

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) GUIDANCE DOCUMENT

FOR SAND MINING / DREDGING ACTIVITIES

INTRODUCTION

1. This document is prepared to assist project proponent and environmental consultants in preparing the Environmental Impact Assessment (EIA) Report for any proposed sand mining/dredging activities. It is also intended to ensure proper planning and implementation of sand mining/dredging activities in a sustainable manner, thus minimizing the potential negative impact to the environment, arising from such activities.

2. The potential impacts generated from sand mining/dredging are shifts in current patterns, accompanying sand removal, for instance, may carry sediment and nutrient loads where they can potentially impact on important habitats and ecosystems.

POLICY AND LEGAL REQUIREMENTS

3. The following lists are the policy and legal requirements that need to be referred to when preparing the EIA Report:

- National Physical Plan, April 2005;
- National Mineral Policy,
- Environmental Quality Act, 1974;
- Environmental Quality Order (Prescribed Activities) (Environmental Impacts Assessment) 1987;
- Environmental Quality (Scheduled Wastes) Regulations 1989
- Fisheries Act 1985.
- Continental Shelf Act 1966.
- Exclusive Economic Zone Act 1984.
- Merchant Shipping (Oil Pollution) Act 1994.

4. This document is also proposed to complement other guidance given in the following guidelines where terms and procedures are defined, among others:-

- A Handbook of Environmental Impact Assessment Guidelines;
- Environmental Impact Assessment Guidelines for Coastal and Land Reclamation Activities;
- Guidelines on Erosion Control for Development Projects in the Coastal Zones 1/97; and
- Guidelines for Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation, December 2001;

SCOPE OF EIA STUDY

Executive Summary

5. The preparation of the Executive Summary is a critical part of the report, because it is the part that will be reviewed critically by the project approving authority. The Executive Summary should be brief and concise and written in Bahasa Malaysia and English.

Title of Project

6. The project title should identify the type of project proposed and the specific location. The title should also indicate if the project is part of a larger proposal.

Project Initiator and Registered EIA Consultant

7. A clear statement is required as to which public or private organization has initiated the project. It should also make quite clear the organization and the individual (the assessor) to whom any inquiries should be directed.

8. The names of the Department of Environment's registered EIA individuals or consulting firms that carried out the EIA should be given. The EIA consultant has to list down the names, academic/ experience backgrounds and the area of study of each individuals involved in the EIA study, followed by their signatures. The EIA consultant team is to be lead by a Team/Project leader/ manager who is responsible for the EIA report.

Statement of Need

9. The statement of need for a project should be clearly established early in the project planning. The basis and rationale for the proposal would reflect the objective of a project and provide direction during planning. A statement of need also highlights the various benefits of the proposed project.

Project Description

10. A more detailed description of the project concept, with technical data available should be given, in terms of:

(i) Project Location

- Exact location of proposed sand mining/ borrow area with clear coordinates.
- Distance from the proposed sand mining/ borrow areas to the nearest shoreline;
- Size of the proposed sand mining/ borrow area;
- Existing land use and constraints;
- Macro scale maps (1:50,000 & 1:25,000), plans, photographs or satellite images, clearly identifying the location of the proposed sand mining/ borrow area;
- Other nearest sand mining/ borrow areas;

(ii) Project Concept/ Development

- Sediment/ soil investigation study – The results of investigation will provide the basis for assessing the availability and suitability of the dredged materials in the proposed sand mining/ borrow area, in terms of:
 - Particle/ grain size;
 - Carbonate content;

- Organic content; and
- Mineral content.
- Types of sand dredger and equipment used for sand mining activity, including transportation of sand.
- Estimated volume of sand to be dredged/ mined.

(iii) Project Implementation

Proposed project implementation and work schedule.

(iv) Project Activities

- Pre-dredging stage – Bathymetric survey, soil investigation study, baseline environmental data;
- Dredging stage – dredging works and transportation of sand to necessary site, monitoring of environmental components such as water quality; and
- Post-dredging stage - Bathymetric survey and post-monitoring of environmental components such as water quality, for such a period to be determined.

Project Options

11. The project options shall include:

(i) Site Selection Criteria

Sand source options seek to identify suitable location of sand sources and in sufficient to necessary use such as for reclamation.

(ii) Site Mining Technology

The technology applied for sand mining is determined by several factors including the depth at which the source of sand is located, the type and quality of material, the time frame available for mining and reclamation, weather and sea conditions, sea traffic and others.

Existing Environment

12. Clear explanations on existing environment with the methodologies on the sampling of baseline data, on:-

(i) Physical Characteristics

- Surrounding area/ land use
- Bathymetry surveys of Borrow Area
- Soil Investigation of Borrow Area

(ii) Hydraulics/ Hydrodynamic Components

- Existing erosion, sedimentation and accretion areas
- Bathymetric surveys
- Shoreline condition
- Tidal and current patterns
- Wave climate
- Littoral transport
- Geological condition

(iii) Water Quality

- Marine Water Quality Sampling (pH, Dissolved Oxygen, temperature, salinity, Suspended Sediment)
- Results of Water Quality Monitoring
- Comparison with Department of Environment's Data

(iv) Air Quality

- Identification of sources of dust generated which may affect the proposed site.

- Collection of meteorological data which will affect distribution and severity of air quality impacts in particular (heat inversion, dew).
- Monsoon seasons.

(v) Marine Ecosystem

- Macro-benthos resources.
- Fish diversity and density.
- Marine mammalians.
- Coral reefs.

(vi) Landuse

- Identification on whether there are any environmentally sensitive areas (ESAs) that may be affected by the proposed project. The area to be studied (zone of impact) will invariably need to extend beyond the immediate project boundaries as ecological effects can be fairly widespread.
- The landuse map must be clear, readable and in colored form. An updated satellite image to indicate the recent existing environment can be used.

(vii) Socio Economy

- Identify whether there are any commercial fishing grounds, fish breeding areas, marine parks, etc which are located near the proposed project area, that may affect the socio economy to the fishermen and tourism.

(viii) Archaeology and Historical

- Identify historical and archaeology features (ship wrecks) at the proposed site.

(ix) Navigation

- Study on existing shipping routes and vessels navigation traffic.

Potential Significant Impacts

13. Methodologies and results of prediction of impacts on:

(i) Physical system

- Geology and minerals.
- Erosion and sedimentation.
- Climate, air quality and noise
- Micro-climatic change, accelerated sea level rise, littoral transport

(ii) Hydraulics/ Hydrodynamics

- Erosion, sedimentation, accretion
- Hydrodynamic simulations
- Impacts on current flow trends and velocities
- Impacts on the water level
- Changes in bathymetry impacts on sea traffic movement and safety
- Changes in bathymetry
- Impacts on coastal morphology
- Sediment dispersion and sediment transportation
- Changes in wave patterns
- Impacts on long-term shoreline changes

(iii) Hydrology

- River sediment spreading and settlement
- Tidal flushing
- Suspended sediment plume from riverine and other sources.
- Water Quality (Bacterial pollution, BOD, dissolved oxygen, etc.)
- Coastal flooding (considering extreme events)

(iv) Water quality

- Marine water quality.
- Suspended Solids, heavy metals, oil and grease, pH, salinity, Dissolved Oxygen, temperature)
- Wastes (scheduled wastes, solid, effluents and wastewater)

(v) Biological system

- Impacts to sea grass bed.
- Impacts to coral reefs.
- Impacts to mangroves and mudflats.
- Impacts to fisheries.
- Impacts to aquaculture, cage cockles.
- Impacts to marine mammals and turtles.
- Impacts to macro-benthos.

(vi) Navigation

- Proximity to lighthouses.
- Impact to existing sea traffic, routes.

(vii) Archeology

- Impacts to historical and archaeology features (ship wrecks)

(viii) Ports

- Impacts to ports, harbours and prohibited areas.

(ix) Cables and Pipelines

(x) Coastal Processes and Water Depths.

(xi) Socio economic systems

- Livelihood of those who are dependent on the sea resources (fishermen and tourism operators)

Mitigation and Abatement Measures

14. This section considers the proposed mitigation measures and strategies to reduce or prevent adverse impacts on different sectors of the environment. Proposed mitigation must be sustainable, integrated, measurable, achievable and feasible and covers the operation stage.

- Physical Environment
 - Geology and Minerals, Soil Erosion and Sedimentation.
 - Adequately proposed the overall stability.
- Climate, Air Quality and Noise
 - Selection of dredgers/ vessels route.
- Water Quality
 - Selection of sand mining methods as to minimize the disturbance to sea bed morphology and the dispersion of Suspended Solids to adjacent areas.
 - Oil and Grease - no discharges of oily wastewater from sea vehicles engine room directly into sea.
 - Heavy Metals – Analysis of sand source to determine the presence of any toxic constituents.
- Biological System
 - Habitat Damage
 - Types of equipment used for dredging.
 - Ensure minimum seabed disruption and dispersion of sand.
 - Fixing a specific depth of sand dredged
 - Ensure that aquatic food web is not disrupted
 - Benthic, Biology, Habitat and Marine Biodiversity
 - Employment of suitable dredging technique
 - No discharges directly into sea
 - Spillage and fugitive release should be minimised
- Navigation and Safety

- Avoid using busy sea naval routes.
- Use necessary signals approved by the authority when working at nights.
- Socio-Economic System
 - Economy
 - compensatory 'assisted area' package for other employment.
 - improve potential employment benefits, commerce and income for local people.
 - register of local suppliers to help encourage local links.
 - Compensation to those affected
- Archaeology
 - Any monumental remains must be first excavated, studied and relocated in another area.
 - Any work on sites must be stopped if archaeological sites discovered during construction.
 - Efforts must be made to preserve the cultural remains and archaeological sites located outside the development area.
 - Set up markings where cultural remains and archaeological sites are located before they are salvaged or moved.

LIST OF CONSULTANTS/STUDY TEAM

15. A list of registered EIA Consultant team with their relevant qualifications and verification on the competency of the firm engaged to prepare the EIA report. The environmental consultant team should be headed by a project manager, whose ultimate responsibility is to coordinate the inputs of individual specialists and to provide an overview. For EIA Study of Sand Mining, members of the study team should have the following specialization/expertise:

- Soil Erosion
- Hydrology
- Hydrodynamic
- Coastal Hydraulics

- Ecology, fisheries and marine and freshwater biology
- Drainage & Irrigation Expert
- Geology Minerals
- Marine, river and brackish water quality
- Sediment quality
- Climate and weather
- Air quality and noise
- Civil engineering
- Sociology