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Application for approval of a plan of work for exploration for polymetallic nodules in the Area by Nauru Ocean Resources Incorporated

Executive summary*

1. Nauru Ocean Resources Inc. ("NORI"), having made an application for approval of a plan of work for exploration on 31 March 2008, hereby submits to the International Seabed Authority an updated application that reflects developments since the original application was tendered. A brief summary of the updated application is given below.

2. Highlights:

- NORI is wholly owned by two Nauruan foundations whose purpose is to advance education, training, health and environmental rehabilitation in Nauru (the "State") and who will use the funds from polymetallic nodule mining for these purposes
- NORI has committed to a fully funded work programme with a guaranteed minimum budget that exceeds the funds committed by 60 per cent of the current Authority contractors in their applications for a plan of work for exploration
- NORI has world leading polymetallic nodule technical capacity, including a team of international experts many of whom were leaders of the largest programmes of sea floor polymetallic nodule exploration and engineering conducted to date
- NORI is committed to applying the world's best practices in environmental protection and has strong environmental credentials with international experts on its team
- NORI is investigating using renewable energy for future sea floor mining and has assembled a team of leaders in this field

* Submitted by Nauru Ocean Resources Incorporated.

- NORI is investigating the production of potassium or sodium permanganate from the processing of polymetallic nodules for use as a cheaper substitute to chlorine for water treatment thereby assisting to make clean water more accessible to the world; this is in addition to NORI's Clean Water from Underwater Metals initiative, through which water purification and distribution systems will be built and implemented in third world countries to supply sustainable access to safe drinking water and basic sanitation
- Through this application NORI is not seeking a mining licence, merely a right to explore to advance knowledge of science on which the Authority and the international community may base a future decision on whether sea floor polymetallic nodules should be mined or not

Ownership and corporate governance

3. In 2008 NORI was a subsidiary of Nautilus Minerals Inc. ("Nautilus"). Since that time Nautilus has sold all of its ownership and interest in NORI. NORI is now wholly owned by the Nauru Education and Training Foundation and the Nauru Health and Environment Foundation; two Nauruan foundations which own NORI in equal shares. As such, NORI is no longer affiliated with Nautilus or any other entity or person outside of Nauru. Having been incorporated within the jurisdiction of Nauru, NORI is a registered national of Nauru and is subject to the effective control of the State. NORI must comply with Nauruan laws and the State has ultimate control to deregister the Company should NORI not maintain compliance.

4. NORI is also corporately controlled by Nauruan nationals, with the majority of the Board of Directors being Nauruan. The Board of Directors of NORI comprises:

- Dominic Tabuna, Minister for Commerce, Industry and Environment, Republic of Nauru
- Kieren Keke, Minister for Foreign Affairs, Republic of Nauru
- David Heydon

5. In addition, all of NORI's shareholders are Nauruan. The Nauru Education and Training Foundation and the Nauru Health and Environment Foundation are controlled by Nauru and will distribute within the State the income NORI receives from mineral production in the licence area. The Nauru Education and Training Foundation will distribute its share of the income to promote education and capacity-building in Nauru, while the Nauru Health and Environment Foundation will utilize the income for health services and environmental rehabilitation in Nauru.

Sponsorship

6. Following delivery of the advisory opinion by the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, the Republic of Nauru has, in a letter to the Secretary-General of the Authority, reaffirmed its commitment to fulfilling its responsibilities under the Convention and taking all necessary and appropriate measures to secure effective compliance by NORI with the terms of the Authority exploration contract and the obligations set out in the Convention and related instruments.

7. The State has shown an overriding caution and concern for ensuring that its sponsorship responsibilities and obligations are fulfilled, including requesting that

the exploration application be postponed until an advisory opinion was delivered by the Seabed Disputes Chamber.

8. The State has welcomed the advisory opinion delivered on 1 February 2011, and has commenced the process of implementing a comprehensive legal framework to regulate NORI's activities in the international seabed area. In this regard, collaborative work has commenced with the Applied Geoscience and Technology Division of the Secretariat of the Pacific Community (SPC-SOPAC) on their European Union-funded deep sea minerals project aimed at strengthening the system of governance and capacity of countries in the management of deep sea minerals through the development and implementation of sound and regionally integrated legal frameworks, including legislative and regulatory frameworks for offshore minerals exploration and mining, as well as improved human and technical capacity and effective management and monitoring of offshore exploration and mining operations.

9. Nauru has made a commitment to the Authority to implement this legislation, notwithstanding that some of the existing contractors do not have such legislation in place for deep sea mineral exploration in the Area. Nauru's legislation will create a programme for the licensing of activities in the Area and detail the conditions Nauruan contractors must satisfy prior to the State granting approval to any at-sea mineral exploration or exploitation, including financial and technical capacity requirements. Licences will be issued subject to the terms, conditions and restrictions necessary to ensure the State fulfils its sponsorship responsibilities and to ensure the Nauruan contractor has fulfilled its obligations set out in the Convention. However, given that such a regulatory framework will be specific to deep sea exploration and mining in the Area, it would not be prudent for Nauru to expend significant resources implementing such a framework until NORI has firstly obtained an exploration contract from the Authority. This will not pose any risks as NORI's at-sea exploration in the Area will not commence until after such time as Nauruan legislation is in place. This approach is also in line with the Seabed Disputes Chamber's advisory opinion which determined that legislation is not a prerequisite for obtaining an Authority exploration contract.

10. Regulations will be adopted in Nauru to address specified issues relating to seabed mining and exploration, including protection of the marine environment, conservation of natural resources and preservation of safety of life and property at sea.

11. The State will monitor seabed mining activities to enforce the legislation, the regulations issued pursuant thereto and the terms, conditions and restrictions imposed on any licensee.

12. Enforcement powers for non-compliance by licensees, in addition to civil and criminal penalties, will include suspension and revocation of a licence or a permit, or suspension or modification of particular activities authorized by a licence or permit.

13. These laws and regulations will be as stringent as those adopted by the Authority and as effective as those international rules, regulations and procedures governing the activities in the international seabed area.

14. A leading environmental law firm in New Zealand has also been engaged, along with a leading international consulting firm, to assist in the preparation of appropriate legislation for the Government of Nauru and in the implementation of an administrative structure that would ensure monitoring and enforcement is maintained and enhanced to a world leading regulatory level.

Technical capacity

15. NORI's technical alliance team is the global leader in ultra deep sea mineral exploration and development, comprising international experts and organizations with an unparalleled combination of world class experience, reputation and skills in ultra deep sea mineral exploration, geology, environmental science, engineering, technology development, offshore production and metallurgy.

16. NORI's technical team boasts a world leading track record in deep sea mineral exploration and extraction, including:

- Polymetallic nodule resource definition and geophysical surveys in water depths of 5,000 metres in the Clarion-Clipperton Zone
- Development of remote operated drilling systems for mineral resource drilling in water depths up to 4,000 metres
- Development of remote operated deep sea equipment in excess of 1,000 horsepower
- Development of the Spar oil and gas production platform with engineering dynamics applicable to deep sea mining
- Engineering of a riser pipe and pumping system for polymetallic nodule mining at water depths of 5,000 metres in the Clarion-Clipperton Zone
- Engineering of a collector and mining tool that successfully trial mined 900 tonnes of polymetallic nodules at water depths of 5,000 metres in the Clarion-Clipperton Zone

17. Importantly, NORI has obtained the services of key leaders from all of the four major international consortiums that developed and successfully trial-mined deep sea mining systems to harvest polymetallic nodules in the Clarion-Clipperton Zone in the late 1970s, including from Ocean Management Incorporation, Kennecott Exploration Consortium, Ocean Minerals Company and Ocean Mining Associates.

18. The following experts represent just some of NORI's technical alliance team:

Ted Brockett: the world's most experienced developer of polymetallic nodule mining equipment, whose systems were successfully used to trial mine nodules in the Clarion-Clipperton Zone in the late 1970s

Mike Williamson: world leading geophysicist who was instrumental in conducting Ocean Management Incorporation's polymetallic nodule exploration in the Clarion-Clipperton Zone

Jon Machin: world leading subsea industry geotechnical engineer and ultra deep sea remote vehicle engineer

John Halkyard: world leading offshore engineer and previously technical lead for the Kennecott Exploration Consortium polymetallic nodule project in the Clarion-Clipperton Zone

Craig Smith: world leading deep sea environmental scientist and independent expert adviser to NORI

Charles Morgan: previously Senior Research Scientist for Lockheed Advanced Marine Systems, as part of Ocean Minerals Company's polymetallic nodule project in the Clarion-Clipperton Zone

David Cronin: Professor at Imperial College London and leading world expert on sea floor polymetallic nodules

Fraser Ralley: Director of Derrick Offshore, the world's leading international ship broker

19. NORI's technical alliance also includes the following world leading international organizations: Cellula Robotics Ltd., Derrick Offshore Ltd., LongReach Marine Pte Limited, Sound Ocean Systems Inc. and Williamson & Associates Inc.

Environmental protection

20. NORI is committed to applying the principles of the world's best practices in environmental protection, as well as operating in line with the following internationally accepted environmental, social and governance principles and standards: United Nations Global Compact; Millennium Development Goals; International Finance Corporation Performance Standards on Social and Environmental Sustainability; World Bank Group Environmental, Health and Safety Guidelines; the Precautionary Principle; the Equator Principles; and the International Marine Minerals Society Code for Environmental Management of Marine Mining.

21. As well as building a world class in-house environmental team, NORI will engage international environmental experts and consultants to ensure NORI's environmental programme and exploration activities set leading standards in deep sea environmental practice.

22. To this end, NORI has already engaged international experts to review and contribute to NORI's environmental programme, including Craig Smith and Charles Morgan. Craig Smith, a leading world expert on sea floor ecology and oceanography, is the Professor, Department of Oceanography, University of Hawaii at Manoa. He has led 48 research cruises and is the author of over 100 scientific publications. Charles Morgan, an oceanographer and geologist, has had extensive involvement with the Authority including as Representative of the United States of America on the Legal and Technical Commission (1997-2001), and has provided technical expert advice and input into the drafting of Authority rules, regulations and recommendations, as well as most recently compiling the Geological Model for the Clarion-Clipperton Zone.

23. Prior to carrying out at-sea exploration, NORI will convene a workshop in which a team of international scientific experts will be brought together, led by Craig Smith, to further design the environmental programme to ensure a state-of-the-art programme is carried out by NORI in cooperation with the international scientific community. The team of scientists selected to participate will include world leading experts in deep sea biology, molecular genetics, chemical oceanography, physical oceanography and marine conservation, among other fields. NORI will also invite the Authority to propose independent candidates to attend this workshop.

Advancing science

24. NORI will facilitate communication of scientific information to the international community regarding environmentally related technical developments and scientific knowledge as needed to improve the international scientific community's understanding of the deep sea environment. Specifically, NORI is committed to:

- Providing transparency in its environmental activities by regular reporting of environmental planning, monitoring, assessment and other actions relating to protecting and preserving the marine environment
- Liaising with stakeholders and facilitating partnerships with the global scientific community on environmental matters
- Reporting publicly on environmental performance to all stakeholders, including the Authority, scientific researchers, non-governmental organizations and the general public

25. NORI will also facilitate free exchange and easy availability of environmental information and geological and biological sample collections gathered during NORI's plan of work for international scientific peer review and understanding and national and global heritage use. Specifically, NORI will:

- Standardize environmental data according to the latest and highest standards for the relevant discipline in order to facilitate analysis and comparisons and make this data available to all stakeholders and for exchange, review and analysis in forums such as workshops
- Deposit non-proprietary environmental data securely in freely and easily accessible appropriate national and international archives for review, further scientific analysis and reporting
- Deposit for review, further reporting and scientific research representative collections of geological and biological specimens in appropriate repositories with requisite long-term storage facilities, which may include national museums, government institutions, relevant specialized global repositories and universities

26. NORI has already initiated collaboration with scientific institutions and will continue to promote international cooperation in marine scientific research.

27. NORI is committed to carrying out comprehensive training programmes for developing State nationals nominated by the Authority. NORI's training programmes will focus on enhancing the skills and experience of scientists from developing States including engineers, marine biologists, oceanographers, geophysicists and geologists. NORI will provide three separate training programmes including the At-Sea Exploration Training Programme; Fellowship Programme; and Engineering Training Programme. Over the first five-year plan of work these programmes will provide at least eight trainees with a valuable opportunity to either participate in NORI's at-sea exploration to gain experience in the field, undertake courses with leading scientific experts at world class institutions around the world, or participate in NORI's deep sea engineering programme.

Republic of Nauru

28. This project will make a significant difference for Nauruan people and represents a valuable opportunity for the State to advance its social and economic development to ensure Nauru's long-term sustainability. Secondary phosphate mining in Nauru will only last for a few more years; therefore, this project will provide a significant potential income source that will assist in that transition phase.

29. Nauru relies on foreign aid and support as well as imported food, resulting in significant health issues in the State. Importantly, Nauru's own land resources have been significantly depleted due to overharvesting of its phosphate deposit by other countries and there is little arable land remaining. Because phosphate mining has left 80 per cent of Nauru uninhabitable, it is essential that Nauru rehabilitates its environment to make it suitable for habitation and agriculture; the cost of rehabilitation is reported to be in excess of $200 million. This project therefore allows the State to benefit from resource development without Nauru being further depleted of what little natural resources are left, and will provide the State with an important income source to fund environmental rehabilitation. With the income derived from the project the Nauru Health and Environment Foundation will play a crucial role in addressing these health and environmental issues in Nauru. Essentially, this project represents an opportunity for the mining industry to give back to Nauru. The State is also interested in participating in activities in the Area as Nauru does not have any commercially prospective non-living sea floor minerals in its exclusive economic zone.

30. Nauru will particularly benefit from training and capacity-building from this new industry in Nauru given that this area has been identified as a national incapacity in Nauru's National Sustainable Development Strategy 2005-2025. The training provided by Nauru Ocean Resources in partnership with the Nauru Education and Training Foundation will particularly benefit Nauru's young people, who will over time be employed in the project or serve as advisers to the State.

Exploration for the benefit of mankind

31. Importantly, NORI is not applying for a mining licence, but simply the right to explore, to gather data and carry out scientific and technological studies; which will advance mankind's scientific understanding and global technological development.

32. NORI is offering to expend substantial resources (at NORI's financial risk) to conduct the necessary studies to develop the project to a point where the Authority can make a decision concerning whether or not to grant a mining permit.

33. In 1981 the National Oceanic and Atmospheric Administration concluded in its Deep Sea Mining Final Pragmatic Environmental Impact Statement that it was essential to move to the next phase of exploration and carry out polymetallic nodule trial mining in the Clarion-Clipperton Zone to monitor and examine the nature and significance of impacts on the environment. Unfortunately, over 30 years have passed since that recommendation with no extensive trial mining and thus no significant increase in the knowledge of the environmental impacts beyond what was gathered during the trials in the late 1970s. Without this important data it is not possible to make an accurate comparison of the environmental impact from deep sea polymetallic nodule mining versus traditional land-based mining. NORI is offering,

after conducting an environmental impact assessment, to expend significant funds to carry out trial mining and therefore move the world's scientific knowledge forward.

34. NORI will also devote significant resources to pursuing environmentally responsible operations through innovations in technology and equipment, improvements in energy use efficiencies as well as in prevention, minimization and recycling of emissions and wastes.

35. NORI's innovations and technology development will in turn provide important benefits to mankind. For example, an Ocean Thermal Energy Conversion ("OTEC") system will be studied and investigated for its potential to generate electricity during mining. OTEC utilizes the temperature differential from the water pumped up from the sea floor with the nodule ore and the surface water temperature. To further minimize the offshore operations' carbon footprint, other renewable energy sources such as wind turbines and wave energy will be considered for incorporation into a mining platform. NORI's technical alliance includes world leading experts in OTEC and Offshore Wind Energy, including John Halkyard, Jon Machin and Eric Jackson, who have all been involved with the Lockheed Martin OTEC Project. NORI technical alliance member Charles Morgan was also involved in carrying out the environmental assessment and permitting plan for the Lockheed Martin OTEC Project.

36. By designing and developing these innovative clean energy solutions, NORI will be contributing significantly to reducing the carbon footprint of the whole polymetallic nodule mining industry and will be developing technologies that other Authority contractors can also use. Moreover, the research and development undertaken by NORI during exploration will provide benefits to the world even if polymetallic nodule harvesting does not prove economically viable, because these renewable energy technologies will have applications far beyond polymetallic nodule mining. For example, OTEC represents a valuable opportunity for Pacific Island States to generate much needed electricity and an opportunity for this renewable energy source to replace the current carbon polluting diesel and oil fired power generators of many Pacific Island States. Indeed, the Republic of Nauru previously set a world record for power output from an OTEC system where the power was sent to a real power grid. NORI will leverage Nauru's previous OTEC experience and NORI's own world leading OTEC expertise to optimize the engineering and design.

Environmentally and socially advantageous mineral supply

37. As alluded to in article 150 of the Convention, the supply of more accessible and affordable raw materials is critical to promoting economic development, particularly in developing States. Indeed, the products of polymetallic nodules — manganese, nickel and copper — are basic ingredients essential for economic and social growth. Highlighting the importance to the future of mankind of polymetallic nodules (28 per cent manganese and 1 per cent copper), it can be noted that manganese is the fourth most used metal in the world and copper is the third (iron and aluminium are first and second). As the world population continues to grow and developing States pursue a transition to industrialized economies, the demand for these metals will continue to rise. However, if demand increases without a commensurate increase in supply the price of these metals will become unaffordable to the majority of people in the world. Indeed, supply on land is not keeping pace

with demand and the grade (percentage) of metal in the ore mined on land is dropping as the superior higher grade material has previously been mined. Mining lower grade material is both socially and environmentally damaging as it requires moving more rock per tonne of metal recovered with attendant greater surface area disturbance, higher fuel emissions per tonne and larger waste rock dumps. Sea floor mining offers a new supply which will be critical in meeting this demand and NORI is committed to assisting the Authority to achieve its mandate of ensuring the development of the resources of the Area (article 150 (a)) in an environmentally sustainable manner. Moreover, NORI is confident that sea floor mining will offer an environmentally and socially advantageous alternative to land-based mining; therefore providing a net benefit to the global environment and society. In contrast to terrestrial mining, sea floor mining involves minimal overburden and stripping, decreased extraction waste, minimal production infrastructure and no deforestation. Indeed, every year that nickel is not produced from the sea floor means another year that virgin rainforests are stripped to obtain the metal from nickel laterites which occur predominantly in the equatorial regions. In contrast to sea floor polymetallic nodules that occur on the abyssal plains which are the most common environment on the planet, nickel laterites occur in unique tropical rainforests which are rapidly being depleted across the globe.

38. To assist in the discussion of whether to allow mining of sea floor polymetallic nodules, NORI is conducting a study comparing the environmental and social effects of mining polymetallic nodules and the current alternative of degradation and stripping of rainforests under land-based mining of nickel laterites. This study recognizes that developing States are demanding increasing quantities of metal and the supply of metal needs to grow which poses the question of where should future supplies come from. It seeks to determine which alternative — sea floor or land — offers the best environmental and social solution. That is, which is better for the "good of mankind"?

39. In line with the Authority's mandate to ensure proceeds from sea floor mining in the Area are distributed to developing States, NORI too is committed to ensuring that the metals produced from its operations reach the communities most in need of raw materials. Specifically, NORI will focus on building and implementing water purification and distribution systems in third world countries. Through NORI's Clean Water from Underwater Metals initiative, NORI will be supplying sustainable access to safe drinking water and basic sanitation to communities in developing States. NORI will work with the Authority, other international organizations, local governments and communities to identify areas of greatest need. NORI will partner with organizations and experts on the ground to implement these solutions. NORI is also working with world chemical experts to develop innovative solutions for the water treatment industry by harnessing the value of the manganese ore recovered in NORI's sea floor harvesting operations. By supplying potassium or sodium permanganate (a substitute for chlorine in water treatment) at more affordable prices NORI will assist to make clean water more accessible to the world. Indeed, the United Nations Children's Fund reports that approximately 4,500 children die each day from lack of clean water and NORI is committed to doing what it can to address this issue.

40. NORI will also collaborate with scientific institutions currently studying the Great Pacific Garbage Patch (a massive gyre of pollution in international waters located in the central North Pacific Ocean) to identify ways to best address this

environmental problem and clean up the pollution. During commercial production when NORI has an operating platform at sea, NORI will assist in the clean-up operations of the Great Pacific Garbage Patch.

41. NORI looks forward to playing an important role in addressing world poverty and promoting higher standards of living, employment and conditions of economic and social progress, as well as ensuring sustainable supply of natural resources for future generations. This, as detailed in Article 55 of the Charter of the United Nations, will assist to create conditions of stability and well-being which are necessary for peaceful and friendly relations among nations.