ISA Stakeholder Questionnaire 2014

To whom it may concern,

Please see comments below from the United Kingdom's **National Oceanography Centre** (www.noc.ac.uk) based on input from our scientists and staff. NOC is the UK's primary centre of expertise for deep ocean science, providing unbiased scientific advice to HM Government and overseas administrations. NOC is wholly owned by the Natural Environment Research council www.nerc.ac.uk .

We hereby grant consent for contact details and our submission to made publicly available, and can confirm that we are interested in being contacted in future by the ISA and/or being part of a stakeholder group.

This submission has been prepared by Stephen Hall and Dr Jennifer Riley of the NOC International and Strategic Partnerships Office, with additional material from Alan Evans and Dr Bramley Murton of the NOC Marine Geoscience Group. For contact details please use:

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We have only attempted to answer those questions where the National Oceanography Centre's staff are competent to comment, & start at question 16, completing as far as question 27.

16. Please describe any general recommendations that the ISA should consider in developing rules, regulations and procedures on the prevention of damage to the marine environment from activities in the Area;

16.1 Before any development is approved the ISA must be adequately well-informed about the likely impact of human activities on the proposed area.

16.2 An ecosystem-based environmental impact assessment (hereafter 'EIA') of sufficiently high resolution to produce informative conclusions should be carried out pre-development of the chosen site.

16.3 The results of the EIA must be placed in the public domain for a period long enough to allow time for any appeals against development by competent bodies.

16.4 A threshold for 'reasonable damage to the ecosystem and/or seafloor environment' should be defined for the proposed development, perhaps based on some form of cost/benefit analysis. Some damage to the local environment is inevitable, so limits should be set as to the amount of disruption that is considered acceptable. For example there could be limits, set on a sliding scale and based on the amount of time that will be required for natural processes or biological remediation to 'repair' any damage done. A sensitive location with intensive biological activity (such as an active hydrothermal vent community) would require a very high burden of evidence to justify development, whereas a deep-ocean location in a relatively barren environment with limited biological activity could be deemed capable of supporting a large development with minimal long-term impacts.

16.5 It is important to add the caveat that there remain many gaps in our collective knowledge of the deep ocean, and there could be damage caused through human ignorance that might prove very hard to remediate after the event.

16.6 There are no 'one size fits all' solutions – each development needs to be assessed on its own merit.

16.7 Decision makers should take into account the principle of fairness to contractors who wish to carry out operations in the Area versus competitors working in a terrestrial situation. In many jurisdictions land-based developers are not expected to fully restore very large-scale open-cast mining operations, therefore it may not be reasonable to subject offshore developers to

requirements that are more onerous than those placed upon terrestrial operations. There may be some ocean locations where large-scale operations do not have sufficient negative environmental impact to justify having to pay for extensive remediation activities, versus others where even small amounts of activity could have severe negative impacts.

16.8 The developer should be responsible for covering the costs of the EIA, but should not be expected to fund additional survey work requested by objectors to the proposed operations.

16.9 An area adjacent to the zone identified for exploitation (Preservation Reference Zone) should be set aside as a 'control' zone so that comparisons can be made of impacts before and after exploitation has commenced.

16.10 While the developer should fund the costs of the EIA, the work should be specified and contracted-out through the ISA to surveyors independent of the developer.

17. The Exploration Regulations do not reflect any restorative or rehabilitative obligations in the marine environment. In your view, under an exploitation framework, what general restorative or rehabilitative obligations should be incorporated?

17.1 There isn't a single answer suitable for all situations – each development needs to be assessed on it's own merits. Where a development is permitted to take place in a location where there will be negative environmental and ecological impacts it should be mandatory that the developer is responsible for setting aside resources to a fund that will cover the costs of restoration after the resource has been exploited. The fund should be in a 'safe' location so that a company that goes out of business does not leave third parties such as tax payers having to cover remediation costs.

17.2 A definition of restoration is required. A terrestrial development might require remediation in terms of aesthetic appearance, amenity value, contamination containments and ecological recovery. The imperative to remediate the aesthetic appearance and amenity value of a deep-seafloor development would either not exist or at least be minor by comparison. However, the requirement to ensure contamination containment allowing for

eventual ecological recovery should be high.

18. As part of the approval process for exploitation, Environmental Assessments and Environmental Management Plans will be required.5 What procedural steps should be incorporated into the regulatory framework to evaluate Environmental Assessments and Environmental Management Plans? What independent verification procedures should be adopted by the LTC in reviewing Environmental Assessments and Environmental Management Plans?

18.1 An international peer review panel of recognized experts who are independent of direct or indirect funding from developers (*with the caveat that in many instances these are areas new to science*) should be established to evaluate Environmental Assessments and Environmental Management Plans on a case-by-case basis.

18.2 This would be an interim measure pending growth in the skill base in assessing impacts of human activities in the Area. Once such activities are routine, a permanent Secretariat of trained individuals should be established to assess each bid. Perhaps a permanent Secretariat could be established at an earlier phase to work closely alongside present-day experts to build expertise more quickly.

18.3 As part of the licensing process, funds should be drawn from developers and set aside by the ISA for contracting specialists to independently evaluate raw data from active and post-activity monitoring.

19. As to any damage to the marine environment following the removal of a substrate (e.g. polymetallic nodules) what do you consider the most appropriate advance response strategies to conservation, restoration and natural remediation of biological diversity and ecosystem functioning? Is remediation best achieved by the development of Areas of Particular Environmental Interest6 and Preservation Reference Zones7 envisaged by the Exploration Regulations?

19.1 For resources such as polymetallic nodules the cost per square kilometer of seabed remediation could be so high as to render the extraction of the resources uneconomical. Hence a case-by-case approach should be taken as

to whether or not remediation is required. A better approach could be to design mining operations so as to leave ‘fallow’ strips between extraction pathways, spaced sufficiently closely so as to allow recolonization of the exploited strip. Setting aside Areas of Particular Environmental Interest should be a standard measure if there are features or life-forms at risk, and Preservation Reference Zones should be part of the design of any areas to exploited.

19.2 For SMS extraction, the degree of remediation should be similar to the natural processes that disturb SMS deposits. Since these deposits are located in active geological environments, where burial by lava flows, land slides and exposure of SMS by tectonic faulting is a common process, the amount of remediation required is probably minimal. Good practice should, however, demand that refuges or fallow areas be left to allow recolonization, replicating natural processes disturbance to SMS deposits is likely to be sporadic in time and space.

20. In connection with question 19 above, what ecosystem functions are critical to restore and / or what levels of biological diversity should be conserved at regional levels, local scales and over what time periods?

20.1 As in previous questions there are no ‘one size fits all’ answers, each case must be assessed on it’s own merit. Sites where biological systems carry out critical ecosystem functions should all be either avoided as industrial activity areas or vigorously restored to full health after human activity is complete. Critical ecosystem functions include areas where breeding, spawning and nest-building takes place, areas where human activity might impinge on air/sea gas exchange, drawdown of carbon, biological processing of nutrients and pollutants, highly productive plankton zones for oxygenation of sea water, places where animal migration might be impacted by noise or physical barriers, etc

20.2 In some instances avoidance of human activity at certain times of year, e.g. breeding or migration seasons, may be all that is required to mitigate impact. This does however require quite detailed pre-activity scientific assessment of biological activity, perhaps over several years. It is not easy, and may be impossible, to provide alternative routes for fish or cetacean

migration. If activity in and Area is granted periodic monitoring should be in place to ensure that mitigation strategies are working appropriately.

20.3 Consideration should be given to the degree of endemism. For example, where this is high (such as at active hydrothermal vents) industrial activity should be prohibited. Where it is low (e.g. relatively 'barren' abyssal plains), the impacts of industrial exploitation are likely to be less. Designation of high or low endemism requires biological population studies of the local fauna and comparison with the regional and global population.

21. The Exploration Regulations (and the Convention) envisage an emergency response (known as "emergency orders") where an incident has caused, is causing or poses a threat of serious harm to the marine environment. Please describe any recommendations you have in the light of best practices on the measures and procedures that should be adopted in connection with an emergency response.

21.1 The critical lesson from the Gulf of Mexico oil spill was that it is important that mitigation procedures and equipment are readily available for immediate deployment, and that responders have practiced the procedure before it happens in real life.

21.2 In order to be well prepared to deal with an emergency response action plans should be put in place which all parties involved with the activity are aware of and agree to. If a situation were to arise whereby assistance was needed from nearby countries that were not otherwise involved in the activity, some provision for the financial resources that are spent should be in place.

22. A number of international and domestic legal instruments, including the Exploration Regulations, incorporate terms such as "serious harm" or "vulnerable marine ecosystems" in connection with the protection of the marine environment. How do you think these terms should be better defined and interpreted in the exploitation regulatory framework?

22.1 'Serious harm' can mean damage that temporarily completely stops or significantly degrades an ecosystem service or causes a temporary (which could be a period of many years) loss of the majority of biological activity, or

alternatively/additionally leads to the emergence of a different ecosystem. Given time, and the removal of the disturbance, ecosystems that have suffered 'serious harm' should be able of recover to pre-disturbance (or better) levels of activity.

22.2 "Vulnerable marine ecosystems" are those where the onset of human activities or introduction of other new pressures such as invasive species are likely to lead to a rapid onset of change in the health of the present ecosystem, leading to a range of consequences up to and including ecosystem failure.

22.3 **The question of time scales is critical in defining both terms**. A few years may be a significant time scale from a human perspective for the recovery of disturbance in a terrestrial environment, but an equivalent time scale may be thousands of years in a deep-marine environment. Hence quantifying what is a significant time scale for "serious harm" or "vulnerable marine ecosystems" is critical. The amount of time over which it is acceptable for an ecosystem to recover should therefore be assessed based on the biological and ecological activity of the Area on a case-by-case basis.

23. How can the ISA most usefully promote and encourage the use of best practice (including technology advances and scientific research) to better protect the environment during exploitation operations?

23.1 The ISA's licensing process and details of proposed exploitation operations need to be fully open and transparent with plentiful opportunity for stakeholders to comment and input feedback to decision makers.

23.2 A portion of the license fee should be allocated to scientific research in the area of environmental protection, mitigation and remediation.

23.3 Fee structures can be graded to offer the lowest fees to contractors who operate using best practice and promote the development of improved technology and scientific research.

23.4 The ISA can work with international Learned Societies, insurance providers and Professional Bodies to co-develop codes of practice for use by the marine professionals involved in the exploitation activity.

For example, members of the Institute of Marine Engineering, Science and Technology (www.imarest.org) must sign up to a Professional Code of Conduct when seeking accreditation as Chartered Marine Scientists,

Technologists or Engineers and can have their professional status withdrawn if they are found to be operating in breach of those standards. Since the use of accredited personnel is often mandated by insurance companies as a condition of underwriting projects the insurance sector has an important role to play in ensuring adherence to high standards. The IMarEST codes of conduct could be easily modified to include criteria relevant to safe, sustainable exploitation of seabed resources and this could be actioned very quickly. IMarEST and similar international bodies such as the Society for Underwater Technology (www.sut.org) would be very interested in working with ISA to co-develop Professional Standards suitable for the seabed mining sector, and could offer suitable continued professional development training programmes to roll high standards out across the industry.

23.4 The ISA could interact more closely with research bodies such as InterRidge (http://www.interridge.org), as well as industrial best-practice groups (such as the Underwater Mining Institute http://www.underwatermining.org/ and the relevant special interest groups of IMarEST and SUT) to help develop better, less disturbing and more cost effective practices through greater understanding of the geological processes operating at seafloor deposits and the technology to explore, assess and exploit them.

24. Are there any other fees or levies that the ISA should consider to promote environmental compliance?

24.1 As per 23.2 and 23.3 above, fees or levies can be structured in such as way as to provide optimum value for operators who use the highest standards.

24.2 A levee should be raised to enable the ISA to contract independent EIA surveys both pre, during and after the developers activity has ceased.

25. For the monitoring of activities in the Area, the Exploration Regulations provide for an inspection regime. Additionally, Sponsoring States may also undertake monitoring of Sponsored Contractor activities in the Area through inspection.

a. In your view what monitoring obligations should be placed on Contractors operating in the Area and included in the exploitation regulatory framework?

25.1 Video monitoring of the seabed operation viewable in near real time by the public via the internet, with tamper-evident seals on the camera systems.

25.2 Regular access for inspection by representatives of bona fide NGOs, academic researchers.

25.3 Repeat surveys using In situ sensors and observatories for monitoring and AUVs or other platforms to monitor (i) plumes for chemical, particulate, pollutants, noise, oxygen disturbance, and sediment fall-out; (ii) progress of extraction and the impact on the biota; (iii) independent scientific studies of the geology of the deposits to enable better understanding of their structure and composition to better inform the ISA and industry to enable more effective exploration and extraction with less environmental disturbance. Data to be publically available at all times and subject to commercial confidentiality.

25.4 Where companies are using the territorial waters or coastal ports of a UN Member State to land mined products, there may be an environmental impact in the coastal areas from associated shore-based processing. The Member State must be able to ensure that all local rules and environmental regulations are observed, regardless of the location of origin of the raw material being processed.

b. Please list the key measures and characteristics of what should be considered in establishing a supervision programme to verify compliance of Contractors with the rules, regulations and procedures, particularly compliance with their monitoring obligations above. In your view, how should such an ISA regime be structured and implemented, including the frequency of inspection, by whom and how should an inspection regime be funded?

25.5 Continual seafloor monitoring by Autonomous Underwater Vehicle (AUV) or fixed observatory with real time data feed to public domain via ISA.

25.6 Repeat seafloor surveys (by AUV/ROV) on a yearly basis with real time data access publically.

25.7 Continual seafloor monitoring maintained by the developer. Annual surveys commissioned by the ISA to independent specialists.

25.8 Funded from a levy on the developer, EIAs commissioned and owned by

the ISA, all data is available publically.

26. What specific procedural obligations should be adopted under the precautionary approach best environmental practices and adaptive management? Are there any best practice risk management approaches (for example in an oil and gas or fisheries context) that could usefully be adapted to deep seabed mineral exploitation activities?

26.1 Key lessons learnt from stakeholders in the oil and gas industry include the need to place more emphasis on the process safety risks alongside the personal and occupational health and safety. A prime example of this is in the Deepwater Horizon incident in the Gulf of Mexico, where senior management were visiting the platform hours before the disaster but appeared to be more focused on a review of occupational rather than process safety. Occupational safety should not be allowed to remove focus from platform and process integrity especially where the environment may be compromised as a result of an incident.

26.2 Ensuring that information is shared is another key lesson learnt from the oil and gas industry. In the event of a major hazard occurring information from previous lessons learnt should not be the property of any one organization. The sharing of such information in the context of ensuring good/best operational/environmental practice helps to encourage continual improvement across the industry. Lessons should be shared in a prompt and timely fashion so that all in the industry can benefit. Although this information sharing should be industry led, independent regulators should routinely scrutinize the effectiveness with which companies monitor, investigate and learn from their activities and share their experiences.

26.3 Since the Deepwater Horizon, guidance on environmental impact assessments have been strengthened to ensure that all aspects are covered, by inviting independent peer review for all high-risk category wells.

26.4 In order to ensure that the activities in an area are continually focusing on protecting the marine environment the EIA and Environmental statement for an Area should be considered live documents and updates as the project is undertaken. This should help to minimize low-frequency high-risk incidents

NOTE information from the above points at 26.1-4 are taken from

(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48252/3875-offshore-oil-gas-uk-ind-rev.pdf)

27. In considering environmental procedures above, what internationally-accepted environmental management standards should be reflected in the exploitation regulatory framework?

27.1 The ISO14000 family of standards should be the baseline standard applied, preferably upgraded to the higher standard of the European Union's EMAS Eco-Management and Audit scheme, suitably modified for marine industrial applications. (See ec.europa.eu/environment/emas/index_en.htm)

This input submitted by Stephen Hall sph@noc.ac.uk on behalf of the National Oceanography Centre, 15th May 2014