Template for the review of the draft standards and guidelines associated with the draft regulations on exploitation of mineral resources in the Area

I. Background

1. The draft regulations on exploitation of mineral resources in the Area (ISBA/25/C/WP.1) require that certain issues are addressed in accordance with, or taking into account, standards and guidelines to be developed by the organs of the Authority. The standards will be adopted by the Council and will be legally binding on Contractors and the Authority, whereas the guidelines will be issued by the Legal and Technical Commission or the Secretary-General and will be recommendatory in nature.

2. Stakeholder consultation is an integral part of the process decided upon by the Commission for the development of the standards and guidelines (ISBA/25/C/19/Add.1).

3. The Legal and Technical Commission will consider the comments received through stakeholder consultation during its current session.

4. The drafts include a cover page containing background and contextual information on the approach taken by the Legal and Technical Commission in developing each standard and guidelines. Please note that stakeholder comments are not sought on this cover note.

5. Issues of format and consistency across the standards and guidelines will be reviewed by the secretariat and the Legal and Technical Commission once the content of the various standards and guidelines is finalized following stakeholder consultation.

II. Submitting Comments

6. To ensure that your comments are given due consideration, please send them by e-mail to ola@isa.org.jm, at your earliest convenience but **no later than the date announced on the ISA website for the relevant draft standards and guidelines.**

7. When submitting comments, please adhere to the following guidance as much as possible:

   a. Please provide all comments in writing and in an MS Word .doc or .docx format using the table provided below.

   b. The table format allows for an unlimited number of comments to be added. To add more comments, you may add more rows.

c. Please provide full contact information for the individual/Government/organization submitting the comments.

d. Please avoid commenting on issues related to format, grammar, spelling or punctuation, unless it affects the overall meaning of the text, as the document will be formatted and edited when the final draft is prepared by the Legal and Technical Commission.

e. To facilitate the revision process please be as specific as possible in your comments. In areas where you feel additional or alternative text or information is required, please suggest what this text may look like or what information should be included.

f. Text may be copied from the draft into the table if stakeholders wish to use "track changes" in editing text (this is encouraged to ensure accuracy and avoid numbering errors).

g. If you refer to additional sources of information, please include these with your comments when possible or provide a complete reference or hyperlink.

h. All review comments will be posted on the ISA website, unless otherwise requested by the submitting entity.

8. Should you have any questions regarding the review process, please contact ola@isa.org.jm.

III. Template for Comments

9. Please use the review template below when providing comments.

10. Line and page numbers have been provided in the drafts. Please use these as a reference as illustrated in the table below.

TEMPLATE FOR COMMENTS

Document reviewed	
Title of the draft being reviewed:	Draft guidelines for the establishment of baseline environmental data
Contact information	
Surname:	Johnson
Given Name:	David
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Country:	UK
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General Comments
First impressions are that the guidelines in their current form are thorough and comprehensive, however, several concerns emerge based on experience of ocean-going surveys and reviewing impact monitoring regimes for coastal developments: a. The guidelines are a mixture of 'guidelines', 'Best Practice' recommendations and 'Standard Operating Procedures'. The degree to which these types of documents can be prescriptive or allow certain flexibility of approach is different. Experience dictates that even very limited scope for flexibility can result in vastly different interpretations, not all of which are appropriate. Further consideration of where to be more prescriptive or more flexible is recommended to tighten expectations. A clearer demarcation between what are 'guidelines', 'Best Practices' and 'Standard Operating Procedures' is advisable. b. It is unclear whether the establishment of "baseline" environmental data means establishing a statistically robust baseline on which to base a BACI (or similar) monitoring programme, or the environmental characterisation of an area not previously surveyed. Environmental characterisation is necessary before any baseline-establishing survey can be designed, let alone implemented, and the methodology and considerations for each type of survey are very different. c. Many of the sampling at sea processes described seem idealistic – suitable for rigorous scientific investigations but impractical for large-scale, long-term, remote and challenging monitoring programmes. All procedures described represent several specialist areas of research, each requiring highly trained and specialist personnel who are unlikely to be available or employed by commercial operators to perform such tasks at sea. Data from intricate and time-consuming processes can be rendered invalid or severely compromised if performed by non-specialist (often agency or generalist) personnel. d. The intention to place sampled material in museums for future reference is laudable, but most museums lack the space and resources to curate, store and maintain such collections in perpetuity. No provision appears to be made to support museums as repositories of such material. e. A consideration of the environmental damage of all proposed sampling for monitoring ought to be made, especially for large-footprint/indiscriminate destructive sampling such as trawling. Challenging environments can return many invalid samples before a useable sample is obtained, yet all sampling attempts cause damage (likely permanent in the deep sea).
The draft's introduction (1 bis) should include an acknowledgement that the environmental reference baseline data gathered by Contractors can/should be augmented by relevant peer-reviewed data from other sources.
The Purpose and Scope (p.4, para6) refers to two best practice terms but this is not consistent with the draft standard and guidelines for EIAs (Background, para2). We suggest using all the conventional terms as set out in the latter.

Standard EIA baseline data includes current socio-economic conditions. This heading is missing in para8 and should be included to ensure consistency with other major initiatives such as the Sustainable Development Goals and the CBD's post 2020 Global Biodiversity Framework. This should generate an appropriate section in the Guidelines.

We welcome the emphasis on collaboration and exchange of data (p.8, para27) but how this will happen is not specified or indicated. We believe "wherever possible" is insufficient and contractors should be obliged to convene suitable workshops and submit reports of information exchange achieved to the Authority.

It is widely accepted that biological data is less comprehensive than physical and chemical oceanographic information for deep-sea environments. In most areas there is data deficiency raising the importance of proxys and analogues. For biological communities (section VII) it is critical to understand the relative importance of the area concerned. Biologically rich ecosystems will warrant greater attention throughout the taxonomic spectrum (para232 onwards).

Concerning monitoring sharks and surface nekton (lines 1518 and 2204) the detectability at the surface of these species is in large part due to chance or by biological functions that are not understood

'comparisons with distant sites' (line 1532) – how will these be selected? How many? What monitoring methods?

For the seabirds section (para 326-331), relevant datasets should also include marine Important Bird and Biodiversity Areas (IBAs; https://maps.birdlife.org/marineibas) and Key Biodiversity Areas (KBAs; http://www.keybiodiversityareas.org) – these are typically identified from tracking data (in pelagic areas) and represent important areas for the persistence of biodiversity. Important sites across the whole route potentially affected by the activity (i.e., from port to site), e.g., as a result of an increase in ship traffic (which can have an impact on seabirds via disturbance and pollution, including light pollution), should be also evaluated. These can be assessed in combination with tracking data to identify additional seabird species that may use or cross the site or route as part of their foraging trips or migration (please see specific suggestions).

As much data as possible should be collected from the seabird carcasses, including:

- Diet (stomach content: main prey; recent diet from stomach contents and/or faeces (through analysis of prey remains, DNA and stable isotopes); toxicology (biotoxins, others); marine debris ingestion; parasites; fatty acids (indirect marker of diet during long foraging trips); the stomach or entire digestive track should be removed as soon as possible, and preferably frozen (Barrett et al. 2007). This information could be useful to look at cascade effects, including impacts on prey and consequently shifts in the diet and behaviour of seabirds.
- Tissues (histopathology; analysis of damage caused by diseases, nutritional status, general health state); toxicology (heavy metals, POPs, biotoxins, microplastics); pathogens

(viruses, bacteria, fungi, parasites); genetics (sexing, species identification, geographical origin/migration, phenotypic variation);
- Samples of flight feathers (stable isotopes (diet during known moulting period, geographical origin/migration); corticosterone (stress); contaminants (heavy metals, persistent organic pollutants (POPs), trace elements)).

See: Uhart et al. 2017. Guidelines for sampling tissues from bycaught dead birds. ACAP document.

The section on mortality is too vague - "evidence or reasonable suspicion that contractor's activity is producing seabird mortality in significant numbers" - this is problematic – what is "significant"? For globally threatened species or other long-lived species, even very small numbers of birds dying can cause relevant impacts on the populations. The response to monitor the demography of affected populations is also problematic. Monitoring a decline, without action to reduce the threat or restore the population is meaningless. If there is evidence of mortality, then operations should be stopped and populations monitored to ensure they recover. It would also be prudent to act (i.e. show precaution) before detecting direct mortality, for example, if the area is a foraging hotspot or an important commuting corridor used by a threatened species or by species that are known to be susceptible to the direct and indirect impacts of deep-sea mining.

There is no provision of 'Quality Control / Quality Assurance' protocols for all the various steps (from sampling to eventual reporting) of the monitoring programme.

Specific Comments

Page	Line	Comment
4	88/89	Please replace 'Best Industrial Practice' with 'Best Industry Practice'
55	2203	Monitoring marine mammal presence and habitat use in a given area is not something that can be done with a single survey because of: • the usual very high availability bias of the animals (= not very 'available' to be detected) due to their diving habits, that vary significantly from species to species; • their usual rarity as top predators (which decreases the probability of detecting them if effort is too low; and • their seasonality Para 324 should specify the extent of the area to be monitored, including an appropriate buffer zone, together with the minimal intensity of effort required to provide the information with sufficient power. The goal of monitoring for whales should include defining not just what species occur in the area but also what is the role of the area for those species. If the area does not already fall within an Important Marine Mammal Area (IMMA), the IMMA criteria should be applied as if it were an Area of Interest (AoI) based on the IMMA Standard (https://www.marinemammalhabitat.org/immas/imma-criteria/) to

		understand whether the area hosts threatened marine mammal species and whether it is used for feeding, breeding, or migrating.
55	2219	Attraction and collisions to infrastructures and ships **(both transiting and stationary),** systematic…..
55	2220	The compilation and analysis of previously collected seabird tracking data, **including readily-available layers such as marine important Bird and Biodiversity Area and Key Biodiversity Area datasets,** should also be….
55	2235	**changes in diet** and emerging contaminants, and analysed for contaminants in different tissues…
55	2242	Regularly collated and **analysed to identify important areas at-sea, including Important Bird and Biodiversity Areas (IBAs; https://maps.birdlife.org/marineibas) and Key Biodiversity Areas (KBAs; http://www.keybiodiversityareas.org), and** a number of global initiatives **collating tracking data**, such as the….
55	2251	**Although tracking data is biased towards adult birds, and for some species no tracking data yet exists.**
55	2254	contractors' activity is producing seabird mortality [**in any**] [in significant numbers **(specify)**] on specific seabird populations, **activities should cease, and** monitoring programmes should **be** established to study the demography of **and implement recovery plans for** the affected populations
55	2261	diversity indices and the use of the area **and shipping route** over time
55	2262	from tracking data – proportion of birds from each colony **estimated** to use the area **and shipping route**
55	2269	(liver, muscle, fat and feathers), **stomach content analysis,** and concentration….
9	282-284	"…and statistical methods, such as power analysis (Jumars, 1981), should be used to decide on the sampling effort required to detect relative changes at an appropriate resolution." Replace 'such as' with 'including'. The correct number of replicates cannot be found without using some sort of power analysis and therefore it should be a required statistical method. Note that p 43, lines 1696 – 1697 support this revision, reading: "The number of replicates should be determined and justified using statistical power 1697 analysis." For the sake of consistency, similar language should be used.
34	1319-1321	"…such as power analysis (Sweetman et al., 2019) should be used to assess the sampling effort that is required to detect a change at a specific level and with a specific statistical power." Replace 'such as' with 'including'. The correct number of replicates cannot be found without using some sort of power analysis and therefore it should be a required statistical method. Note that p 43, lines 1696 – 1697 support this revision, reading: "The number of replicates should be determined and justified using statistical power 1697 analysis." For the sake of consistency, similar language should be used.
34	1325-1326	"at a statistical power of at least 0.8." This is an unnecessarily low value; i.e. one out of five times a significant impact could be missed. It should be

		raised to 0.95. Ardron et al. (2019) found that the difference between a power of 0.80 and 0.95 often translated to just one more replicate site. [Reference: Ardron, J.A., Simon-Lledó, E., Jones, D.O., & Ruhl, H. A. 2019. Detecting the Effects of Deep-Seabed Nodule Mining: Simulations Using Megafaunal Data from the Clarion-Clipperton Zone. Frontiers in Marine Science, 6:604.]
44	1740	Some useful measures of diversity and community structure should be listed as required. Otherwise it will be difficult to compare results across studies. We would suggest, at a minimum, density, richness, and Pielou's evenness (Ardron et al. 2019 – above). Other more sophisticate measures should also be encouraged.
45	1780	Unlike page 44 line 1740, density and richness are listed here. In line with our earlier comment, we would suggest adding Pielou's eveness, which in simulations has been found to be sensitive to impacts to community structure (Ardron et al. 2019 - above).
47	1863	per our earlier comments on similar language, we suggest certain diversity measures be explicitly required, including density, richness, and Pielou's evenness (Ardron et al. 2019 – above).
48	1910	Comment: per our earlier comments on similar language, we suggest certain diversity measures be explicitly required, including density, richness, and Pielou's evenness (Ardron et al. 2019 – above).
49	1965	per our earlier comments on similar language, we suggest certain diversity measures be explicitly required, including density, richness, and Pielou's evenness (Ardron et al. 2019 – above).
58	2326-2327	"The power analysis should be presented considering Cohen's d scale of effect size (low d=0.2, medium 2327 d=0.5, high d=0.8) (Cohen, 1988)." In simulations using data from the CCZ, these conventional values for Cohen's d were found to be much lower than what was found to be typical when measuring impacts to megafauna (Ardron et al. 2019 - above). We would recommend language that reflects the possibility that new thresholds suitable for the faunal communities associated with DSM will need to be tested and agreed upon beforehand.
58	2327	"The number of replicate samples required to achieve a power 2328 of 80% should be provided." This is an unnecessarily low value; i.e. one out of five times a significant impact could be missed. It should be raised to 0.95. Ardron et al. (2019 - above) found that the difference between a power of 0.80 and 0.95 often translated to just one more replicate site.
Additional rows can be added to this table by selecting "Table" followed by "insert" and "rows below"		

Comments should be sent by e-mail to ola@isa.org.jm