possible on each sample taken)

### 3. Benefits to the Cook Islands

The business partnership between GSR-CI and Cook 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, in relation to the dynamic response of a Surface Operation Vessel connected through a ~5 km riser. Monitoring of impact, before, during and after the deep-sea operations, adapting 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.

Exploration and Environmental work programs		
Year 1:	Preparation of the offshore campaigns and scientific studies.	\$ 0.3M
Year 2:	1 <sup>st</sup> offshore expedition CIICSRNOD23 (resource and baseline study) + post-study	\$ 15M
Year 3:	2 <sup>nd</sup> offshore expedition CIICSRNOD24 (environmental baseline study) + post-study	\$ 15.8M
Year 4:	Desktop and laboratory studies	\$ 3.9M
Year 5:	3 <sup>rd</sup> offshore e testing of pre-prototype collector vehicle PATANIA II and equipment + env monitoring	\$ 20.5M
<b>Total (NZD millions):</b>		<b>\$ 55.4M</b>

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 extensive experience conducting similar offshore operations. CIIC-SR will aim to optimize this expenditure. Optimization includes shared working with other contractors operating in the CI EEZ, where this may be mutually beneficial.