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Draft regulations on exploitation of mineral resources in the Area

Draft guidelines for the preparation of Environmental Management and Monitoring Plans

Prepared by the Legal and Technical Commission

Contents

* ISBA/27/C/L.1.

List of abbreviations and acronyms

EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMMP	Environmental Management and Monitoring Plan
EMS	Environmental Management Systems
ERA	Environmental Risk Assessment
IRZs	impact reference zones
ISA	International Seabed Authority
ISO	International Organization for Standardization
PRZs	preservation reference zones

I. Introduction

1. Regulation 48 requires that the EMMP prepared and submitted by an applicant for a Plan of Work under the draft regulations on exploitation of mineral resources in the Area (exploitation regulations) must set out commitments and procedures on how mitigation measures will be implemented, how the effectiveness of such measures will be monitored, what the management responses will be to the monitoring results and what reporting systems will be adopted and followed.

2. The present guidelines have been developed to provide practical and technical guidance on the implementation of an EMMP associated with exploitation of mineral resources in the Area, as specified in regulations 13 (3) (b), 31, 38, 42, 48, 49, 50, 51, annex IV, section 11 and annex VII of the exploitation regulations.

3. The guidance below is not intended to be prescriptive, the aim is to provide sufficient direction to enable applicants/Contractors to formulate an approach for environmental management and monitoring. These guidelines should be read in conjunction with the exploitation regulations, the relevant Exploration Regulations, other relevant International Seabed Authority rules, regulations, recommendations and procedures, as well as other relevant standards and guidelines. To the extent of any inconsistency between the present guidelines and the regulations, including their annexes, or any standards, the regulations, including their annexes, and the Standards will prevail.

A. Scope and purpose

4. The scope and purpose of an EMMP as prescribed by the exploitation regulations is to "manage and confirm that Environmental Effects meet the environmental quality objectives and standards for the mining operation" (regulation 48 (1)).

5. "Environmental Effects" as defined by the exploitation regulations means any consequences in the marine environment arising from the conduct of exploitation activities, whether positive, negative, direct, indirect, temporary or permanent, or cumulative effect arising over time or in combination with other mining impacts.

6. Regulation 48 (1) requires that the EMMP outline commitments and procedures on how the mitigation measures will be implemented, how the effectiveness of such measures will be monitored, what the management responses will be to the monitoring results and what reporting systems will be adopted and followed. Regulation 48 (3) requires that the EMMP shall cover the main aspects prescribed by the Authority in annex VII to the exploitation regulations in accordance with the present guidelines, good industry practice, best available scientific evidence and best available techniques.

B. Terminology

7. Unless otherwise stated, terms defined in the exploitation regulations and the United Nations Convention on the Law of the Sea have the same meaning when used in the present guidelines.

- "Regulation" means a regulation in the exploitation regulations.
- The precautionary approach is the approach reflected in principle 15 of the Rio Declaration, which states that: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".

C. Use of the present guidelines in the context of regulations and other standards or guidelines

8. Users of the present guidelines should take steps to check with the Authority whether further standards or guidelines have been issued at the time they prepare their EMMP.

9. **In conjunction with the exploitation regulations:** The exploitation regulations should be strictly followed, and applicable terms used as reference. The applicant/Contractor should also conduct a search for laws, regulations and guidelines published by governing bodies that could be of relevance for the project, including national laws and other industry codes that could be developed from time to time. The present guidelines do not specify any national, state or provincial legislation to retain relevance, given laws and regulations are amended or updated from time to time. The present guidelines promote best practices when used in conjunction with relevant legislation, regulations and procedural guidelines.

10. **In consultation with other EMMP guidance documents and examples:** Additional resources can be found in section 5 of the present guidelines. There are numerous guidance documents from related industries that can provide valuable, relevant approaches to establishing management and monitoring actions.

II. General principles for Environmental Management and Monitoring Plans

11. Environmental management is critical under the exploitation regulations. Applicants and/or Contractors should familiarize themselves with applicable provisions of the exploitation regulations relating to the Marine Environment and EMMPs, including but not limited to regulations 2, 31, 32, 44, 46, 48, 49, 51 and 52.

12. One of the fundamental policies and principles set out in regulation 2 is to provide "pursuant to article 145 of the Convention, for the effective protection of the Marine Environment from the harmful effects which may arise from Exploitation" based on the principle of "a fundamental consideration for the development of environmental objectives shall be the effective protection of the Marine Environment, including biological diversity and ecological integrity", the application of the precautionary approach and "the application of an ecosystem approach".

13. The EIA, EIS and EMMP and relevant regional environmental management plan and Standards are important instruments for adherence to these principles. In accordance with regulation 52, the EMMP shall be subject to regular performance assessment and is therefore a "living document", essentially, to ensure that the commitments made in the EIS are implemented throughout the project life. Consideration of the content of the EIA, EIS and EMMP should commence at the earliest stage of programme and engineering development.

14. An EMMP should:

- Identify scientific uncertainties and include adaptive management strategies and apply the precautionary approach for managing uncertainty, where appropriate;
- Establish specific commitments to auditable and measurable outcomes and clear time frames (with regard to the applicable provisions of the exploitation regulations);
- Outline the actions a Contractor will take in the event that operations result in unanticipated Environmental Effects or EMMP performance objectives are not met;
- Clearly explain technical terms and acronyms used;
- Clearly define responsibilities and roles;

- Be reviewed and updated in accordance with regulation 52.

15. Regulation 48 requires that the EMMP be consistent with other plans, including the Closure Plan and Emergency Response and Contingency Plan. Regulation 48 further provides that the EMMP shall cover the main aspects prescribed in annex VII and shall be:

- Based on the EIA and the EIS;
- In accordance with the relevant regional environmental management plan;
- Prepared in accordance with the applicable guidelines, Good Industry Practice, Best Available Scientific Evidence and Best Available Techniques, and consistent with other plans in these regulations, including the Closure Plan and the Emergency Response and Contingency Plan.

III. Preparing an Environmental Management and Monitoring Plan for submission with a Plan of Work

A. Preparation of Environmental Management and Monitoring Plan for submission of Plan of Work application

16. Annex X, paragraph 3.2 (e), to the exploitation regulations requires that the EMMP be submitted by the applicant to the Authority as part of the application of a Plan of Work for Exploitation.

17. The present section III provides guidance to applicants on the requirements for preparing an EMMP for an application for a Plan of Work.

18. An EMMP checklist has been provided in annex III to the present guidelines to assist applicants/Contractors in determining if all relevant and necessary elements are contained within the EMMP.

B. Project area description

19. In accordance with annex VII, paragraph 2 (b) of the exploitation regulations, the EMMP must contain a description of the area likely to be affected by the proposed activities.

20. That description should be consistent with annex IV, section 3.1, “Project area definition”, to the exploitation regulations (EIS template).

21. Annex VII, paragraph 2 (i), to the exploitation regulations also requires that each EMMP include the location and planned monitoring and management of preservation reference zones and impact reference zones, or other spatial management planning tools. These zones and tools assist Contractors in monitoring and evaluating the impacts of deep seabed mining on the Marine Environment.

22. Annex II to the present guidelines contains checklists established to assist the applicant/Contractor in monitoring IRZs and PRZs.

C. Environmental Management System

23. Annex VII, paragraph 2 (d), to the exploitation regulations requires that an EMMP provide details of the applicant’s EMS and environmental policy. Detailed guidance regarding preparation of the EMS can be found in the EMS guidelines.

D. Environmental Impact Assessment and predicted Environmental Effects

24. Annex VII, paragraph 2 (e) and (f), to the exploitation regulations requires:

- An assessment of the potential Environmental Effects of the proposed activities on the Marine Environment and any significant changes likely to result.
- An assessment of the significance of the potential Environmental Effects and proposed mitigation measures, management control procedures and responses to minimize the harm from Environmental Effects consistent with the EIA and the EIS.

25. The EIA, ERA and mitigation measures are used to prepare the detailed monitoring plans within the EMMP. Detailed guidance regarding an EIA, ERA and EIS can be found in their respective guidelines. The applicant should develop mitigation measures and control procedures for each Environmental Effect identified in the EIA process and described in the EIS. The mitigation measures identified for each potential Environmental Effect identified in the EIA (refer to guideline 2) should then be used to design the monitoring programme(s) (see below). Given the fundamental link between engineering design and environmental outcomes, consideration of mitigation measures should be included from the earliest stages of programme and engineering design.

E. Monitoring and management programme

26. Annex VII, paragraph 2 (g) requires that an EMMP must include a description of:

- The planned monitoring program;
- The overall approach, standards, protocols, methodologies, procedures and performance assessment of the EMMP, including the necessary risk assessment and management techniques, including adaptive management techniques (process, procedure, response), if appropriate, needed to achieve the desired outcomes.

27. Section III.E 1 below provides guidance on management techniques and sections III.E 2 to 4 below on the monitoring programme.

1. Adaptive management

28. Adaptive environmental management:

- Is an iterative approach involving explicit testing of the achievement of defined goals;
- Provides modest and reversible management interventions, to generate further knowledge about the resource being studied.[1] Adaptive management is often portrayed as a multi-step cyclical process involving problem identification, design, implementation, monitoring, and assessment;[2]
- Is important to ensure the linking of ongoing science to decision-making;[3]

29. While inherent uncertainties will take time, gained knowledge and experience to resolve,[4] applicants and Contractors should maintain familiarity with the fundamental principles of the exploitation regulations as set out in regulation 2

[1] Aline Jaeckel, "Deep Seabed Mining and Adaptive Management: The Procedural Challenges for the International Seabed Authority", *Marine Policy* 70 (2016): 205–11, https://doi.org/10.1016/j.marpol.2016.03.008.

[2] Ibid.

[3] Swaddling, "Pacific-ACP States Regional Environmental Management Framework For Deep Sea Minerals Exploration and Exploitation".

[4] Ramirez-Llodra et al., "Strategic Environmental Goals and Objectives for Seabed Mining".

(among other applicable regulations), which include the application of the precautionary approach. Adaptive management is an important part of the implementation of a precautionary approach in that it ensures that the management and monitoring of Environmental Effects is constantly informed by Best Available Scientific Evidence, Best Available Techniques and Best Environmental Practices.

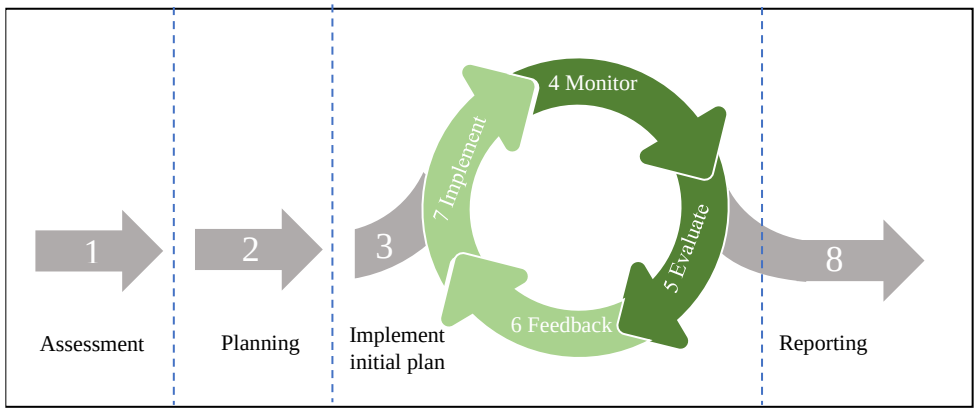
30. Review of management objectives and evaluation of monitoring plans are key components of adaptive management in the context of mineral exploitation in the Area.

31. This adaptive management process will aid in the advancement of scientific understanding of sites at which Mineral Exploitation will occur, mining technologies, impacts and the environment's response, thereby providing critical feedback to inform future decision-making.[5] The adaptive management process will assist an applicant or Contractor in concluding whether they are unable to mitigate or monitor an Environmental Effect in accordance with its EIA, EIS or applicable regulations. In this regard, the EMMP should reflect, among other matters, the applicant or Contractor's obligations under regulation 28 (3) and the applicant or Contractor's temporary closure planning in its Closure Plan.

32. A useful way to describe the implementation of adaptive management is in terms of a setup or deliberative phase during which key components are put in place, and an iterative phase in which the components are linked together in a sequential decision process.[6]

33. The setup phase involves a framing of the resource problem in terms of objectives, management alternatives, models and monitoring protocols. The iterative phase utilizes these elements in an ongoing cycle of learning about system structures and functions and managing on the basis of what is learned (see figure I).

Figure I
Adaptive management feedback loop



Note: Additional links to resources to assist with developing appropriate component monitoring plans are provided in Section VI.B.
Source: Adapted from Williams et al., 2011.[7]

[5] Swaddling, "Pacific-ACP States Regional Environmental Management Framework For Deep Sea Minerals Exploration and Exploitation".
[6] B K Williams, Robert C. Szaro and Carl D. Shapiro, *Adaptive Management: The U.S. Department of the Interior Technical Guide* (Washington, D.C.: U.S. Department of the Interior, 2009), http://pubs.er.usgs.gov/publication/70194537.
[7] Byron K. Williams, "Adaptive Management of Natural Resources – Framework and Issues", *Journal of Environmental Management*, Adaptive management for Natural Resources, 92, no. 5 (May 1, 2011): 1346–53, https://doi.org/10.1016/j.jenvman.2010.10.041.

2. Monitoring programme overview

34. As set out above, the EMMP will include an assessment of the significance of the potential Environmental Effects and the proposed mitigation measures, management control procedures to minimize harm from Environmental Effects and proposed mitigation measures to avoid, minimize and reduce impacts.

35. The implementation of these assessments, procedures and measures requires monitoring to confirm environmental performance and the effectiveness of the implementation strategy (monitoring programme).

36. In addition to the requirements set out in annex VII to the regulations, annex VII, paragraphs 2 (g) and (l), require that the monitoring programme must detail the parameters identified to be monitored and/or sampled during an EIA/EIS to evaluate Environmental Effects and the associated monitoring actions to be taken.

3. Parameters to be monitored

37. The types of environmental parameters that should be monitored as part of exploitation applications in the Area are those studied during the baseline study, EIA and EIS phase, which are further described and/or prescribed in the guidelines for the establishment of baseline data, standard and guidelines for EIAs, and guidelines for the preparation of an EIS.

Monitoring methodology

38. Environmental Effects identified in the EIS will be monitored in accordance with Best Environmental Practices, consistent with annex VII, paragraph 2 (k) and regulation 48 (3) (c) of the exploitation regulations.

39. The specific details relating to the monitoring methodology for each identified potential Environmental Effect will vary based on the planned activities, management objectives, character and magnitude of potential Environmental Effects, site characteristics (while adhering to the exploitation regulations and other relevant standards and guidelines).[8] Monitoring methodology/results should give a sufficient degree of confidence that Environmental Effects are as anticipated and agreed performance standards are being met (monitoring should have the statistical power to detect changes in environmental state). Any variance in specific details relating to each potential Environmental Effect should not be due to a difference in effort, such as the techniques used, available equipment or other resources, including financial and human.

40. The EMMP should describe the types of monitoring to be used through the various phases of exploitation. Types of monitoring include:

- Validation monitoring: this monitoring should take place at the commencement of the project or activity and involves intensive, real-time and comprehensive monitoring to validate assumptions made in the baseline/EIA/EIS phase of the project. Upon the completion of the validation monitoring period, the operation may enter into a “steady state” compliance monitoring period;[9]
- Compliance monitoring: this monitoring should be implemented throughout the project’s operations to monitor the prescribed mitigation measures and assess

[8] Alison Swaddling et al., “Pacific-ACP States Regional Scientific Research Guidelines for Deep Sea Minerals” (Pacific Community (SPC), 2016), https://www.researchgate.net/publication/311104561_Pacific-ACP_states_regional_scientific_research_guidelines_for_deep_sea_minerals.

[9] Leonardus J. Gerber and Renée L. Grogan, “Challenges of Operationalising Good Industry Practice and Best Environmental Practice in Deep Seabed Mining Regulation”, *Marine Policy*, September 2018, S0308597X18304639, https://doi.org/10.1016/j.marpol.2018.09.002.

whether the measures are effective in reducing the impacts to acceptable levels. This monitoring should be conducted periodically, the timing of which will vary from project to project (but which will be agreed with the Authority and set out in the EMMP). It should be used to check that the levels of specific environmental parameters are consistent with applicable regulations, standards, guidelines and contractual obligations. This type of monitoring will assist applicants/Contractors carrying out performance assessments (see section III.F below).

- Long-term monitoring: monitoring of Environmental Effects should continue after completion of operations. This monitoring will be a continuation of some aspects of the compliance monitoring components, but likely with adjusted frequency and timescale. The details of long-term monitoring will be developed in accordance with the Closure Plan. Applicants and Contractors should refer to the standards and guidelines on Closure Plans for further guidance.

41. The effort and resources allocated to monitoring different parameters should be proportionate to the nature and scale of the predicted environmental impacts and effects (subject to complying with the overall objectives and requirements in the exploitation regulations), the level of residual uncertainty from the EIA and the areas of main focus for adaptive management strategies. The monitoring should reflect the sum total of predicted impacts and management strategies, with the aim of determining if the environmental objectives are being achieved. Monitoring methodology/results should give a sufficient degree of confidence that Environmental Effects are as anticipated and agreed performance standards are being met (monitoring should have the statistical power to detect changes in environmental states).

42. It is expected that data collected during Exploration to support the baseline definition of the project will be used in conjunction with data collected in subsequent monitoring activities. The EMMP may need to be modified following the collection of additional data and throughout the monitoring programme (subject to the exploitation regulations, including regulation 57).

43. The applicant should provide a detailed description of the proposed methods and procedures for collecting, analysing and interpreting data.[10] Specifically, for each activity, the applicant should provide information, including but not limited to the following, in accordance with Best Environmental Practices:

- Parameter to be evaluated and a description of what information that particular variable will provide pertinent to a potential Environmental Effect;
- Detailed monitoring/sample collection procedures, including quality assurance/quality control samples;
- List of monitoring/sampling equipment and supplies;
- Specifications of monitoring/sampling equipment (including calibration procedures);
- Laboratory methods and detection limits, if applicable;
- Monitoring/sampling timing and frequency;
- Cleaning/decontamination procedures;
- Record and storage keeping procedures, including raw data, metadata and physical specimens;
- An estimate of the anticipated annual cost of monitoring;

[10] Clark, Durden, and Christiansen, “Environmental Impact Assessments for Deep-Sea Mining”.

- Data organization, analysis and interpretation procedures;
- Proposed methods of presenting the data (maps, photographs, data tables, graphs and live data feeds), including transferability to external databases (for example, DeepData). If the applicant/Contractor possesses the capability, they can use real-time electrical compliance monitoring technology;
- A monitoring checklist specifying when the monitoring must be carried out, who is responsible, what methods will be used to measure effectiveness and if follow-up action is required.[11]

44. The adoption of consistent data collection methodology by applicants/Contractors will enable the Authority to effectively manage the data and combine it to gain a "big picture" understanding of mineral resources and the environments of the Area[12] in the EMMP review and approval process. Applicants/Contractors may identify different/new Best Available Techniques for monitoring, if sufficient justification is provided. Not all sampling methodology is applicable to all resource types and should be evaluated by the applicant/Contractor.

4. Monitoring stations

45. Annex VII, paragraph 2 (h) of the exploitation regulations provides that an EMMP must provide a detailed description of the proposed monitoring stations across the project area, including the frequency of monitoring and data collection, the spatial and temporal nature of such monitoring and justification for such arrangements.

46. Monitoring associated with exploitation in the Area should take place in multiple locations in the project area, including but not limited to:

- Monitoring to evaluate the characteristics of the operational plume and any Environmental Effects;
- Monitoring to evaluate the characteristics of the "returned water" plume and any Environmental Effects;
- Permanent monitoring in locations to assess physical oceanography characteristics such as current speed and direction to inform operational decision-making and any Environmental Effects;
- Monitoring in locations to meet specific monitoring objectives relative to the Environmental Effects identified in the EIS;
- IRZ monitoring;
- PRZ monitoring.

F. Planning performance assessments

1. Overview

47. Annex VII requires that an EMMP include details of the planned performance assessment of the EMMP (annex VII, para. 2 (g)) and the details of the quality control and management standards, including the frequency of the review of the performance of the EMMP (annex VII, para. 2 (l)).

[11] New South Wales Department of Infrastructure Planning & Natural Resources and Planning & Natural Resources Department of Infrastructure, *Guideline for the Preparation of Environmental Management Plans* (Sydney, NSW, Australia 2000: Department of Infrastructure, Planning and Natural Resources, 2004).

[12] Saddling et al., "Pacific-ACP States Regional Scientific Research Guidelines for Deep Sea Minerals".

48. The applicant's description and plan of the performance assessment should be consistent with regulation 52. Therefore, the below guidance links the EMMP description of the planned performance assessment with the requirements in regulation 52.

2. Format

49. Regulation 52 (3) requires that the Contractor compile and submit a performance assessment report in accordance with the relevant guidelines. The format for the performance assessment report can be found in annex I to the present guidelines.

3. Description of the performance assessment

50. In accordance with regulation 52, the planned performance assessment must consider:

- The compliance of the mining operation with the EMMP;
- The continued appropriateness and adequacy of the EMMP, including the management conditions and actions attaching thereto.

51. Each performance assessment should also include, for inclusion in the report that is required under regulation 52 (3):

- An assessment of whether the EMMP is achieving or continuing to achieve its objectives and the requirements of any relevant approval conditions, the contract and the rules, regulations and procedures of the Authority;
- An assessment of environmental monitoring records and the results of any prior assessments;
- An examination of updated external information (academic literature, workshop and technical reports from the Authority or other relevant groups) and environmental data from other sources (namely, published by the Authority on DeepData);
- Any reasons for varying the EMMP;
- The performance assessment criteria (this is detailed further below);
- Information on whether corrective action is required, where corrective actions refer to changes to mitigation measures or monitoring measures to ensure environmental objectives and standards are met (this is detailed further below);
- Information on whether identified corrective actions have been undertaken, and if so, an assessment of the effectiveness of such actions. The results should be used to inform future stages of the project.

52. Contractors should be aware that the specifications in the present guidelines may be revised by the Authority during the implementation of the EMMP, in the spirit of promoting continuous improvement.[13]

[13] CSIR Environmental, "Guideline for Environmental Management Plans" (Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town: Department of Environmental Affairs & Development Planning, Cape Town, 2005).

4. Description of performance assessment criteria

53. Performance assessment criteria should take the form of environmental objectives and standards that are:

- Quantitative and measurable;
- Qualitative, where appropriate and where applicable qualitative goals and standards are available;
- Able to achieve the environmental outcomes when implemented.

5. Description of plan for corrective action

54. Performance criteria should include threshold values or conditions under which corrective actions are taken.

55. Subject to section III.F.6 below, the EMMP should specify:

- Monitoring results which exceed the threshold values for corrective action;
- How monitoring records will be maintained;[14]
- How records of mitigation measures will be maintained;
- When follow up action is required;
- Potential corrective actions;
- Procedures and timelines for reporting non-compliance to the Commission/ Authority.[15]

56. Contractors should ensure their corrective action plan is in accordance with regulation 51 (b), which requires Contractors to implement all applicable mitigation and management measures to protect the Marine Environment, as set out in the Standards referred to in regulation 45.

6. Description of plan in respect of notifiable events

57. Applicants should ensure that their EMMP complies with the exploitation regulations requirements in respect of a "notifiable event", as defined in appendix I to the exploitation regulations and detailed in regulation 34.

58. In particular, applicants or Contractors should note in the EMMP that, if a "notifiable event" is identified during a performance assessment, regulation 34 requires that:

- The Contractor shall immediately notify their sponsoring State or States and the Secretary-General of the happening of any of the notifiable events;
- The Contractor shall, as soon as reasonably practicable, but no later than 24 hours after the Contractor becomes aware of any such event, provide written notification to the Secretary-General of the event, including a description of the event, the immediate response action taken (including, if appropriate, a statement regarding the implementation of an Emergency Response and Contingency Plan) and any planned action to be taken; and
- The Contractor shall ensure that all regulatory authorities are notified and consulted, as appropriate.

[14] Australian Government, Department of Environment, "Environmental Management Plan Guidelines".

[15] Ibid.

7. Description of the frequency of scheduled performance assessments

59. In accordance with Regulation 52, the frequency of a performance assessment shall be in accordance with the period specified in the EMMP.

60. The frequency of the performance assessment should be appropriate to the nature and scale of the impacts and risks of the of the impacts and risks of the activity, with consideration given to the level of confidence in the cause-effect relationship for each risk/impact. Where there is less confidence in the effectiveness of a control measure, it would be appropriate to implement more regular performance assessments. In the context of deep seabed mining, Contractors should plan to carry out performance assessments more regularly as control measures.

8. Description of the non-scheduled and triggered performance assessments

61. The EMMP should include non-scheduled triggers for carrying out performance assessments. For example:

(a) Following a Notifiable Event (see above);

(b) When there is a material adjustment to the relevant regional environmental management plan;

(c) When relevant new or revised rules, regulations, procedures or Standards and guidelines are issued by the Authority.

9. Description of who carries out the performance assessment

62. Applicants should plan for performance assessments to be carried out internally or by independent competent persons (independent competent persons). If they are carried out internally, they should also be done by competent persons. Further guidance on Independent Competent Persons is set out in Section J below. As to competent persons that are not independent competent persons, it is recommended that they:

- Have practical experience with the preparation of EMMPs;
- Have ability, training, knowledge, and/or experience with offshore mining operations and environmental monitoring programs;
- Have the ability to evaluate whether deficiencies are present within an EMMP with specific regard to the monitoring program and performance standards.

G. Mining discharges and waste assessment and prevention audit

1. Overview

63. Regulation 50 provides:

(a) Subject to sub-paragraph (b) below, a Contractor shall not dispose, dump or discharge into the Marine Environment any mining discharge, except where such disposal, dumping or discharge is permitted in accordance with:

- The assessment framework for mining discharges as set out in the guidelines (mining discharge guidelines);
- The EMMP.

(b) Sub-paragraph (a) above shall not apply if such disposal, dumping or discharge into the Marine Environment is carried out for the safety of the vessel or installation or the safety of human life, provided that all reasonable measures are

taken to minimize the likelihood of Serious Harm to the Marine Environment, and such disposal, dumping or discharge shall be reported forthwith to the Authority.

64. Annex VII, paragraph 2 (o) of the exploitation regulations provides that the EMMP must include details of mining discharges, including a waste assessment and prevention audit.

65. "Mining discharge" means any sediment, waste or other effluent directly resulting from exploitation, including shipboard or installation processing immediately above a mine site of minerals recovered from that mine site.

2. Planned management of mining discharge and waste

66. Contractors planned management of mining discharge and waste under an EMMP should be consistent with the exploitation regulations, the mining discharge guidelines, the EIA, the EIS and any relevant conventions, standards, legislation or instruments.

67. To the extent applicable, planned management of waste/discharge should be managed in accordance with the International Convention for the Prevention of Pollution from Ships (see the exclusion of certain seabed mining activities in article 2 (3) (b) (ii)) and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (see the exclusion of certain seabed mining activities in article III (1) (c)). Onshore waste and off-shore waste should be managed in accordance with applicable local directives.

3. Waste assessment and prevention audit

68. The waste assessment and prevention audit should:

(a) Assess the Contractors compliance with its planned management of mining discharge and waste under its EMMP;

(b) Assess mining discharge and waste prevention. To do so, the waste assessment and prevention audit should evaluate:

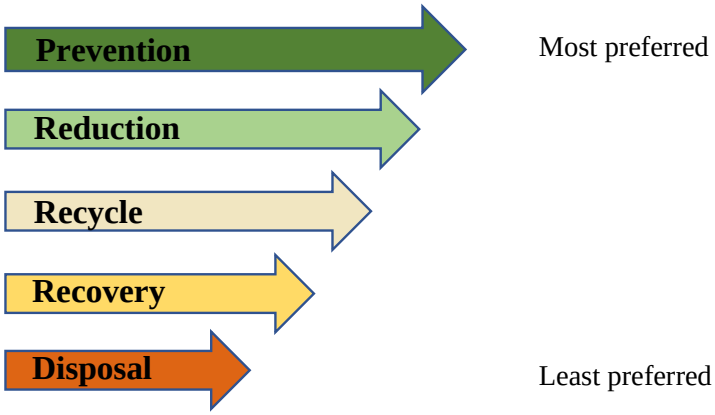
- The amount, type, and hazard of the waste in accordance with the mining discharge guidelines;
- The source of the waste;
- The feasibility of waste prevention or reduction techniques. Waste prevention or reduction techniques may include input substitution, process modification, clean production technology, or a combination thereof.

69. If the waste assessment and prevention audit identifies opportunities for waste prevention at the source, the Contractor should create a waste prevention strategy that includes specific waste reduction targets, with stipulations to ensure that targets are being met.[16]

70. Following a waste assessment and prevention audit, a Contractor should update their planned management of mining discharge and waste under its EMMP. As part of this update, the Contractor should demonstrate that appropriate consideration has been given to the following hierarchy of waste management options, which implies an order of increasing environmental impact, illustrated in figure II.

[16] International Maritime Organization, "1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, as Amended in 2006", 2006.

Figure II
Waste management hierarchy



Source: Adapted from United Nations Environment Programme, Department of Economic and Social Affairs and Food and Agriculture Organization of the United Nations, "SIDS-FOCUSED Green Economy: An Analysis of Challenges and Opportunities" (www.unep.org/greeneconomy and www.unep.org/regionalseas, 2012).

71. The examination of each alternative should include an assessment of the potential effects on the Marine Environment in accordance with the Contractors obligations under the exploitation regulations (including regulations 2 (e) (ii) and 32).

H. Personnel training

72. Successful completion of monitoring activities requires the proper training of personnel, and the EMMP should therefore contain clearly described training protocols. This can be included in the overall training for the site, which is summarized below. Refer to guidelines 6 and 12 for additional guidance on training.

73. Regulation 37 of the exploitation regulations is relevant to the extent that personnel of the Authority and developing states are "engaged or to be engaged in activities in the project area". Training programmes should be developed and implemented prior to the start of exploitation. Training should continue through the exploitation process as engineering design and project execution methods are developed. All training should be documented. The training should be tailored to the role of the individual in the project, with a preference for on-site training whenever possible. When on-site training is not possible, formal, in-class training should be conducted. The EMMP should describe the training to be implemented.

74. Records of all training conducted should be maintained and include:[17]

- The person receiving the training;
- The date the training was received;
- The name and qualifications of the person conducting the training;
- Any records of competency reports or assessments carried out at the conclusion of the training.

[17] Ibid.

I. Report of competent person

75. Annex VII of the exploitation regulations requires that the EMMP is verified by the report of independent competent persons (independent competent person report).

76. The term "competent persons" is utilized in several industries and is generally regarded as persons with ability, training, knowledge or experience to provide review and training and/or take corrective actions in their area of expertise.[18] It is recommended that the independent competent persons who verify the EMMP:

- Have practical experience with the preparation of environmental management and environmental monitoring plans;
- Have ability, training, knowledge and/or experience with offshore mining operations and environmental monitoring programmes;
- Have the ability to evaluate whether deficiencies are present within an EMMP with specific regard to the monitoring programme and performance standards;
- Are not directly employed by the applicant (that is, should be a contracted third party) or any subsidiaries of the applicant; not directly employed by ISA; and should not have been directly involved in the development of an EMMP that is subject to the review or verification of the competent person.

77. The independent competent persons report should include in respect of each independent competent person:

- A statement of the competent person's qualifications and experience;
- A statement of the competent person's independence vis-à-vis the applicant;
- Concise explanations of the method used by applicant under the EMMP;
- Confirmation that the applicant's EMMP and methodology contained therein is sensitive to the economic, geological, environmental and geographic features of the project.

78. Pursuant to annex VII of the exploitation regulations, an applicant must include the competent persons report in their final EMMP submitted with their plan of work application.

J. Additional considerations

79. Environmental data collected under an EMMP is generally information that the Authority is entitled to request.

[18] Examples of "competent persons" definition from the mining industry are provided below. The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ('the JORC Code'), a professional code of practice that sets minimum standards for Public Reporting of minerals Exploration Results, Mineral Resources and Ore Reserves, defines "competent person" as a Member or Fellow of The Australasian Institute of Mining and Metallurgy, or of the Australian Institute of Geoscientists, or of a "Recognized Professional Organization" and as having a minimum of five years' experience working with the style of mineralization or type of deposit under consideration and relevant to the activity which that person is undertaking. The United States Mine Safety and Health Administration (MSHA), a "competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them (30 Code of Federal Regulations 46.2(d)).

80. In this context, in addition to the mandatory reporting requirements, applicants/Contractors are encouraged to agree additional requirements on an individual basis in the EMMP. For example, Contractors may consider providing certain environmental data on a continuous basis to the Authority in real time.

81. On a regular basis (monthly or quarterly), Contractors could provide monitoring reports, including monitoring data, statistical analysis, test results and model validation, assessment of trends and identification of areas for improvement. Contractors should also discuss with the Authority the provision of periodic reports on longer-term Environmental Effects (annually or post-survey, and every 5-year substantive review).

IV. Cost of preparing the Environmental Management and Monitoring Plan

82. Applicants should note that for the purposes of the Financing Plan contained in annex III to the exploitation regulations, they should detail and record the cost of preparing the EMMP. Further guidance in this regard is provided in the guidelines on the Financing Plan.

V. Stakeholder review and public access

83. Applicants/Contractors should familiarize themselves with regulations 11, 17 (3), and 52 (4) in respect of stakeholder engagement and the publication of information.

VI. Performance assessment, review and reporting

84. Contractors should familiarize themselves with the requirements in regulations 38 (1), 38 (2), 51 (1) (a) and 52 in respect of ongoing reporting, performance assessments and consultations with the Commission.

VII. Information sources

A. References

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B. Useful links

Topic	*Internet address*	*Comments*
EMMP general resources		
International Seabed Authority	https://www.isa.org.jm/documents-and-publications https://www.isa.org.jm/central-data-repository	Authority documents, including publications, legal documents, patents and DeepData repository
Pacific Community-European Union Deep Sea Minerals Project	http://dsm.gsd.spc.int/index.php/publications-and-reports	Publications and reports on deep sea minerals, regional environmental management framework, and regional scientific research guidelines
Rules, regulations and procedures		
International Seabed Authority	https://www.isa.org.jm/mining-code/Regulations	The mining code
International Marine Minerals Society	https://www.immsoc.org/IMMS_downloads/2011_SEPT_16_IMMS_Code.pdf	Code for Environmental Management of Marine Mining
International Marine Minerals Society	https://www.immsoc.org/IMMS_code.htm	Code for Environmental Management
Det Norske Veritas	https://www.dnvgl.com/maritime/index.html	Shipping compliance and pollution reduction
American Bureau of Shipping	https://ww2.eagle.org/en/rules-and-resources.html	Safety, compliance and environmental protection on marine and offshore assets
International Maritime Organization	http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/Default.aspx	International shipping and safety law obligations
United Nations Educational, Scientific and Cultural Organization	http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/2001-convention/annex-of-the-convention/	Rules concerning Activities directed at Underwater Cultural Heritage (annex to the Convention on the Protection of the Underwater Cultural Heritage)
Standards and guidelines		
Equator Principles	https://equator-principles.com/best-practice-resources/	Equator Principles and Association Governance Rules
International Organization for Standardization	https://www.iso.org/iso-14001-environmental-management.html	ISO Environmental Management Standards

Topic	*Internet address*	*Comments*
International Finance Corporation	https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_pps	International Finance Corporation Performance Standards on Environmental and Social Sustainability
Extractive Industries Transparency Initiative	https://eiti.org/document/eiti-standard-2019#download	Extractive Industries Transparency Initiative Standard
Activity-specific component plan development resources		
Activity design and integrity	https://www.ourenergypolicy.org/wp-content/uploads/2014/06/OMF.pdf	Provides information and methods to ensure alignment with equipment design, working methods and operations procedures
Ecological monitoring	https://www.researchgate.net/publication/311104561_Pacific-ACP_states_regional_scientific_research_guidelines_for_deep_sea_minerals	Provides information about targets, indicators and thresholds for sustaining marine ecosystem integrity
Monitoring techniques and methods	https://www.researchgate.net/publication/311104561_Pacific-ACP_states_regional_scientific_research_guidelines_for_deep_sea_minerals	Provides aspects to be included and parameters to be measured in monitoring plans, including geology, sediment and seafloor communities.
Methods for resource mapping and monitoring	https://www.norskoljeoggass.no/contentassets/13d5d06ec9464156b2272551f0740db0/handbook-shec-mapping-assessment-and-monitoring-v0-final-signed.pdf	Provides methods for mapping and monitoring of seabed communities
Noise management	https://cetsound.noaa.gov/Assets/cetsound/documents/Roadmap/ONS_Roadmap_Final_Complete.pdf	Provides strategies for assessing ocean noise impacts
Noise and vibration management	https://www.dpti.sa.gov.au/__data/assets/pdf_file/0004/88591/DOCS_AND_FILES-7139711-v2-Environment_-_Noise_-_DPTI_Final_word_editing_version_Underwater_Piling_Noise_Guide.pdf	Guidelines for management and mitigation of underwater piling noise
Lighting management	https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/Offshore-Lighting-Guidance.pdf	Guidance of offshore lighting management
Ballast water management	http://library.arcticportal.org/1913/1/International%20Convention%20for%20the%20Control%20and%20Management%20of%20Ships%27%20Ballast%20Water%20and%20Sediments.pdf	International Convention for the Control and Management of Ships' Ballast Water and Sediments

Annex I

Environmental Monitoring and Management Plan (EMMP) [Example, table of contents/form of performance assessment]

Annex II

A. Checklist of monitoring criteria for impact reference zones and preservation reference zones: polymetallic nodules in the Area

Item	*Criteria*	*Description of how the plan addresses the criteria, or rationale for alternate criteria*
	Monitoring	
1.	It is recommended that experiences from other sectors be leveraged in the development of monitoring approaches and designs.	
2.	It is recommended that collected biological samples be appropriately archived in a reputable museum or research institute, if possible.	
3.	Data standards should be backwards-compatible.	
4.	Impacts predicted in the EIA should be monitored at sites using stratified sampling design within IRZs to assess impact across all habitat types, direct and indirect impacts, and spatial scales. Without limiting the types of impacts that should be identified by the contractor in the EIA and reported in the EIS, the contractor should consider the following non-exhaustive list of key impacts to be monitored: • Physical removal/direct alteration of substrate, sediment and biota • Change in geochemistry of the seabed substrate • Changes to seafloor integrity • Release of heavy metals and other contaminants as well as potential accumulation through the food chain • Effects on the organisms and communities by plumes (such as smothering or effects on suspension feeders) • Potential effects on plankton or nekton and mesopelagic fishes from the seafloor or discharge plumes • Turbidity reducing visibility in the water column for predatory fish • Potential impacts on commercial fish, fisheries, marine mammals and migratory vertebrates such as turtles and sharks • Noise and light • Changes in water column properties	
5.	Further refinement is needed for monitoring variables to be measured in keeping with the spatial and temporal nature of the project.	
6.	Contractors should consider variance and statistical power in PRZ and IRZ monitoring.	
7.	The contactor should monitor IRZs and PRZs for at least the duration of any mining activity and in accordance with the Closure Plan.	

Abbreviations: EIA, Environmental Impact Assessment; EIS, Environmental Impact Statement; IRZ, impact reference zone; PRZ, preservation reference zone.

B. Checklist of monitoring criteria for impact reference zones and preservation reference zones: polymetallic sulphides in the Area

Item	*Criteria*	*Description of how the plan addresses the criteria, or rationale for alternate criteria*
	Monitoring	
1.	Experiences from other sectors should be leveraged in the development of monitoring approaches and designs.	
2.	It is recommended that collected biological samples be appropriately archived in a reputable museum or research institute, if possible.	
3.	Data standards should be backwards-compatible.	
4.	Stratified sampling design to monitor within IRZs and PRZs should be used to assess impact across all habitat and impact types.	
5.	IRZs should be designated and monitored to assess all impacts from mining activities within and outside the contract area.	
6.	Impacts predicted in the EIA should be monitored at sites using stratified sampling design within IRZs to assess impacts across all habitat types, direct and indirect impacts, and spatial scales. Without limiting the types of impacts that should be identified by the contractor in the EIA and reported in the EIS, it is recommended that contractors consider monitoring the following list of non-exhaustive impacts: • Sediment alteration/removal • Smothering • Marine mammal populations • Noise and light • Plume – operational and discharge • Changes in fluid flux • Faunal removal • Trophic ecology • Habitat loss or change • Homogenization of habitat • Taxonomic composition change • Ecotoxicology • Sediment restructuring • Community Structure • Community Function • Productivity	
7.	Further refinement is needed for monitoring variables to be measured in keeping with the spatial and temporal nature of the monitoring.	

Item	*Criteria*	*Description of how the plan addresses the criteria, or rationale for alternate criteria*
8.	Contractors should consider variance and statistical power in PRZ and IRZ monitoring.	
9.	The contractor should monitor IRZs and PRZs for at least the duration of any mining activity and in accordance with the Closure Plan. In the context of the Closure Plan, there should then be a review to assess the relative importance of mining impacts and evaluate if any longer-term effects (residual Environmental Effects) must be monitored for a reasonable period after the activities in mining area.	

Abbreviations: IRZ, impact reference zone; PRZ, preservation reference zone.

C. Checklist of monitoring criteria for impact reference zones and preservation reference zones: cobalt-rich crust areas

Item	*Criteria*	*Description of how the plan addresses the criteria, or rationale for alternate criteria*
	Monitoring	
1.	Experiences from other sectors should be leveraged in the development of monitoring approaches and designs.	
2.	It is recommended that collected biological samples be appropriately archived in a reputable museum or research institute, if possible.	
3.	Data standards should be backwards-compatible.	
4.	Impacts predicted in the EIA/EIS should be monitored at sites using stratified sampling design within IRZs to assess impact across all habitat types, direct and indirect impacts and spatial scales. Without limiting the types of impacts that should be identified by the contractor in the EIA and reported in the EIS, the contractor should consider the following non-exhaustive list of key impacts to be monitored: • Physical removal of crusts, sediment and animals • Change in texture and geochemistry of the seabed substrate • Release of heavy metals and other contaminants as well as potential accumulation through the food chain • Smothering or other effects on the biology of benthic animals by sediment from the plume • Potential effects on plankton, nekton and mesopelagic fishes from the seafloor or discharge plumes • Turbidity reducing visibility in the water column for predatory fish • Potential impacts on commercial fish, fisheries, marine mammals and migratory vertebrates such as turtles and sharks • Noise and light • Changes in water column properties	
5.	Without limiting the types of metrics that should be identified by the contractor in the EIA, EIS and EMMP, the contractor should consider assessing changes in the following non-exhaustive list of key metrics: • Composition, abundance and condition of epibenthic species, sediment properties such as physical (such as sediment thickness and particle size) and geochemical characteristics. • Water column characteristics such as turbidity and dissolved oxygen measured by sensors on conductivity-temperature-depth instruments or moorings (landers) with a variety of sensors (such as turbidity sensors, dissolved oxygen, temperature, salinity, current metre or Acoustic Doppler Current Profiler, sediment traps and hydrophone for acoustic monitoring of a change in behaviour or distribution of marine mammals). Furthermore, the Contractor should undertake regular conductivity-temperature-depth instrument casts in both IRZs and PRZs throughout the water column.	

Item	*Criteria*	*Description of how the plan addresses the criteria, or rationale for alternate criteria*
	• The concentrations of heavy metals and contaminants in the sediment and the water column.	
	• Composition and abundance of plankton if there are oceanographic retention situations such as closed-circulation cells (Taylor columns) which may also lead to increased bioaccumulation in sessile filter-feeders, plankton and predatory fish.	
6.	Further refinement is needed for monitoring variables to be measured in keeping with the spatial and temporal nature of the monitoring.	
7.	Contractors must consider variance and statistical power in PRZ and IRZ monitoring.	
8.	The contractor should monitor IRZs and PRZs for at least the duration of any mining activity and in accordance with the Closure Plan.	

Abbreviations: ADCP, Acoustic Doppler Current Profiler; CTD, conductivity-temperature-depth instrument; EIA, Environmental Impact Assessment; EIS, Environmental Impact Statement; EMMP, Environmental Monitoring and Management Plan; IRZ, impact reference zone; PRZ, preservation reference zone.

Annex III

Environmental Monitoring and Management Plan (EMMP) review form

EMMP component	*Does the EMMP contain:*	*Draft regulations requirement*	*Do the components of the EMMP meet these requirements?*	*EMMP reference*
Project description	Project goals and objectives	Regulation 48 (1); regulation 50; annex VII, paragraph 2 (b), (m), (o) and (q)	Does the EMMP identify clear project goals and objectives?	
	Project stakeholders		Is there a list of the stakeholders containing: • each stakeholder's role on the project; • how/when they will be consulted during the project?	
	Contractor project design brief		Does the project design brief summarize the dialogue between the Contractor with persons affected by, or interested in, the activity? Does it take into account their input and reference them directly?	
	Organizational structure and responsible parties		Does the EMMP describe how the Contractor's environmental team fits into the organizational structure? Does it outline the responsibilities of key personnel?	
	Mining technology and methods		Are mining technology and methods explained step-by-step? Does the EMMP include a discussion regarding best available techniques?	
	Waste assessment and prevention audit		Does the EMMP describe every potential waste generated, waste characteristics and the way that the waste will be disposed of? Is it clear that the Contractor has implemented recycling and waste reduction techniques whenever possible?	

EMMP component	*Does the EMMP contain:*	*Draft regulations requirement*	*Do the components of the EMMP meet these requirements?*	*EMMP reference*
Environmental Management System	Organizational structure and responsibilities	Regulation 46 (1) and annex IV (11.1)	Are the roles of key personnel outlined? For every person defined as being key personnel, is it clear how they support site-specific environmental objectives?	
	Environmental Management System and Contractor environmental policy	Regulation 46 (2) and annex, para. 2 (d)	Does the EMMP include a discussion of the Contractor's environmental policy? Does the Contractor describe their over-arching environmental management system and how the EMMP fits into that system? Is there a clear route for reporting to senior management to ensure regular evaluation of the monitoring and management? Is the EMMP accessible and presented in a format that allows contractor personnel and contractors to understand the purpose and procedures, particularly in the case of actions to be taken if thresholds are exceeded? Is there an appropriate mechanism to store monitoring data and metadata in a way that allows for evaluation of changes over time?	
Environmental Impact Assessment, risk assessment, and mitigation hierarchy monitoring programme	EIA and potential Environmental Effects	Regulation 48 (3) (a) and annex VII, para. 2 (e)	Are all potential Environmental Effects identified in the EIA discussed in the EMMP? If a potential Environmental Effect results in a significant change in the project site, does the EMMP assess the Effect and the severity of the change, and explain further mitigation measures? Does the EMMP describe mitigation measures for all potential Environmental Effects identified in the EIA? Does the EMMP cite reputable sources confirming that the mitigations measures proposed represent good industry practices?	
	Risk assessment	Annex VII (2) (g)	Does the EMMP describe the environmental risk assessment techniques used to assess each potential Environmental Effect?	

EMMP component	*Does the EMMP contain:*	*Draft regulations requirement*	*Do the components of the EMMP meet these requirements?*	*EMMP reference*
	Mitigation hierarchy	Annex VII, para. 2 (f) and regulation 47 (1) (d)	Does the EMMP identify how the mitigation hierarchy was employed for the identification of mitigation strategies for each Environmental Effect?	
	Monitoring programme and component plans summary	Regulation 48 (1), annex IV, section 11.3.1	Does the monitoring plan identify each Environmental Effect documented in the EIS?	
			For each Environmental Effect deemed significant, is there a component plan and/or mitigation strategy?	
			Is each component plan a detailed, stand-alone document?	
	Component management and monitoring plan development	Annex VII, para. 2 (g)	Is each component plan specific to the planned activities, management objectives, characteristics, project area, equipment and resources of the project?	
	Monitoring methodology	Annex VII, para. 2 (g), annex IV, section 11.3.2	Does each component plan provide a detailed description of the proposed methods and procedures for collecting, analysing and interpreting data?	
			Is it documented that the proposed monitoring/sampling methods are appropriate for the parameter?	
			Are the proposed monitoring/sampling/storage methods approved by pertinent regulatory agencies/bodies or agreed upon in reputable literature?	
			Does the sampling methodology allow for the detection of expected Environmental Effects from the exploitation activities?	
	Monitoring stations	Annex VII, para. 2 (h) (i)	Does each component plan provide a detailed description of the proposed sampling/monitoring locations and the spatial arrangement of proposed sampling locations?	
			Is justification for the proposed sampling arrangement provided?	
			Are IRZs and PRZs clearly defined and justified?	

EMMP component	*Does the EMMP contain:*	*Draft regulations requirement*	*Do the components of the EMMP meet these requirements?*	*EMMP reference*
	Performance standards	Annex VII, para.2 (c) and (j)	Have performance standards been developed for each monitored parameter that will be used to assess whether the mitigation actions have been effective?	
			Are performance criteria quantitative and measurable, to the extent practicable? If not, are qualitative goals and standards applicable?	
			Are these performance standards based on reputable literature and/or on work by pertinent regulatory agencies/ bodies?	
			Are threshold values or conditions under which corrective actions are necessary provided for each monitored parameter?	
			Does each component plan include procedures for identifying the need for corrective action and procedures for reporting non-compliance?	
			Are proposed corrective actions supported by reputable literature or pertinent regulatory agencies/bodies?	
	Adaptive management	Annex VII, para. 2 (g)	Are the basic principles of adaptive management defined, allowing the reviewer to confirm that the Contractor understands its principles?	
			Is an adaptive management plan provided that identifies the key iterative phases of the plan (decision-making, monitoring and assessment)?	
			Does the adaptive management plan include a phase to evaluate monitoring results with respect to stakeholder input, project objectives, management alternatives, updated models and/or monitoring protocols?	
	Quality control and management standards	Annex VII, para. 2 (l), regulation 52 (3)	Does the EMMP include details of the quality control and management standards, including the frequency of the review of the performance of the EMMP?	
			Does the EMMP set out the frequency with which a performance assessment report should be submitted and details as to what is to be contained in this report?	

EMMP component	*Does the EMMP contain:*	*Draft regulations requirement*	*Do the components of the EMMP meet these requirements?*	*EMMP reference*
	Reporting	Annex VII, para. 2 (s)	Does the EMMP include details of reporting requirements and timing?	
Best practices	Best practices evaluation	Annex VII, para. 2 (k) and (m)	Does the EMMP include a description of a system for ensuring that the plan adheres to Good Industry Practice, Best Available Techniques and Best Available Scientific Evidence?	
			Does the system provide detail for how the Contractor will effectively engage stakeholders and independent experts to continuously review monitoring, data collection and data evaluation techniques?	
			Does the EMMP detail a system for consideration of cumulative impacts of the proposed activities?	
			Does the EMMP detail a system for consideration of other marine users?	
			Does the EMMP include a description of how these practices are reflected in the proposed exploitation activities?	
Consultation and research	Ongoing consultation and research	Annex VII, para. 2 (p) and (r)	Does the EMMP provide a description of relevant stakeholders and parties identified to have interests in the proposed project area?	
			Does the EMMP detail the protocol for ongoing review and modification of the description of stakeholders and interested persons?	
			Does the EMMP provide a schedule and detailed protocol for consultation and cooperation activities?	
			Does the EMMP provide a method of analysing and identifying ongoing opportunities to collaborate with other stakeholders or interested persons on environmental studies?	
Training programme	Types of training required, personnel requiring training and record-keeping requirements	Annex VII, para. 2 (n)	Does the training programme include training requirements for each proposed operational and monitoring activity?	
			Is training tailored to the roles and responsibilities of personnel?	

EMMP component	*Does the EMMP contain:*	*Draft regulations requirement*	*Do the components of the EMMP meet these requirements?*	*EMMP reference*
			Is it clearly stated which key personnel roles will undergo which training and when?	
			Does the structure of the training programme allow for training programmes to be added as the project evolves?	
			Is it clearly stated how training records will be maintained?	
Closure Plan		Annex IV, section 11.3.3	Does the EMMP include an overview of what the Closure Plan will entail (with the full details included in the separate document, the Closure Plan)?	
Reporting	Report submittal to the Authority and data-sharing for regional environmental management	Regulation 48 (3) (b) and annex IV, section 11.4	Has the EMMP been reviewed and verified by an independent competent person with applicable experience? Are the competent person's qualifications provided in the document?	
			Does the EMMP document the Contractor's understanding of annual reporting requirements?	
			Are there details regarding the timing of each reporting requirement?	
			Are provisions included for uploading data to the Authority's DeepData database?	
			Does the EMMP outline how incidents will be reported and managed?	