

EHS Dredging and Reclamation Guidelines

FIRST EDITION

MARINE ENVIRONMENT & WILDLIFE DEPARTMENT
ENVIRONMENT, HEALTH & SAFETY DIVISION

TABLE OF CONTENTS

Definition of Terms-----	3
Preamble-----	5
Objective of this Guideline-----	6

PART ONE:

1. Environmental Controls for Dredging and Reclamation-----	7
1.1 Excavation-----	7
1.1.1 Scale/size of applied dredging activity and commensurate requirements of EHS-----	8
1.1.2 Biological Baseline of the Proposed Dredge Site-----	8
1.1.3 Dredging Plan -----	9
1.1.4 Public acceptance -----	9
1.2 Transportation-----	10
1.3 Spoil Disposal-----	10
1.4 Reclamation -----	11
1.5 Other Requirements-----	12
1.5.1 Assessment and Studies (water, sediment etc.) -----	12
1.5.2 Monitoring -----	15
1.5.3 Environmental Management-----	15
1.5.4 Dredging and Reclamation Design-----	15
1.5.5 Pollution Control (Water, noise, air, groundwater etc.)-----	16

PART TWO:

2. No Objection Certificate to Allow Conduct of Dredging and Reclamation Activity-----	17
2.1 Application process-----	17
2.1.2 Application Attachments-----	17
2.2 Reporting-----	18
2.3 Safety of Records-----	18
3. Administration and Enforcement-----	18
3.1 Regulatory body-----	19
3.2 Administration -----	19

Definition of Terms

Algal Bloom	A large population density of a phytoplankton. Such blooms are normal, but become of concern when the species in bloom is toxic
Anaerobic Sediment	Sediment lacking oxygen. They usually contain high levels of iron Sulphide, causing them to be black in color. Anaerobic sediments release hydrogen (rotten-egg gas) when exposed to air.
Beach re-nourishment	The process of adding sand to a beach to alleviate erosion or to improve an amenity
Benthic Community	The assemblage of organisms that live in and on the seafloor
Bund	A wall constructed to retain spoil
Capital Dredging	Dredging to create new channels or to enlarge or deepen existing channels and port areas
Capping	The deliberate covering of contaminated sediment on the seabed with clean sediment to contain the contamination
Contaminants	Substances (elements, compounds, particles etc.) that are present in the sediments to be dredged and have the potential to cause adverse biological effects
Draghead	The intake of a trailing hopper dredge.
Dredging	The excavation of material to provide and/or increase the dimensions of a waterway, or to obtain materials, excluding fishing activities such as trawling and shellfish dredging
Elutriation test	Procedure for estimating the concentration of contaminants that could be released during sea dumping. Based on the concentration of contaminant in seawater after a mixture of one part sediment is shaken with four times its volume of seawater for an hour and left to settle for a further hour.
Fluidization	The process that changes the properties of solids (e.g. clays) so that they behave like liquids.

Maintenance dredging	Done to ensure that existing channels, berths or construction work are maintained at their design specifications.
Proponent	The agency or organization proposing any dredging or disposal operation.
Spoil	Material obtained by dredging
Spoil ground	Location at which dredged material is disposed in an aquatic environment
Toxicity	Degree of being poisonous or otherwise harmful to plant, animal or human life
Toxicity testing	Procedures that evaluate the toxic effects of substances on organisms.
Turbidity	A measure of the clarity of water

Preamble:

Dredging has become a usual part of development projects that has re-shaped UAE, particularly Dubai. While the breakthrough projects provided synonymous picture to its fast-paced commerce towards a more dynamic stepped-up economy from the petrol-led business, dredging activities; spoil disposal and reclamation activities earned paralleled impacts to the environment.

From a traditional way of maintaining ports and harbors, desilting drainage and waterways, dredging has become an evolved technology to excavate and transport enormous sand and sediment for land reclamation, nourish beach and even build artificial islands. The activities not only altered the natural seascape and changed hydrodynamics, some dredging, disposal and reclamation also caused loss of valuable flora and fauna, either immediate extraction during dredging or buried during spoil disposal and reclamation or during settlement of silt.

While dredging and reclamation intends to bridge the growing requirements to build important infrastructures for industrial; housing and other purposes towards development, this guideline provides the standards, controls and procedures to be implemented not to compromise the state of the marine environment in the process and in the future.

Objective of this Guideline:

- Provide mandatory requirements for environmentally acceptable dredging, spoil disposal and reclamation activity allowed by this Authority within its jurisdiction;
- Discuss application procedures to get an EHS No Objection Certificate to Allow Dredging and Reclamation Activity within EHS-Trakhees jurisdiction;
- Compliance by certificate holder and the commensurate penalties (monetary and administrative) otherwise;
- Regulate dredging and reclamation works considering the implementation of an acceptable management and mitigation measures.

PART ONE:

1. Environmental Controls for Dredging and Reclamation

A broad range of issues are connected with any dredging and reclamation activity commonly grouped in major critical points as 1.) Excavation; 2.) Transportation; 3.) Disposal; and 4.) Reclamation.

Control measures and applicable systems and standards developed and implemented by this Authority are focused on these four major issues.

1.1 Excavation

Before any digging, mining or excavation activity of sea substrate can commence, basic information should be presented by the proponent to this Authority for review and granting of an EHS NOC to Allow Dredging and Reclamation Activity. The information will be utilized as basis for assessing possible impacts of the proposed activity and shall be determinant for the issuance or rejection of the application by EHS.

- Scale of the proposed activity. Applications which are assessed to have large economic, social and environmental impacts should be referred to higher Authorities and other department of EHS to subject for Environment Effects Statement (EES) or EIA;
- Biological environments (flora and fauna) profile of the site;
- Quantity of sediments to be dredged, depth;
- Contamination level
- Dredge site and its distance to the proposed disposal site;
- Physical characteristics of sediments in the excavation site;
- Dredge technology to be employed;
- Site Conditions;
- Others as needed.

1.1.1 Scale/size of applied dredging activity and commensurate requirements of EHS

Quantity (m ³)	Fees	Other Requirements
100,000 and below (Maintenance Dredging only)	<ul style="list-style-type: none"> ▪ Processing charges for EHS NOC to Allow Dredging Activity 	Copy of Environmental Impact Study
100,000 – 500,000	<ul style="list-style-type: none"> ▪ Environment User’s Fee of 1% of the project cost ▪ Processing charges for EHS NOC 	Environmental Impact Study
>500,000	<ul style="list-style-type: none"> ▪ Environment User’s Fee of 1% of the project cost ▪ Processing charges for EHS NOC 	<ul style="list-style-type: none"> ▪ Full blown EIA Study ▪ Permits/Clearances from other statutory Authorities

Other than the requirements named in the table, dredging activities of all sizes should be applied and approved by EHS using the application forms from EHS website and complete with all required attachments.

1.1.2 Biological Baseline of the Proposed Dredge Site

A comprehensive study of the biological value of the proposed site should be conducted by the proponent. This would include inventory of marine species, both flora and fauna (corals, sea grass, fish etc.) for the dredge site and at least 50 meters radius periphery as impact zone.

This shall determine sensitive marine species that could be affected by the applied activity that will be utilized in evaluating the application. Should applied dredging, disposal and reclamation activity is justified impacting minimal and acceptable segment of marine life, then other activities (coral translocation permit etc.) under other regulations can be required by EHS.

Baseline studies should be carried-out by accredited third party and should be supported by representative photo documentation to be attached in the report.

1.1.3 Dredging Plan

This comprehensive document should present in detail all important information related to the proposed activity. This should include the items listed below, among others:

- Dredge site selection
 - *Sea condition (impounded water, sheltered water, exposed water)*
 - *Description whether site has heavy traffic or confined activities*
- Availability and production rate (should include physical quality of sediment, amount to be dredged, depth etc.)
 - *Justify depth and width of channels, amount of spoil to be dredged*
- Timing of dredging activity
 - *Should likely be implemented when the sea and marine species are least vulnerable (off-season for algal blooms, off season for fish spawning etc.)*
- Spoil Analysis (chemical and organic contents, contamination level etc.)
 - *Loose silt, cohesive silt, fine sand, medium sand or coarse*
- Dredging technology to be employed
- Dredging equipment
- Impact control measures (water, sediment, noise etc.)
 - *In accordance with the most current code of best practice approved by the Authority;*
 - *Local exceedance are confined to the smallest practicable area and over the shortest practicable time in the vicinity of the dredging and disposal operations;*
 - *Re-suspension and/or dispersal of sediments or accumulated contaminants will not be detrimental to the long term protection of beneficial uses;*
 - *In place systems to minimize effects to water quality;*
 - *Support activities to avoid erosion of catchments;*
 - *Control possible release of contaminants.*
- Plan to reverse impacts of dredging and spoil disposal for re-colonization and full recovery of environment

1.1.4 Public acceptance

Proponents of the applied dredging activity should consult and earn acceptance of the other stakeholders within the proposed site. This could be accomplished by engaging into public consultations to present and discuss positive and negative points relevant to the project.

Should dredge area have no direct stakeholder to be consulted; indirect users (fisherman organization etc.) of the area should be conferred with.

However, if approval has been issued by other statutory Authorities, an NOC can be applied even and approved without public acceptance.

1.2 Transportation

Mobilization of dredged materials from dredge site to its disposal site is another critical point to be standardized and regulated by this Authority. This stage poses possible threats which would include liquefied sediment run-offs, introduction of invasive species, influenced hydrodynamic that can result to silt re-suspension, water turbidity, siltation etc. of critical ecosystems (coral patches, sea grass meadows etc.) outside dredge site and its buffer periphery.

It is for this reasons that some standard requirements are named in this guideline:

- Registration of vessel to be used for transport of dredged materials;
- Distance of reclamation project from the proposed beneficial use site;
- Site accessibility;
- Required transport;
- Load and estimated number of trips;
- Use tides to assist entry of deep-draught vessels
- Contain possible release of contaminants during transport;
- Monitoring and mitigation of release of nutrients contained within pore water from dredged sediments (nutrient level released to water should be monitored specially during season of algal blooms);
- Nutrient reduction plan;
- Control of turbidity;
- Mitigation of overflow of fine sediments.

1.3 Disposal

Disposal of spoil for purposes of discharging the dredge materials is another critical point covered by this guideline. While non-utilization and maximization of spoil is discouraged, some dredging activities just dispose of the spoil in land or in open waters, this section only focus on disposal done in the marine environment.

This is practiced most often by maintenance dredging activities for ports and channels which has accretion of bottom sediments.

Dumping of dredged materials to open coasts or water not for purposes of beach nourishment, reclamation and others must satisfy the below requirements of this Authority.

- Disposed only in approved disposal grounds with future area utilization is pre-identified in the land-use classification and plan as determined by the State and other statutory Authorities;
- Tested free from chemical and organic contaminants;
- Analyzed free from invasive species;
- Analyzed sediment characteristics as identical to bottom sediment of disposal site;
- Appropriate environmental management measures in place (silt curtains etc.);

- Control, management and satisfactory discharge plan;
- In place control measures to maintain water and sediment quality;
- Avoid use of temporary disposal grounds;
- Establish spoil disposal arrangements for maintenance dredging for new and ongoing dredging that minimize long term impacts.

1.4 Reclamation

Reclamation projects, as of drafting of this guideline, have been a major purpose for dredging activities. While the purpose of building artificial islands is well meaning in support of infrastructure projects for the growing demand for housing; industries and other, measures and regulations to protect the natural resources has to be in place.

Below are few of some of the mandatory requirements set by this Authority to justify application for reclamation. Other related information/certifications etc. can be required by this Authority to merit granting of the EHS NOC to Allow Conduct of Dredging and Reclamation Activity.

- Building of artificial island or any form of reclamation must ensure consistency with long term protection of beneficial uses, particularly the maintenance of natural aquatic ecosystems;
- Dredge spoil disposal to area being reclaimed should be practicable and environmentally safe using sound international standards and requirements herein specified in this guideline;
- Appropriate environmental management plan (construction and post construction phase) should be pre-identified and submitted in the application as required attachments;
- As much as possible, use of technologies like confined disposal for appropriate containment of fluidized clays and other types of spoil to minimize environmental impacts;
- Justification based on studies, modeling and other in-depth assessment that reclamation project, including its design, location, size etc. will not result to environmental problems including, but not limited to alteration of hydrodynamics that can result to build-up of nutrients, erosion among others;
- Description of utilities that will be developed in the reclaimed area and its operational design for evaluation of possible effects to marine environment during operational stage.

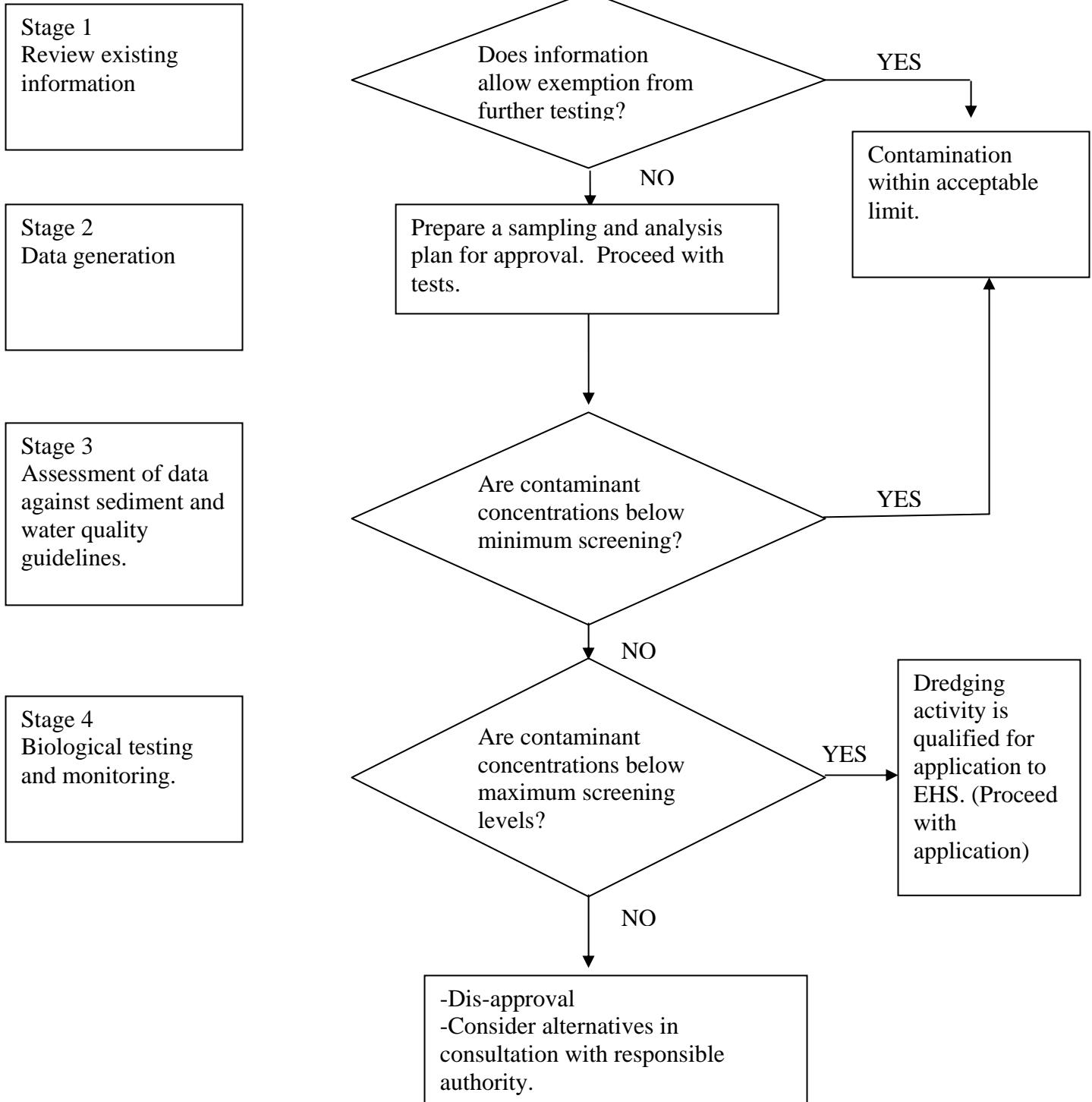
1.5 Other Requirements

Although some were cited in the separate sections above, other requirements are herein presented to be complied with by dredging and reclamation proponent.

1.5.1. Assessment and Studies (water, sediment etc.)

- Site evaluation
 - *Utilization/uses of area (fishing, shellfish harvest area etc.)*
 - *Facilities in the area (mussel farms etc.)*
- Technical guidelines for assessment of chemical contamination of dredged sediments
 - *Outline of approach*
 - *Review of existing information and preliminary documentation of sediment contamination*
 - *Data generation*
 - *Sampling and analysis plan*
 - *Number of samples or cores required*
 - *Sampling techniques for sediments (chemical and physical)*
 - *Sampling techniques for water (chemical)*
 - *Sample handling*
 - *Quantity of sample required for analysis*
 - *Sample documentation*
 - *Metals and other inorganic substances*
 - *Organics*
 - *Detection limits*

Flowchart for assessment of contamination status of sediments to be dredged



Stage 1- Review of existing information and preliminary Documentation of Sediment Contamination

The collection and review of existing data on the sediments to be dredged allows an initial assessment of whether additional data is required. The levels of fewer contaminants may need to be measured, or the project may be exempt from further contaminant testing.

- Review data from previous studies
- Compile a synopsis of dredging-site history, including (knowledge of past contamination and distribution and concentration of contaminants
- Assessment of homogeneity of sediments. Reduced sampling effort may be justified where sediments are well mixed by frequent dredging (every one to two years), high currents, wave action or shipping traffic.
- Identification of contaminants
- Survey of the marine biota from the dredge and disposal site
- Appropriate control measures

Stage 2 - Data Generation

Sampling and analysis plan should be prepared prior to commencement of fieldwork.

- Outline of dredging proposal (basic details like site, depth, dredging type, sediment type, final amount of material etc.)
- Maps (dredge and disposal site
- Contaminants to be measured and sampling sites depending on history and environmental factors (currents etc.) that may affect the distribution of contaminants
- Chemical analyses of sediment
- Metals and other inorganic substances
- Organics
- Quality assurance and quality control
- Assessment against sediment and water quality guidelines
- Biological testing and monitoring
- Ecotoxicology and bio-accumulation

NOTE: Should assessments comply with EHS requirements, proponent can proceed with the application for EHS NOC to allow conduct of Dredging and Reclamation Activity.

- Assessment against sediment and water quality guidelines
 - *Sediments (spoil ground stability)*
 - *Water Quality*
- Biological Testing and monitoring
 - *Ecotoxicology and bio-accumulation*
- Effects of contaminated sediments

- *Support policies that reduce discharge of toxicants in catchments and exotic species in coastal waters*
- *Biological contamination by exotic species*
- *Assess contamination of sediment to be dredged*
- *Document history of site where contamination is suspected*
- *Develop sediment sampling plan to adequately characterize sediments*
- *Measure levels of contaminants of concern at site*
- *Compare contaminant levels with guideline values*
- *Assess risk of translocation of exotic species in spoil*
- *Assess risk of new introductions of exotic species by dredges*

1.5.2 Monitoring

- Establish appropriate two timescale monitoring program;
 - *Operational monitoring during dredging projects is required to ensure that turbidity, for example, does not become excessive so that an immediate operational change to dredging methods, and so forth, is required. This monitoring activity is part of the environmental improvement plan.*
 - *Long term monitoring to improve future dredging by better assessment of impact.*
- Monitoring of possible biological effects of activity particularly contaminated sediments on spoil grounds
- Monitor release of contaminants
- Monitor nutrients and algal blooms
- Monitor turbidity and seagrass and other marine species' health

1.5.3 Environmental Management

- Monitor impacts
- Assess impacts
- Look at ways to reduce impact
- Implement strategies to reduce impacts

1.5.4 Dredging and Reclamation Design

Dredging activity should follow a design that intends to minimize need for dredging or at least maximize utilization of spoil as a control to minimize possible environmental impacts. Design requirements also apply to reclamation activities and islands to be established not to impact the environment (e.g. direct/re-align channels and islands towards best orientation that would minimize future dredging requirements).

1.5.5 Pollution Control (Water, noise, air, groundwater etc.)

- Control of possible noise, air, groundwater pollution from sources such as equipment etc.
- Conduct information and feedback mechanisms with the local community to identify noise, air pollution issues (e.g. inform community about possible odor and grey sediment caused by dredging)
- Alter or enclose equipment to reduce noise and air emission at source including use of sound-absorbing materials to prevent the spread of noise by isolating the source
- Limit times of operation
- Use of environmentally friendly lubricants for dredging equipments.

PART TWO:

2. EHS No Objection Certificate to Allow Conduct of Dredging and Reclamation Activity

2.1 Application process

This particular guideline presents the authority of EHS to grant NOC for activities related to dredging, spoil disposal, reclamation activities within EHS jurisdiction. This document also discuss the compliance of a clearance grantee on basic requirements for mandatory requirements related to the activity and other requirements which include, but are not limited to, *1. Evaluation and studies; 2.) Monitoring; 3.) Environmental Management; 4.) Design; and 5.) Pollution Control.*

Approval and issuance of certificate shall be processed up to a maximum of five (5) working days after the review process, field validation / inspection and other procedures of EHS. Issuance of clearance will be after the proponent's acceptance of the conditions and payment of tariffs assigned by EHS based on its standard tariff rates.

Dredging, spoil disposal, and reclamation projects within the coverage of the EHS mandate should apply for EHS NOC before commencing with activities and related work.

2.1.2 Application Attachments

a. Basic information

- *Scale/size of proposed activity*
- *Justifications for the project*

b. Baseline Reports

- *Site selection (dredge, disposal, reclamation areas)*
- *Biological environment (flora and fauna)*
- *Sampling, Laboratory testing, modeling etc.*

c. Detailed plans (dredging, disposal and reclamation)

d. Monitoring Plan

e. Environmental Management Plan

f. Pollution Control

g. Photographs during baseline or any other relevant studies

h. Manpower

i. Equipment

j. Transportation Plan / Facilities

k. Maintenance and care plan

l. Location Maps

m. Public consultations/acceptance evidence

n. Others as needed

2.2. Reporting

A baseline environmental study report conducted by a third party accredited by EHS should be submitted to this Authority with the application form prior to the commencement of dredging project. The document will be used as basis for approval and as benchmark to measure developments of the project later.

Three (3)-month progress report should be submitted to EHS to provide updates on the development of the project. Spot inspections will also be conducted to check if conditions set and implementation of project design are being implemented and followed by the proponent.

Post-activity monitoring reports should be submitted to EHS within 2 weeks after the completion of dredging, disposal and/or reclamation project. The results of the post-dredging, disposal and reclamation will be reviewed in reference to the baseline survey results and findings of the condition of surrounding environment.

Progress reports should be submitted to EHS for updating purposes and inclusion in documentation such as scientific journals, presentations etc.

2.3. Safety of Records

All baseline study, periodic reports, photo documentation and back-up files of conducted progress monitoring should be in the active file of the proponent for an indefinite timeframe. This is to assure that records will be available to justify post-activity status of dredged, disposal and reclaimed areas that may result to adverse environmental impacts caused by other activities later on.

Files should be readily available and retrievable at all times and open for accessing by the Authority within a seven (7) year period.

3. Administration and Enforcement

3.1 Regulatory body

This guideline shall be administered and enforced by the Environment, Health and Safety (EHS) through its Marine Environment and Wildlife Section given the mandate to develop and implement guideline/regulations for activities which would have direct or indirect impacts to the environment, particularly the marine environment and wildlife covered by this particular guideline.

This Authority reserves the right to stop activities, seize, revoke license/permit/clearance, and penalize any activity, which are operating not in compliance with any section of this guideline and other relevant regulation and the terms and conditions set by EHS in the certification.

3.2 Administration

3.2.1 *Access and inspection of records / property:* To ensure effective administration, each regulated activity shall, during business hours, allow EHS officials to:

- enter its place of business
- examine records required
- make copies of the records
- inspect and photograph the facilities, property and animals as the officials consider necessary
- document by photographs and other means, conditions and areas of non-compliance.

3.2.2 *Facilities:* The use of a room, table, or other facilities necessary for the proper examination of the records and inspection of the property or animals shall be extended to officials by the regulated entity.