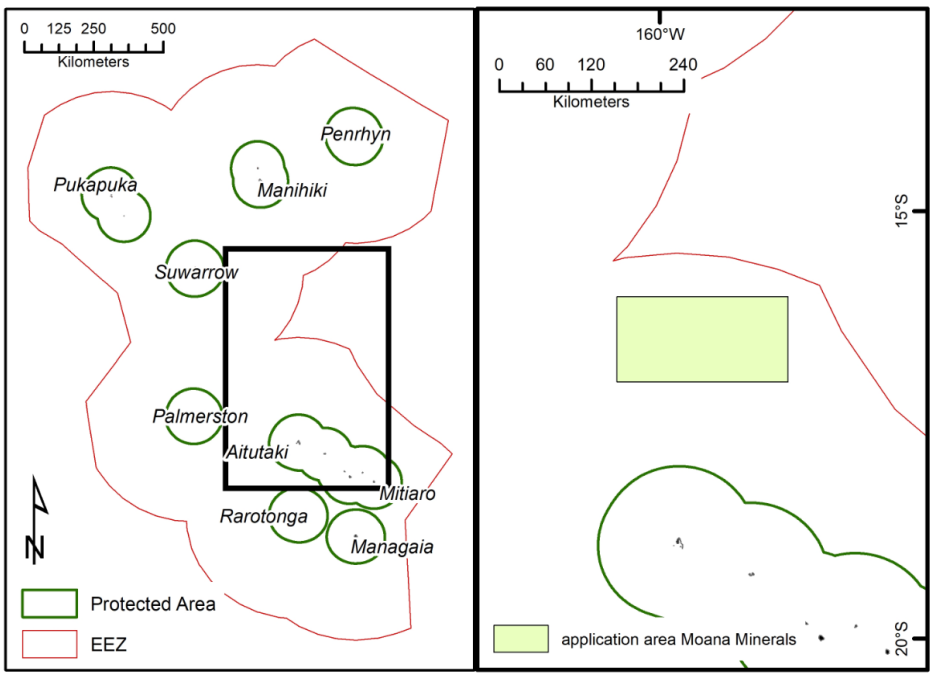
Moana Minerals Limited

20/21 Application for a seabed minerals exploration licence

Short Public summary version 1

Application Details	
Stage of Activity	Exploration
Name of Applicant	*Moana Minerals Limited*
Parent Company Name	*Ocean Minerals, LLC*
City and Country of origin	Houston, Texas, United States of America.
Past experience(s)	25 December 2019 – 2 January 2020 OML (Moana Minerals' parent company) research cruise to recover small amounts of nodules and environmental data (using free fall grabs). The objectives of the research cruise included collecting nodule samples, seafloor imagery, taking small sediment and nodule rinsate samples, and recording environmental observations from reserved areas in Cook Islands Exclusive Economic Zone (CI EEZ). The Science team has extensive experience as part of numerous marine environmental and mineral exploration projects within territorial and international waters. Members of the engineering team have participated in various marine mining projects over the past 40 years.
Area of application	
Summary of area and number of blocks applied for	*23,630 km^2* *288 blocks*
Licence term applied for	*5 years*
Map of exploration area	

1. Exploration Work Plan

Moana Minerals' Exploration Work Plan (EWP) Key Objectives:
• Understanding the environment and ecosystem functions in our application area and beyond
• Understanding the physical nature of the nodule resource and its setting
• Determining the extent of environmental and social impacts of proposed activities
• Developing systems to harvest nodules without causing serious environmental harm
• Ensuring our activities benefit the Cook Islands and its communities

To collect the necessary data to meet these objectives, we will engage in a program of geological and environmental studies spanning multiple expeditions over at least 3 years:

Remote Sensing	Physical Sampling
sonar systems seafloor mapping, bathymetry, sediment properties and structure, habitat classification	***water column properties*** continuous data collection using moored sensors; sediment traps; water samplers
underwater imagery photography and video	***nodules properties*** grab samplers, box corers, minimal dredging
satellite sensors oceanic setting, indicators of production, seasonal and decadal variability	***sediment properties*** box core sampling, coring, landers
surface megafauna moored and drifting hydrophones detecting whale vocalisation, voyage observations	***seafloor animals and other life (biology)*** box core sampling, multicore sampling, landers, imagery, traps and nets, microbial to megafauna size ranges, biogeochemistry

These methods will be used to map and visualise the seabed, and to study the physical, chemical and biological components of the ecosystem from the seabed to the surface and improve our understanding in the nodule resource size, structure and economic potential.

Frequent and repeated campaigns to collect data over multiple seasons is accomplished through:	
• use of Cook Islands based vessels	• capacity build to develop local team
• maximise Cook Islanders as crew	• collect multiple data in parallel
• training and mentoring programs	• assess/mitigate potential impacts

Moana Minerals' team includes offshore, deep-water engineering, and operations experience in	
• deep-sea ecology	• deep-water oil and gas drilling
• seabed minerals exploration	• environmental impact assessment
• seabed diamond mining	• social impact assessment

Specifically, some team members were, and remain part of the research, exploring and operations in the manganese nodule fields of the Clarion Clipperton Zone (CCZ); placer diamonds in the oceans off the coast of Southern Africa; placer gold deposits in waters of New Zealand, Chile and Alaska; and SMS deposits in the waters of the south-western Pacific Ocean regions.

Using our team's experience and knowledge in studying other nodule habitats, we will apply lessons learned to the unique environment and cultural setting of the Cook Islands.

The Moana Minerals team is supported by a large sphere of global partners and service providers in areas of logistics, community consultation, offshore operations, scientific laboratory services, conservation and other specific subject-matter experts that are drawn upon as required.

2. Environmental Management Programme

The key objectives of the EMP include the following:
• Establish the environmental baseline of the application area in the context of the broader EEZ
• Assess and manage the potential for any impacts of exploration activities;
• Provide new insights into the ecosystems of the CI EEZ for not only Moana Minerals but also the government and the people of the Cook Islands
• Use the baseline to assess the likelihood of significant impacts of any future contemplated exploration and nodule recovery activities and to adapt plans to mitigate such impacts
• Develop and deliver an ESIA for proposed recovery system

Moana Minerals' Environmental Management Programme (EMP) is based upon the Precautionary Principal as set out in the Marae Moana Act 2017, and in accordance with the Seabed Minerals Act 2019 and the Environment Act 2003. To ensure that our work programme and studies generate the information required by technical experts, regulators and stakeholders, investigations will be performed within an Ecosystem based Management framework. This framework is built off our Environmental and Social Impact Assessment (ESIA) Scoping Study. At the start of our exploration programme, the ESIA Scoping Study recommendations and findings will be workshopped with regulators and stakeholders.

The proposed EWP will involve physical, chemical and biological sampling and analysis of the air, sea surface, midwater ecosystems and seabed and will include activities such as	
• acoustic mapping of the seafloor	• imaging of the seafloor and nodules
• analysis of the chemical composition and metal content of nodules samples	• identify and define surface, seafloor and water column biological communities
• recording of observed ocean wildlife, vessel activity and debris over the application area and extending into the broader CI EEZ	• long term collection of water column data (sound, temperature, salinity, currents, turbidity, dissolved oxygen, sedimentation)
• measurement and analysis of water and sediment composition and properties	

The specifics of environmental sampling activities will be dictated by data needs of the ecosystem models that are the framework of the environmental program. As our understanding of the exploration environment and its surroundings grows these models will be reviewed and updated throughout the program. This process ensures the necessary data and information for impact assessment and evidence-based environmental management decisions is being collected.

The EMP will have a strong focus on data accessibility and transparency through use of an online database. This database will be consistent with data requirements of the International Seabed Authority (ISA).

As required by National Environmental Service (NES) and Seabed Minerals Authority (SBMA), all planned exploration activities including equipment testing, will be assessed for the risk of potential environmental impacts. Should activity risk levels exceed thresholds, these activities will be required to undergo an Environmental Impact Assessment (EIA).

For all exploration activities, risk mitigation plans will be formalised and reported in campaign work plans in addition to annual reporting. Opportunities to participate in or observe exploration operations will be made available for government representatives and interested parties.

3. Benefits to the Cook Islands

Moana Minerals' EWP is designed such that there is the potential to do significant parts of the work using local Cook Islands based vessels and crews, augmented by specialised survey vessels and experts. As evidenced from the 2019 research campaign, our approach to exploration is to maximise use of local assets, rather than mobilising expensive, foreign flagged ships.

Benefits for all stakeholders include:	
• increases local expertise	• keeps exploration funds in the local economy
• creates jobs	• reduces the operational carbon footprint
• training and workforce development	• optimises costs
• provides more local control in terms of scheduling and allocation of resources	

Moana Minerals will ensure that our Cook Islands based community liaison officer visits at least two islands in the pa enua (outer islands) each year and will offer in-service training or scholarships.

Environmental studies will generate opportunities for collaborative research and community outreach and education about the biodiversity and ecology of Cook Islands' deep-sea environment. Examples of collaborative research and community engagement.
• Creation of internships within the company in the areas of geology, environment, database management, administration, operations (including safety) etc
• Creation of research scholarships in the physical or life sciences
• Deployment of tools and training packages to engage the marine research and tourism sectors and inter-island shipping industry in collecting valuable environmental data
• Light engineering and logistic support to exploration cruises

This project has the potential to develop a new industry sector with multiple employment opportunities made up of a new local skill base that will be well placed to support not only Moana Minerals' program, but other exploration programs, and eventually future operations should these proceed.

Moana Minerals believes our work plan as proposed will provide the necessary crucial information to help all seabed minerals stakeholders understand the opportunities and risks associated with proceeding beyond exploration of the nodule resource.

Exploration and Environmental work programs		
Year 1:	*Fitting out exploration vessel(s) with scientific equipment; training crews; establish CI office; complete broad area seabed survey & collect nodule material for pilot process testing; initiate environmental programme and update ecosystem models*	*$11.0M*
Year 2:	*Pilot process testing and develop commercial process flowsheet and cost estimates; analysis of survey data & build maps; design & install environmental moorings; collect nodule grab samples to update resource estimates; complete project PFS; environmental sampling and ecosystem model updates*	*$18.9M*
Year 3:	*Environmental mooring data recovery and servicing; ecosystem model updates; collect nodule grab samples and update resource estimates;*	*$17.5M*
Year 4:	*Continued environmental mooring data recovery and analysis; completion of ESIA;*	*$12.7M*
Year 5:	*Potential testing of mining related technologies and equipment; Submission of applications for Environmental Permitting and Mining Licence.*	*$5.7M*
	Total (NZD millions):	***$66.0M***