



International Seabed Authority
14-20 Port Royal Street
Kingston, Jamaica

February 20, 2017

RE: A Deep Ocean Stewardship Initiative (DOSI) Workshop to review the **Discussion Paper on the development and drafting of Regulations on Exploitation for Mineral Resources in the Area (Environmental Matters)**

Dear Mr. Lodge,

A group of Deep Ocean Stewardship Initiative (DOSI) scientists recently convened at Scripps Institution of Oceanography in San Diego (1-3 Feb 2017) to review recent work on the deep seabed environment and its management in relation to the ISA Discussion Paper; see Annex 1 for the meeting agenda. Here, for your consideration, we present some of our findings that you may find useful in continuing deliberations at the International Seabed Authority.

At the outset, we acknowledge the excellent work presented in the Discussion Paper:

- ▶ The draft provides a comprehensive and thoughtful outline for taking a contract application through its various stages to approval.
- ▶ The commentary boxes are helpful in presenting options, raising issues to address, and acknowledging sections that require further input.
- ▶ The enhanced role envisaged for the ISA Secretariat (or a Mining Directorate) will be important to ensure effective feedback between applicants and the Authority in a meaningful time frame.
- ▶ The Discussion Paper recognizes that balance is required between strict regulations and flexibility in their application, including the need to build procedures for adaptive management.¹
- ▶ The Discussion Paper opens a pathway for scientists to participate and provide advice for knowledge-based decisions.
- ▶ The Discussion Paper calls for a good level of review of exploitation applications, both internally within the Authority and with external experts. Provisions for consultation with Interested Persons are important to ensure information provided in an application is appropriate.
- ▶ The recommendation for ecosystem-based environmental management underscores the need for integrated and holistic approaches.
- ▶ The Discussion Paper recognizes the importance of protecting Vulnerable Marine Ecosystems and habitats², consistent with the exploration regulations and drawing on

¹ e.g., intro para 7.20, draft reg 41(q), 49(2g), and commentary box p 62.

² draft regulation 41(f); 45(b); & 54

international approaches to managing deep-sea fisheries adopted by the UN General Assembly and regional fisheries management organizations.

- ▶ The combination of a scoping exercise and an EIS as components of the EIA can be powerful and efficient.
- ▶ Transparency and public participation are themes that run throughout the working draft document.³
- ▶ The call for open data sharing is clear.

Our group produced a workflow chart for exploitation applications, based on our reading of the Discussion Paper. Is it an accurate representation of the envisioned process? It may help as a ‘thought piece’ in discussions with other stakeholders. Please modify the chart for your purposes if you find it useful.

In discussing 1) serious harm, 2) the environmental planning process, and 3) input from science in knowledge-based decisions, we encountered a critical gap. It is difficult to operationalize concepts such as serious harm or significant adverse change without first defining strategic environmental goals and objectives. We discussed a set of six potential goals and related objectives that encompassed the Common Heritage, sustainable development, precautionary measures, ecosystem integrity, data sharing, and more. We would be happy to work with the ISA in further development of these goals in the context of its environmental strategy.

Our extensive discussion on the concept of serious harm included past work and current challenges to operationalize the term. A summary of plenary and breakout group discussions is presented in Annex 2.

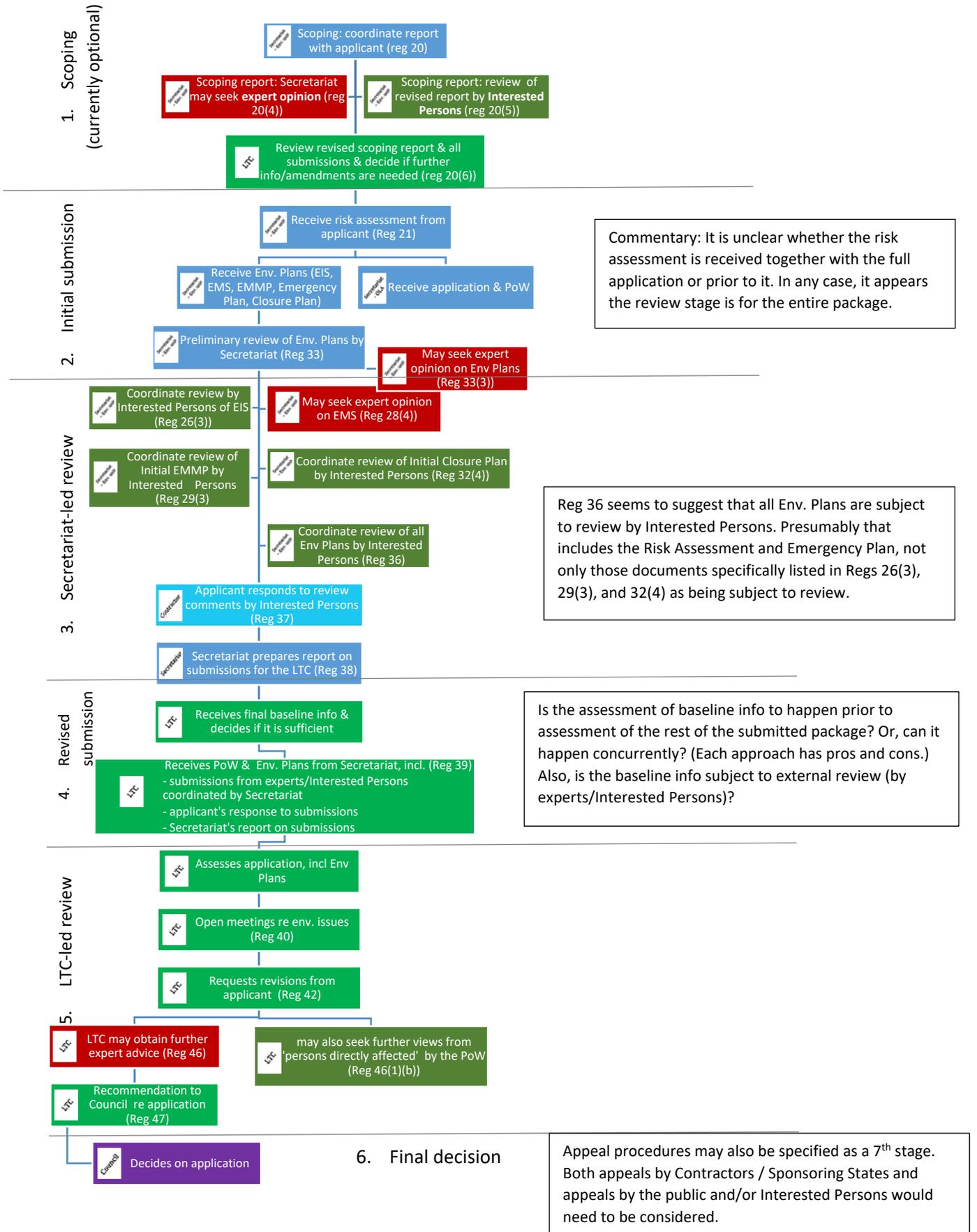
We identified a set of challenges raised by the ISA Discussion Paper that the Authority may wish to consider:

- ▶ Strategic environmental plans and regional environmental assessments are needed before applications for exploitation contracts are assessed in order to generate specific environmental objectives with clear measurable targets linked to management actions.
- ▶ Greater clarity is required on how to operationalise common heritage of humankind obligations in terms of Contractors’ environmental duties, considerations of environmental risks, and the long-term stewardship of mineral and other seabed natural resources for future generations.
- ▶ The ISA Discussion Paper should state where responsibility for regional, ecosystem-based management and strategic planning lies.
- ▶ The resourcing and transparency of internal and external reviews during the EIA process needs to be detailed.
- ▶ We agree that key concepts, such as adaptive management and vulnerable marine ecosystem, and other definitions in the Glossary will need further development.

³ intro paras 4.1c, 4.1i, 5.1, 11.6, 12.3; draft regs 10(1), 33(3), 34(2b & c), 36(1), 38(3), 40, 49(3), and commentary boxes on pp 51 & 74.

Workflow interpreted from Discussion Paper

(colours indicate body responsible and points of possible additional consultation)



Deep-Ocean Stewardship Initiative

- ▶ Rules for the interoperability of data standards among regions, deposit types, contractors, and over time are required.
- ▶ Rules for data and sample submission, archiving and open access are required to, inter alia, build stakeholder trust and knowledge.
- ▶ ‘Remoteness’ of the deep-sea environment is not necessarily a barrier to inspection as currently presented in the ISA Discussion Paper. We note the rapid development in autonomous monitoring technologies, and can provide further information.
- ▶ Formulating clear guidelines and procedures for Contractors is critical, as well as flexibility for these to be updated, and for contractors to adopt Best Available Technologies and Best Environmental Practices as they develop.
- ▶ Recognising both ‘known unknowns’ and the ‘unknown unknowns’ in a precautionary approach will help the Authority meet its obligations.

Our DOSI group has the following short-term objectives that may relevant to your own plans:

- i) Prepare a Response Statement to this Discussion Paper that will be delivered at the Berlin meeting by Dr. Eva Ramirez-Llodra;
- ii) Contribute science-based recommendations for definitions of terms that are critical to implementing many of the draft regulations;
- iii) Develop a position paper on the ecological and cultural value of active hydrothermal vents;
- iv) Develop a strategy to support the DOSI Minerals Working Group review of ISA Draft Regulations.

To that end, we would appreciate notice of the Authority’s plans to request public input.

Please do not hesitate to contact us if you require clarification of our summary recommendations. We wish the Authority success in the development of forward-looking and knowledge-based Environmental Regulations for the exploitation of deep-sea mineral resources in the Area.

Yours sincerely,



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P = in person; R = remotely

Annex 1

AGENDA

February 1

- 9:00 Introductions and Review of Workshop Objectives
- 9:15 An Overview of the issued Discussion Paper: ISA Draft Env'l Regs
- 10:00 First round reactions to document
- 10:45 Group 1: Griffith ISA Workshop Review
- 11:45 Discussion around issues arising
- 12:45 Lunch
- 13:45 Group 2: Discussion of Mining Impact Research Programs, and relevant material
- 14:45 Group 3: Review of stakeholder comments on Draft Exploitation Regulations
- 16:00 Group 4: Review of key scientific concepts in literature relevant to environmental regulation
- 17:00 Discussion of plans for next two days

February 2

- 9:00 Review of objectives of output from workshop
- 9:15 Vulnerable Marine Ecosystems
- 10:30 Group review of Use of Terms and Scope in Draft to identify priority terms for further discussion
- 11:15 Breakout Groups:
 - A. Aims of the EREGS Draft
 - B. The Environmental Baseline
 - C. Environmental Goals/Objectives
- 12:30 Lunch
- 13:30 Breakout Groups (continued)
- 15:30 Plenary Discussion
- 16:00 APEI Lessons learned relevant to environmental regulation
- 17:30 End of day

February 3

- 9:00 Review of Agenda and Breakout tasks
- 9:30 Breakout Groups:
 - A. Part III – Environmental Impact Assessment
 - B. Guiding Principles
- 11:30 Plenary Discussion
- 12:30 Lunch
- 13:30 Serious Harm Discussion
- 15:45 Plenary Discussion and next steps
- 16:30 Workshop product planning
- 17:00 End of day

Annex 2

Serious Harm Discussion

We agree that 'a common definition of serious harm continues to elude us', notwithstanding the one supplied in the tentative working draft regulations (discussed below).

In the absence of an agreed definition, there was nevertheless widespread agreement that, seabed mining *causes serious harm* to the local ecosystems, at the very least in the directly impacted mined area. Given that UNCLOS seeks to "...to prevent serious harm to the marine environment arising out of activities in the Area" (Arts. 162(2)(w) & 165(2)(k)), there was confusion as to how this could actually be applied to DSM. Some participants felt that because serious harm is inevitable, it would be necessary to delineate within the regulations what is an acceptable magnitude and extent. This sentiment was evident in a NZ response to the Zero Draft Regulations which suggested that *Only serious harm permitted by the authority is allowed to take place*. However, other participants felt that it was outside of the scope of the workshop to make recommendations concerning what would be acceptable/missible harm, and that our contribution should be scientific, clarifying the nature of likely serious harms at varying scales.

While not a consensus, many agreed that serious harm could only be operationalized in the context of the environmental regulations if it is considered within a hierarchy of spatial and temporal scales of impact. In particular, it will be necessary to look at mining activities in the context of cumulative harm to regional ecosystems, which will need to be spatially delineated by a scientifically defensible biogeographic classification system. For example, in the selection of the APEIs, the CCZ was thought to have three broad biogeographic zones (Wedding et al. 2013). The potential for serious harm for each claim area should be assessed as a threat to the overall integrity of the ecosystem within its biogeographic zone. Another example is a case in which SMS mining removes a critical source population (e.g. of mussels) that is essential to maintenance of the surrounding metapopulation at other vent sites within (and sometimes outside of) the biogeographic zone.

Time scales by which to consider ecological harm and possible recovery must also be selected, with consideration to both ecological and regulatory relevance. Contracts are for 20 y (though they can be renewed, and some contractors feel they should be for up to 30 or 40 y). Most impacts, however, will extend much longer. Some suggestions were that serious harm should be identified over the next 100 years [consider permanent if extends beyond 100y] or should be determined as a function of [x] generations of affected organisms.

We examined the environmental draft regulation definition of serious harm (p. 10).

"Serious harm to the marine environment" means any effect from activities in the Area on the living or non-living components of the marine environment and associated ecosystems beyond that which is negligible or which has been assessed and judged to be acceptable by the Authority pursuant to these regulations and the relevant rules and regulations adopted by the Authority and which represent:

- (a) significant adverse changes in the living and non-living components of the marine and atmospheric environment;

- (b) significant adverse changes in the ecosystem diversity, productivity and stability of the biological communities within the environment; or
- (c) loss of scientific or economic values which is unreasonable in relation to the benefit derived from the activity in question.”

There was agreement that (b) above should be expanded to include more aspects of the marine ecosystems of interest (see Box 1) and there were questions about (c) with respect to our ability to conduct appropriate cost benefit analysis (further discussed under MIDAS Deliverable D9.5). The importance of assigning values to the ecosystems and their functions and services was recognized, but it was generally agreed that there is currently insufficient understanding to conduct such an analysis. Many felt that the burden of proof should be on the Authority and its 168 State Parties to demonstrate the reasonable trade-offs involved in mining. However, there has been little evidence to date that such trade-offs have been considered by the ISA.

There was agreement that serious harm should be evaluated against the *environmental objectives and targets* of the Authority, and this speaks to the importance of establishing ecologically meaningful objectives early on (See Annex 2). There was agreement with Reg. 7.7 that *No one single component will define serious harm or significant adverse change*. The group discussed whether it might be appropriate to develop a deep-ocean health index, based on an overarching environmental objective to maintain ecosystem integrity, including structures, functions and services. We listed possible components that could be measured to detect serious harm to the marine environment, with appropriate indicators, building on discussions from a workshop on the topic held at Scripps in 2014 (Levin et al. 2016). The group acknowledged the challenge of defining actual thresholds or tipping points, which are difficult to achieve even in well-studied shallow coastal systems. For the features in Box 1, the various habitats under study and different components of each ecosystem will have different temporal and spatial scales of impact. This speaks to the importance of developing and tracking indicators across a variety of scales.

Several possible recommendations were discussed, including: (a) taking a “weight of evidence” approach rather than seeking pre-determined thresholds for serious harm; (b) dealing with the definitional challenges of serious harm on a case by case basis that would identify the various consequences of the activity(ies) in question; (c) developing criteria for adverse change which when applied across multiple dimensions could “add up” to a conclusion regarding serious harm, recognizing that interactions among indicators could convert lesser individual stressors into cumulative serious harm; (d) considering precautionary thresholds/signs (triggering management actions) and absolute limit thresholds/effects (stop actions) (e) ensuring that a strategic environmental assessment is completed and protected no-mining areas are put in place prior to awarding any additional contracts; (f) crafting rules and procedures with built-in flexibility to account for forms of serious harm that are as yet unknown; (g) focusing on harm beyond the ‘authorized’ level of harm by Authority, (h) ensuring scientifically and statistically sound design of the network of Preservation Reference Zones and Impact Reference Zones, as that these will determine the contractor’s ability to detect serious harm (Additionally, broader scale regional sampling will be required because affected habitats and species populations are not likely to be limited to contractors’ mining claim areas.)

There was some discussion concerning whether items in Box 1 should be assessed for feasibility. Some felt that all the items were critical, and that research should be directed to improve feasibility of measurement for the more difficult elements. Others pointed out that the internal capacity of the Authority and its organs was limited. There was agreement on the desirability of DOSI and/or the Authority creating a working group (or workshop) to address the issues of serious harm and how to operationalize the concept in the governance of deep seabed mining.

We recognize the contribution of the ISA document submitted by the Netherlands Government to the issue of serious harm. It discusses mainly *how to address* serious harm rather than providing a scientific definition. The document points out that the conventional civil liability approach is not suitable for addressing environmental loss because it presumes the existence of a natural or legal person (victim) that can present a claim for the damage suffered. It invokes the mitigation hierarchy, and discusses modes of restoration (including out of kind) which is not the topic of concern here (but with which we don't necessarily agree).

BOX 1. Features and Indicators of Serious Harm

- Loss of biodiversity (at different levels and rates)
 - Species richness
 - Species extinction
 - Evenness
 - Phylogenetic distinctness
 - Rarity (species area curve, rarefaction)
 - Endemicity
 - Abundance
- Community structure: species composition (indicator)
- Significant ecosystem components, including ecosystem engineers.
- Habitat (physical and biogenic communities, habitat diversity)
- Endangered species (migration, entanglement, live stage impairment, extinction threats)
- Productivity
 - Biomass
 - Primary productivity
 - Autotroph/heterotroph ratios
- Heterogeneity
- Connectivity
- Respiration (oxygen consumption)
- Nutrient cycling
- Trophic structure (trophic index, SIA, molecular gut contents)
- Demographic structure
 - Age structure
 - Size structure
- Recovery
- Resilience