

2017

# ENVIRONMENTAL IMPACT ASSESSMENT GIUDELINE



Special Economic Zone Authority  
Environmental Affairs Department  
<http://www.duqm.gov.om/>

## Environment Impact Assessment Guideline

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## 1 INTRODUCTION

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The Special Economic Zone Authority Duqm (SEZAD) was established as per the provision of the Royal Decree (RD) 119/2011 and is responsible for the management, regulation, and development of all economic activity in the DSEZ. The Ministry of Environment and Climate Affairs (MECA) is the national environmental regulator for the Sultanate of Oman. Any company/organization establishing industrial activities in the Special Economic Zone (SEZ), Ad Duqm, need the environmental permits as per the requirements of the Ministry of Environment and Climate Affairs (MECA). Per RD 79/2013, the Special Economic Zone Authority Ad Duqm (SEZAD) shall have the functions of the MECA in relation to issuing environmental permits and conditions and all environmental licensing and regulation for the projects and take necessary environmental measures.

This document shall serve as a guideline for the companies for conducting the Environmental Impact Assessment (EIA) report. RD 5/2016 and RD 44/2014 amending RD119/2011, include the site and boundaries of SEZ pertaining to Wilayat Al-Duqm, which shall be under SEZAD's jurisdiction and is as shown in Appendix-A.

### 1.1 DEFINITIONS

Unless contrary intentions appear in these guideline –

- a. *“Guidelines”* means the Environmental Impact Assessment Guideline, 2016 for SEZD
- b. *“Project”* means project concerning establishment of industries and development activities either existing or proposed to be initiated in the SEZD.
- c. *“Proponent”* means the individual or organisation proposing to initiate a project.
- d. *“Screening”* means action undertaken to determine whether or not environmental impact assessment is necessary.

### 1.2 OBJECTIVES OF THE GUIDELINE

The objective of this guideline are as follows -

1. Assist in the assessment of likely environmental impacts from the implementation of the project;
2. Identify, assesses and specify methods, measures and standards, technologies to be included in the detailed design, construction and operation of the proposed developments which are necessary to mitigate these environmental impacts and reducing them to acceptable levels;
3. Design and specify environmental monitoring and audit requirements, to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted;
4. Facilitate to integrate environmental consideration into the Project planning cycle;
5. Help decision makers in determining whether the project may be implemented or not from an environmental perspective.

### 1.3 GENERAL REQUIREMENTS

The environmental requirements, given below, are generic and applicable to all companies and industries in the Port of Duqm and the Special Economic Zone (SEZ). Compliance with this Guidance Note shall be a condition in the environmental permit.

1. SEZAD shall have the sole authority of issuing environmental permits and applicable licenses and taking the necessary action for the protection of the environment, the prevention of pollution and protection of potable water resources from pollution pursuant to the laws in force;
2. SEZAD shall have jurisdiction for areas (onshore and offshore) within the SEZ boundaries provided in RD 5/2016;
3. All companies conducting EIA studies must be registered and licensed with MECA;
4. The development of any project must be in conformity with the Omani Regulations/Ministerial Decisions outlined by the Government of Oman and SEZAD guidelines;
5. The Operator shall adopt and implement the IPPC Best Available Techniques (BAT) approach as a governing principle for the project design and environmental management;
6. The findings and recommendations of the EIA effort should be documented clearly and concisely in the report and any necessary technical details should be provided, especially those regarding baseline data;
7. The EIA report which shall also include the EMP for all phases of development of the project shall serve as a guidance for the Owners/Contractors;
8. SEZAD can modify any conditions in an environmental permit at any time when required by changes in Omani legislation or Best Available Techniques (BAT) or from results of environmental performance.

## 2 ENVIRONMENTAL PERMITTING PROCESS

For SEZ area, SEZAD will assess the activities and formulate requirements for the environmental permit and this process shall have the following phases and as shown in Figure 2-1.

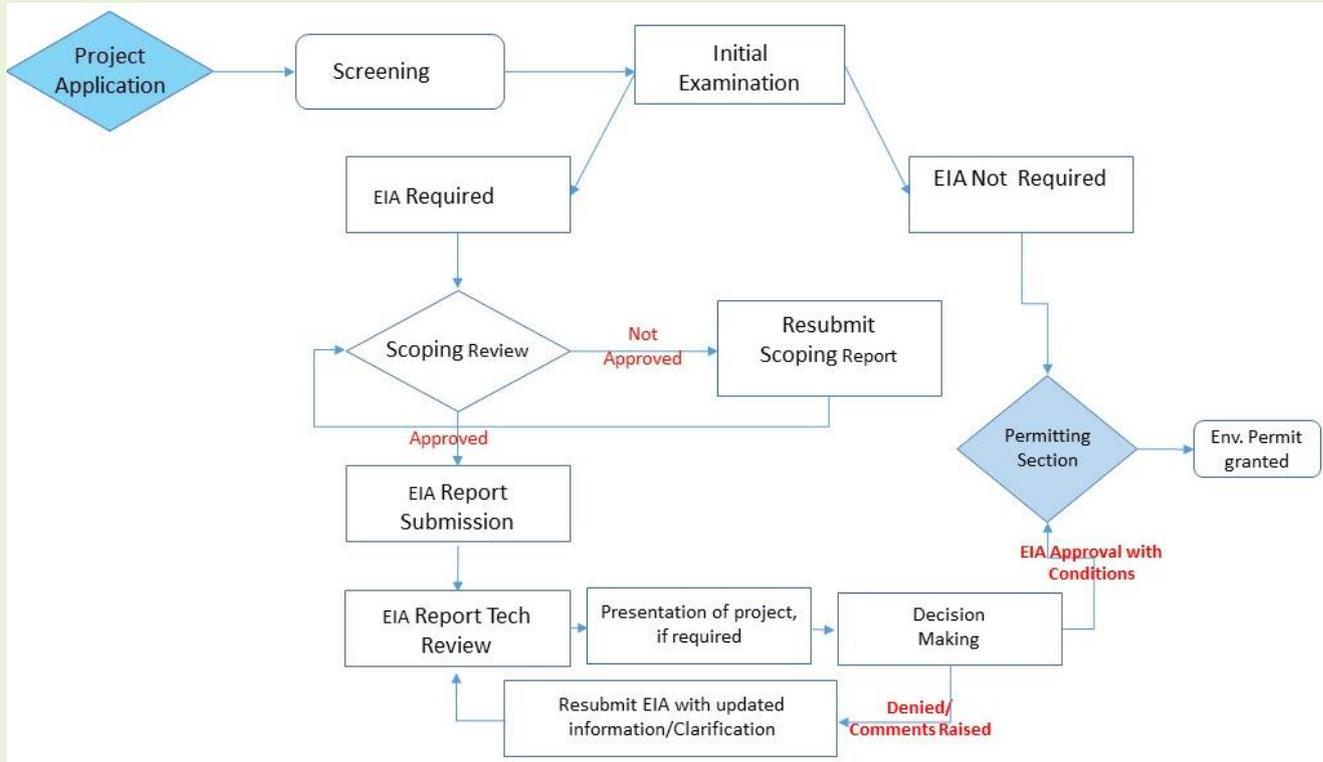


Figure 2-1: Phases of EIA process

### 2.1 PROJECT SCREENING

The first task is to determine whether an Environmental Impact Assessment will need to be prepared. This is often referred to as 'screening'. This guidance note, includes certain classes of projects which indicate that an EIA must be prepared. However, it is important to note that SEZAD can also require an EIA for a project not included in the list of projects requiring EIA. This usually arises where there is a likelihood of significant effects on the environment by reference to the nature or location of a project e.g. potential impact on a designated conservation site or sensitive environments.

On receiving notification of the intention to make a development SEZAD shall make a decision on whether EIA is required. On completing the screening exercise, SEZAD shall provide a screening opinion, indicating whether a detailed assessment is required or not. SEZAD Decision No 326/2015 lists the project which requires detailed EIA study. In addition, Appendix-B of this guideline gives an illustrative list of projects which require detailed EIA study.

The screening process shall divide the project proposals into the following main categories –

1. Project which require an EIA; and
2. Project which do not require a detailed EIA

If detailed EIA is required, the project shall first provide a Scoping and Assessment Review as step 1 of the EIA and permit process.

3. Scoping and Assessment to identify the topics and methodologies that need to be studied in the EIA (the Terms of Reference for the EIA).

SEZAD shall then carry out: -

1. Reviewing, assessment of the EIA and identification of lack of information or further requirements
2. Permitting, setting the conditions for the environmental permit.

For companies which do not require a detailed EIA study, the Proponent can apply for the environmental permit through the One Stop Shop Department of SEZAD along with all the documents as required by SEZAD. The Proponent depending on project type might be required to submit an Environmental Management Plan.

For SEZ Duqm an extensive baseline study has been established by various consultants from 2010 through 2014. However, the availability of this baseline does not relax the requirements for conducting baseline study during EIA for individual companies that are established in the SEZ.

SEZAD will issue environmental permit conditions based on Omani legislation and Omani legislation and the European Directive on Integrated Pollution Prevention and Control (IPPC) and Best Available Techniques (BAT) documentation. The permit conditions will be specific for each company taking into consideration BAT in order to limit and manage the impact of the key environmental issues.

## **2.2 EIA STUDY**

EIA is a tool used to assess the environmental consequence of proposed development projects, programmes and policies and propose relevant management actions to mitigate any adverse risk. EIA identifies not only adverse consequences but also positive effects of a development activity and identify ways of enhancing them further. The goal is to produce good decisions about whether or not a project should proceed, and if so, under what conditions.

Thus the objective of an EIA is to ensure that potential problems are foreseen and addressed for all aspects of the projects. The objectives of EIA are to

- a) Improve the environmental design of the project
- b) Ensure efficient use of resources
- c) enhance social aspects
- d) identify key impacts and measures for mitigating them
- e) avoid serious and irreversible damage to the environment

The study therefore requires a multi-disciplinary approach. The study shall:

1. Identify sources of impact of the project activities, both during construction and operational stages, on the various environmental components;
2. Predict the impacts using quantitative and qualitative methods;
3. Recommend an environmental management plan to reduce adverse impacts and enhance positive contribution of the project;
4. Present the result of Impact identification, prediction and assessment with suggested mitigative measures;

5. Set basis for continuous monitoring of key project activities.

### 3 SCOPING STUDY

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Scoping determines the content, extent of the matters which should be covered and the methodology followed in the environmental information to be submitted to SEZAD for projects prior to EIA. Scoping shall be undertaken by the developer's EIA Team. SEZAD shall issue a Scoping Feedback/Comment, to the developer on the scoping report, which shall form the terms of reference for the comprehensive EIA.

#### 3.1 SCOPING REPORT

Scoping report shall primarily focus on identifying the impacts to be assessed and which of these are most important, and shall also address the following matters:

- The project details and schedule;
- The baseline studies which are required to characterise the existing environment including any special requirements for baseline studies regarding their geographical extent or timing e.g. because of seasonal changes in fauna and flora;
- The level of detail of investigations required;
- Methods to be used in EIA to predict the magnitude of environmental effects;
- The criteria against which the significance of effects shall be evaluated;
- Types of mitigation to be considered;
- Consultations that has to be carried out during the environmental studies; and
- The structure, content and length of the environmental study/report.

The table of content for the scoping report is presented in 3.1.1 to 3.1.7.

##### 3.1.1 Introduction

A brief summary of the key points which presents only the main conclusions and options for decision-making. Further name and contact details of the Developer/Operator and the Consultant should be included.

##### 3.1.2 Applicable Environmental Regulations (Omani and International)

Any relevant policy, legal, planning and administrative frameworks. These might include what laws and regulations apply, whether the location is zoned for the proposed development and what local and national Government bodies, and municipalities/authorities are involved in approving and operating the proposed development.

In areas where the Omani regulations are not available various international standards and guidelines may be applicable.

##### 3.1.3 Description of Project

A brief summary description of the development, its purpose, scale, design, schedule for construction and implementation, expected raw materials, utilities, manpower, products and by-products from the project construction and operational phase. A plan showing the boundary of the development including any land required temporarily during construction should also be included.

### **3.1.4 Baseline Environmental Setting**

A brief description of the surrounding location and the environment likely to be affected by the proposed project sourced from either primary or secondary data. This will serve as benchmark against which the environmental changes shall be measured in future and the potential impacts assessed.

The baseline chapter shall also provide details on the baseline surveys to be undertaken during the EIA stage. This section shall include the below minimum information at a minimum:

- Exact locations and numbers to be monitored for all surveys;
- Details on monitoring methods and durations of sampling;
- Maps identifying baseline monitoring;
- List of desk based research data and publications that will be used to provide baseline information; and
- Modelling details, if relevant or required

If baseline survey is not envisaged for any particular component, justification for the same should be included in the report.

### **3.1.5 Environmental Releases, Impact Identification and Mitigation Measures**

A description and evaluation of the potential impacts on the environment and any uncertainties, data gaps or assumptions involved during construction and operation phase. Data sources and information used in the identification and evaluation process should be referenced. Reference to mitigation and compensation measures should be included but detailed descriptions of mitigation and monitoring measures and arrangements for their implementation shall be included in the EIA report.

### **3.1.6 EIA Methodology**

Tabulate or briefly explain the subsequent EIA approach and methods used to monitor, identify, predict and assess impacts and the list of data sources.

### **3.1.7 Conclusion**

The important conclusions regarding potential environmental effects, mitigation, uncertainties and the proposed methodology for the Project shall be included in this section.

## 4 EIA REPORT

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The EIA report should contain a brief introduction explaining the need for and context of the project. This document should have the following content, unless specified otherwise in the Terms of Reference and should be concise:

- Executive Summary
- Legal Framework
- Description of the Project
- Description of the site and environment – Baseline Study
- Significant Environmental Releases
- Identification and Analysis of Alternatives
- Analysis of Best Available Techniques
- Climate Affairs – Mitigation and Adaptation (as per MECA requirement)
- Impact Identification and Assessment
- Environmental and Social Management Plan
- List of References
- Appendices including
  - Reference documents, photographs, unpublished data
  - Calculations, details of air/water/noise quality modelling done, if any
  - Risk Analysis report, if applicable
  - Consulting team composition
  - Notes of Public Consultation sessions

### 4.1 EXECUTIVE SUMMARY

The Executive Summary should summarize the significant findings of the EIA report and the study's conclusions. It must include a short description of the proposed project, a brief summary of the key findings of the baseline characterization, generation rates and characteristics of waste streams, a brief summary of the most critical environmental aspects, nature and magnitude of the most significant impacts and a brief description of how significant environmental issues will be resolved as well as the appropriateness of the approach to resolve it.

The information should be condensed into concise, but meaningful and should make use of base maps, tables, and figures, whenever possible. An Arabic translation of the executive summary must be included in the final EIA Report.

### 4.2 LEGISLATIVE FRAMEWORK

Where applicable the information considered under this section should include all statutory designations such as national nature reserves, sites of special scientific interest, areas of outstanding beauty etc. It should include references to all relevant Regulations/Royal Decrees/Ministerial Decisions, and local and national planning policies applicable to the project, site and surrounding area.

For areas where Omani regulations are not available, applicable international regulations/guidelines may be referred to, specific to the industry/project.

### **4.3 PROJECT DETAILS AND DESCRIPTION**

The purpose and physical characteristics of the project, including details of proposed access and transport arrangements and numbers to be employed and where they will come from. A suggestive list for this section is given below:

- Description of the production processes and operational features of the project;
- Location and project layout plans, maps, diagrams and photographs showing boundary of the project including any land requirement during construction;
- Infrastructure and utilities including raw materials, fuels, chemicals to be used, their quantities, arrangement for transport, storage and handling;
- Products and by-products, quantity, storage, handling and transport;
- Requirement and details of utilities within the project site and their capacities viz boilers, furnaces, desalination plant, workshop, laboratories, treatment plant, power plant, incinerators, pipeline network, storm water network, drainage network etc, as applicable;
- Construction methods and resources used in construction and operation (materials, waster, energy, etc.);
- The relationship with other existing/planned projects;
- Other activities which may be required as a consequence of the project (eg new roads, extraction of aggregate, provision of new water supply, generation or transmission of power and sewage disposal)

### **4.4 PROJECT ALTERNATIVES**

A systematic comparison of the proposed investment design, site, technology and operational alternatives in terms of potential impacts, suitability under the local conditions, monitoring requirements etc shall be included in the EIA. The analysis may lead to designs that are sounder from an environmental, socio-cultural or economic point of view than the original plant design. The EIA shall also include a "no action" alternative i.e. not constructing the project in order to demonstrate environmental condition without it. For example, if the project were to be sited elsewhere, the impacts associated should be reviewed and the associated mitigation action and costs defined. Include the following:

- a) An analysis of the alternative means of carrying out the Project, including need for the project, alternate projects and scope of the project (major components included and excluded). For the project components, include a comparison of their environmental and technical performance potential and other relevant variables;
- b) Rationale for the decisions made by the Owner about project component alternatives including how environmental, socioeconomic, community information and project design. Discuss the status of any ongoing analyses, including a discussion of the options not chosen and the rationale for their exclusion;
- c) Contingency plans if major project components or methods prove infeasible or do not perform as expected; and
- d) An analysis of the "no action" alternative. The no project alternative will be considered as the baseline against which the environmental effects of the project should be considered.

- e) Assessment of management of waste stream as per Integrated Pollution Prevention and Control (IPPC) Best Available Techniques (BAT) requirements.

## 4.5 SITE DESCRIPTION AND ENVIRONMENTAL SETTING

The EIA must be a site specific and project specific study. An EIA for a particular development in a particular setting cannot be transferred either to another development or even the same development in another setting. The EIA is a multi-disciplinary study that must span the relevant aspects of the natural and built environments. Critical areas to be studied will be dependent on the project site and the project details.

This description of the environmental setting is a record of conditions prior to implementation of the proposed project. It is primarily a benchmark against which the environmental changes shall be measured in future and the potential impacts assessed. The environmental setting of an area may be sourced from both primary and secondary surveys/data.

### 4.5.1 Baseline Data Gathering

Data Collection and interpretation should involve a combination of desktop research and field reconnaissance and investigation and structured interviews. The existing sources of information may include

- Databases
- Reports
- Experts from government organization
- Previously developed EIA's for the area
- Local Community
- Aerial Photos and Satellite Imagery

Primary information can be acquired through

- Fieldwork which include surveys, boreholes, photography etc
- Interviews
- Monitoring

Each of the realms of environmental data should be investigated, viz. physical, biological and human, and the relevant aspects included in the study.

#### 4.5.1.1 Physical Environment

Several aspects of the physical environment must be considered during the baseline data gathering. The presentation of the information in the EIA report may follow the basic sequence below, as applicable to the project:

- Climate, including the relevant meteorological considerations
- Topography and Landscape;
- Geology/Geomorphology including soil quality, hazard potential. Companies in SEZ, as required, shall conduct a Zero Assessment Baseline Survey (soil and groundwater) and an End Survey, for the beginning and end of a tenant's lease period, respectively.
  - The zero survey report has to give a very clear description of the soil quality at the beginning of the tenancy period and shall serve as the reference quality for the plot.

- If the End survey indicates new or increased contamination of soil (ground or groundwater) the tenant shall be liable to propose and carry out a mutual agreed plan to remediate the contamination to the level of the zero survey.

- Hydrology and Hydrogeology including surface drainage pattern, groundwater quality, location of wells, wadis, etc;
- Coastal Morphology;
- Marine water and Sediment Quality;
- Air quality including dust and noise and odour

Air Quality monitoring shall be done using CAAQMS station. Diffusion tubes shall not be used unless approved by SEZAD. Air quality monitoring shall include PM<sub>2.5</sub> along with PM<sub>10</sub> measurements.

#### **4.5.1.2 Biological Environment**

The biological environment includes several inter-related components, which are based on the physical supporting structure. The baseline status of the flora and fauna, rare or endangered species, sensitive habitats etc. in and around the study area shall be properly determined. This should include the terrestrial and aquatic ecosystems. Further, if there exists any wetland or marine areas within the study region, the ecosystems of the said region shall also be studied for ascertaining the baseline condition.

Whenever secondary data is used, it is necessary to quote the source and time of data generation. The information should include the present status of flora and fauna covering all the types of ecosystems in the project area.

#### **4.5.1.3 Socio-Economic Environment**

Aspects of the socio-economic environment will be determined by the physical and biological environments, and the information may be presented according to the following sequence:

- Population and Demographics
- Land and Livelihood /Employment
- Settlement patterns and Social structure
- Services –including health, educational, recreational, waste management facilities available
- Natural Hazard Vulnerability and History
- Recreational activity
- Archaeological heritage
- Cultural values

**For any proposed project site, any findings of archaeological importance shall be intimated to SEZAD and required permission obtained.**

#### **4.5.1.4 Public Consultation**

Describe and document the public consultation program implemented within the EIA Study Area(s), as required. Record any concerns or suggestions made by the public and demonstrate how these concerns have been addressed, or responded to. Discuss:

- how the concerns and issues identified by stakeholders influenced the project development, design, impact mitigation and monitoring, or how it was addressed or discounted;
- the type of information provided and the issues discussed, including those that have been resolved and those that remain outstanding;

- in consideration of unresolved issues, the key alternatives that have been identified by the Owner and stakeholders for future consultations as well as mechanisms and timelines for that resolution;
- plans to maintain and support the public consultation process following completion of the EIA review; and
- Any agreements reached with Owner and stakeholder regarding the Project operations and activities.

## 4.6 PROJECT RELEASES

This chapter shall provide an inventory of expected residues and emissions by type, quantity, composition from the project construction, operational and decommissioning activities, as applicable. The environmental releases will typically comprise of the following, depending on the type of projects –

- Discharges to water;
- Process and domestic wastewater;
- Deposits/residues to land and soil.
- Emissions to air from stationary point sources, mobile sources, area sources etc;
- Noise -day and night during construction and operation;
- Vibration.

The methods of transportation, handling and storage of raw materials, chemicals, fuels and final products, details of generation, handling, storage, management and disposal of toxic and hazardous wastes and details of types, handling and disposal of radioactive materials shall be identified and included in the chapter, as applicable, to the project.

### 4.6.1 Solid Hazardous and Non-Hazardous Waste

SEZAD is developing an Integrated Solid Waste Management (ISWM) system, in coordination with Be'ah (Oman Environmental Services Holding Company S.A.O.C), covering the waste management activities in Duqm to reduce adverse impacts to the environment and health of nearby communities. For any projects proposed in SEZAD, the Proponent shall identify the various types of hazardous and non-hazardous waste expected during the project phases. Based on this an agreement between the project Proponent and be'ah which agrees to accept the waste shall be included in either the EIA report or submitted to SEZAD prior to commissioning of facility.

For waste not accepted by be'ah as per the agreement submitted to SEZAD, the Company shall provide temporary on-site facility and subsequent treatment/disposal/storage method shall be proposed and submitted to SEZAD, prior to commissioning of the Project, as per MD 18/93 and MD 56/2002. The Company shall be responsible for transport and disposal, of the waste, in the be'ah facility, once it becomes operational.

## 4.7 IDENTIFICATION AND ASSESSMENT OF IMPACTS

The assessment of the environmental impact of a development is the main focus of the EIA and therefore the methods used to predict and evaluate the impact are critical to the credibility of the EIA. The assessments should therefore be set out in a clear and structured manner in order to clarify how judgments have been reached. The extent and quality of available data, key data gaps and uncertainties shall also be addressed.

The assessment stage of the EIA should follow a clear progression from the characterisation of the impacts to the assessment of the significance of the effect. It is important that a consistent approach to terminology is

used as confusion often occurs over the difference between impact and effect. The use of the terms should be explained clearly within the report. This Chapter should include the following:

1. List or tabulation and description of environmental aspects;
2. The impact assessment matrix used for assessing the effects.
3. Assessment and criteria for determining the significance of environmental impacts/issues.
4. Discussion of residual, unavoidable and cumulative impacts, (where relevant and appropriate).
5. Tabulation of Significant Environmental Impacts/Issues.
6. Conclusions of modelling done (where necessary) to forecast the nature and extent of the identified environmental impacts.

All prediction techniques, by their nature, involve some degree of uncertainty. The data used to estimate the magnitude of the main impacts should be clearly described in the assessment and any gaps in the required data identified. Where possible, estimates of effects should be recorded in measurable quantities with ranges and/or confidence limits defined. Qualitative descriptions, where necessary, should be appropriately defined.

After predicting the extent of impact, it should be determined whether the changes are significant enough to warrant mitigation measures. This may be evaluated based on the following considerations, at a minimum,

1. Comparison with SEZAD requirement, if any
2. Comparison with Omani and international laws and regulations
3. Reference to pre-set criteria like protected sites, features, species etc
4. Acceptability to local community
5. Severity of impact (reversible, irreversible)
6. Prevalence of Impact (extent of impact) –
  - Duration and frequency of the activity causing the impact
  - Risk (probability of environmental impacts)
  - Importance/Impact (Local, regional, national)

The possible evaluation using the above criteria may be -

- No Adverse Impact
- No significant/Slight Impact- local slight environmental damage contained within the premises with no lasting impact.
- Significant / Major Impact - Severe and/or persistent environmental damage that will require extensive measures to restore uses of the contaminated environment and that will lead to loss of commercial, recreational use, and/or loss of natural resources over a wide area

Depending on the evaluation, the EIA study should proceed to seek solution for preventing or reducing the impacts to ALARP levels in the EMP for the project.

#### **4.7.1 Cumulative Impacts**

Cumulative impacts can occur either when different impacts from one development interact to exacerbate effects on sensitive receptors, or when the magnitude of an impact of a development is augmented or

exacerbated by impacts from other existing or future neighbouring developments, thus creating a more significant impact, on a receptor. The main issues to be considered while compiling cumulative impacts are -

- Impacts from proposed development with those from planned or reasonably foreseeable other developments, for example, proposed development of road, other projects together with traffic could cause adverse congestion, noise and air quality impacts.
- Cumulative impacts of particular concern and which should be addressed within the EIA include:
  - Construction and operational phase impacts, particularly air quality, dust and noise.
  - Traffic and Transport impacts
  - Impacts on health and safety.

Potential impacts identified for each relevant environmental topic during scoping should be assessed for their cumulative effect when combined with other potential impacts. A list of cumulative developments should include those already operational within the SEZ or under construction, and those known to be likely to be subject to application within the foreseeable future. A qualitative judgement shall be made as to the nature, magnitude and significance of the impacts and mitigation proposed to reduce any adverse impacts identified.

#### **4.7.2 Modelling Studies**

All the impacts identified shall be substantiated by a modelling study, as required by the project or as per SEZAD condition. For each model used in the assessment scenarios, the following at a minimum shall be provided:

- justification for the model used;
- discussion of the calibration process for the model, including the limitations associated with using the model;
- a list of all parameters incorporated in the model with a brief description of their purpose, known range of values, whether set from literature, calibrated, or measured (derived from local data) and the value(s) used in the EIA predictions.

#### **4.8 CLIMATE AFFAIRS**

The Directorate General of Climate Affairs, Ministry of Environment & Climate Affairs (MECA) has commenced a chapter on Climate Affairs to address the Climate Change and protection of Ozone Layer issues in the Environmental Impact Assessment (EIA) Studies for industries and infrastructure projects since year 2008. A project requiring EIA is vulnerable to a changing climate, as are the communities and environment it poses a risk to. EIA should therefore consider the potential resilience, both to the anticipated negative impacts and positive opportunities of climate change.

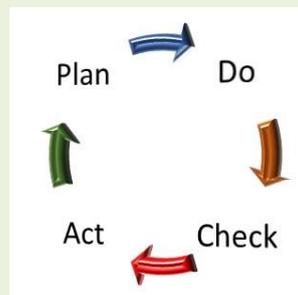
The MECA guidelines requires that EIA study identify, describe and assess the direct and indirect effects of a project on the interaction between human beings, fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage.

The vulnerability of a project to change in climate shall also be qualitatively assessed using the vulnerability matrix provided by the DGCA in its guideline. Measures and approaches for mitigating and adapting the project design and associated facilities to climate change will also be discussed in the chapter

#### 4.9 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Prediction of the potential adverse environmental and social impacts and developing measures to eliminate, offset, or reduce impacts to acceptable levels during implementation and operation of projects form the essential parts of an EIA. It is recognised that it is seldom possible to eliminate an adverse environmental impact altogether, but it is often feasible to reduce its intensity. This reduction is referred to as mitigation.

EMP may be defined as a plan or program that mitigate activities, which have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored during the commissioning, mobilization, construction, operation, maintenance and decommissioning of a project. EMPs thus provide an essential link between the impacts predicted and mitigation measures specified within the EIA report, and implementation and operational activities. The EMP shall hence follows the PDCA cycle throughout the project phase and integrate in into the project cycle.



- Plan - Planning, including identifying environmental impacts and establishing environmental goals.
- Do - Implementing, including employee training and establishing operational controls.
- Check - Checking, including auditing, monitoring and taking corrective action.
- Act - Reviewing, including progress reviews and taking action to make needed changes.

The management plan should thus include the following, as applicable;

1. All the measures that have been incorporated into the project design to reduce or to eliminate significant potential environment impacts identified during all phases of the project.
2. All possible contingencies, their impacts, mitigation measures, contingency plans;
3. Organizational structure of the Environmental Management team or office, administrative arrangements and staffing requirements;
4. Risk Assessment and Management, as applicable - Should include details on likelihood and possible effects of hazards associated with accidental release to the environment of hazardous materials, natural disasters (dam bursts, earthquakes, explosions, tank collapses, etc) or of site hazards, arrangements for the keeping, storing and use of hazardous substances;
5. Environmental Monitoring and auditing plan for all project stages

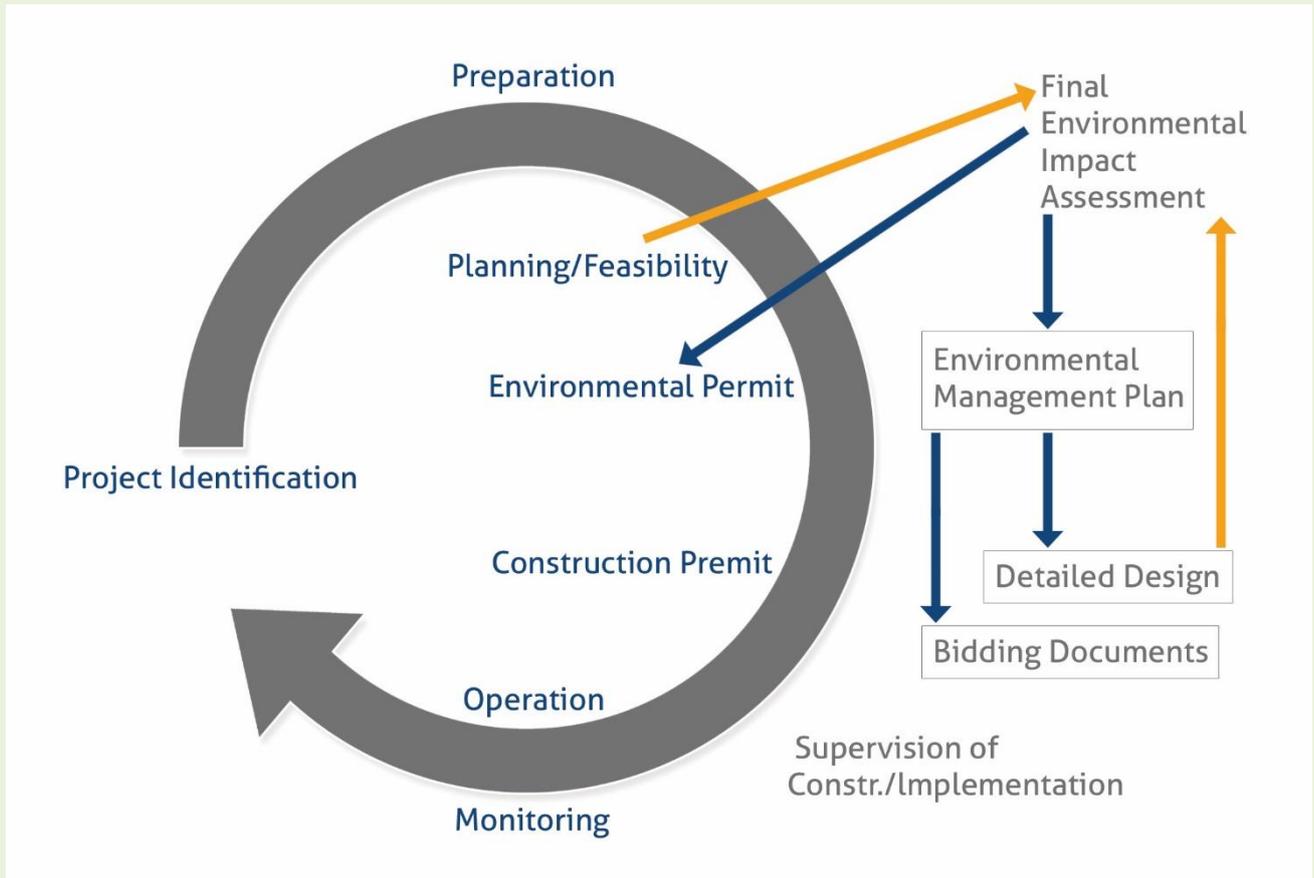


Figure 4-1: EMP Integrated into Project Cycle (World Bank)

#### 4.9.1 Environmental Monitoring Programs

EIA is also concerned with the design of a suitable monitoring programme the objective of which is to provide information to SEZAD and/or relevant authorities on the environmental compliance and the efficiency of the various mitigation measures. The environmental monitoring plan assesses the results, compares with the baseline studies and with national/international environmental guidelines. The monitoring should clearly identify the following

- Operators arrangement for carrying out the work;
- Monitoring Location;
- Monitoring Parameters;
- Method of Monitoring
- Standard or Guideline to be used;
- Schedule and duration of monitoring;
- Evaluation of the result;
- Frequency of Reporting to Authority

The monitoring plan should also include monitoring of the health of person working in the plant particularly the health aspects related to occupational hazards, if required.

#### **4.10 GENERAL REQUIREMENTS DURING EIA STUDY**

Some of the requirements which need to be followed by the Proponents, as applicable are listed below -

1. The Proponent shall submit BAT Compliance Certificate to SEZAD for verification of BAT technology used in the facility design, as applicable;
2. For projects having impacts on the offshore marine environment, a No Objection Letter NOL shall be obtained from Environmental Society of Oman, mentioning that the marine management plan proposed for the project is in line with the requirements of ESO regarding impacts on marine mammals. This is in line with the agreement between SEZAD and ESO for marine mammal protection in the area.
3. For Projects involving use of marine vessels during any phases of the Project, an agreement letter from PDC shall be obtained which agrees to accept and treat all the waste from the marine vessels as per the MARPOL convention or separate waste collection, handling and disposal facility for such waste shall be made available by the Proponent.
4. It shall be noted that on completion of construction phase, the Proponent shall submit an environmental audit report to SEZAD which shows the compliance with EIA/EMP report, environmental permit conditions and relevant Omani/international regulation.
5. All the proposed Company's shall establish an HSE department responsible for safety and environmental concern of the project. Any thread of communication and submission of compliance and other related reports with SEZAD shall be carried out through this department.

#### **4.11 CONCLUSION**

This section describes the conclusions regarding e.g. preferred options compared to alternative solutions, important potential environmental effects, mitigation, decommissioning and remediation, uncertainties and public concerns.

#### **4.12 ANNEXURE**

1. References
2. List of EIA contributors (individuals and organisation)
3. Details of numerical modelling studies (if any) and any calculation sheets;
4. Information sources, consultations, public participation;
5. Documentation including the Scoping process, Stakeholders' meetings engagement, list of contacts, and communications;
6. Results of laboratory analysis by accredited laboratories;
7. Additional related studies (e.g. Traffic Impact Assessment, Environmental Risk Assessment, Quantitative Risk Assessment, etc. where applicable and as required)
8. List of data source;
9. Any other information relevant to the EIA study.



## Appendix-B PROJECTS REQUIRING EIA

As per SEZAD Decision 326/2015, the following are an illustrative list of projects which require detailed EIA study: -

1. Development and management of industrial estates
2. Development and management of logistic sites with an area of 10 hectares or more
3. Development and management of fishing harbours and fish industrial complexes
4. Development and management of tank farms for chemicals and petroleum storage, with an area of 5 hectares or more
5. Development and management of touristic villages with an area of 10 hectares or more
6. Petroleum refineries, chemical and petrochemical industries
7. Heavy industries
8. Hazardous and non-hazardous wastes landfill, treatment and disposal facilities
9. Construction of port quays and jetties
10. Fish farming with production capacity of more than 500 tons per annum for endogenous species, and any production capacity for exotic species
11. Electric power generating plants (Except for gas and renewable energy powered facilities)
12. Seawater desalination plants with production capacity of more than one million cubic meters per annum

**Projects not listed above may also require an EIA before a permit is granted by SEZAD. This shall be decided during the initial screening stage of the project.**

**Any of the above listed projects shall be exempted if the applicant is capable of convincing SEZAD that the project represents a minor change or only a minor addition to an existing project while the impacts shall not exceed the standards stated regarding the conservation of the environment.**



## **Appendix-C TABLE OF CONTENT FOR EIA REPORT**

The Table of Contents (TOC) for the EIA should have the following, at a minimum. The Executive summary shall be summarised at the beginning of the report.

- 1 EXECUTIVE SUMMARY**
- 2 LEGISLATIVE FRAMEWORK**
  - 2.1 Omani Environmental Laws and Regulations
  - 2.2 Applicable Legislations – Brief on important legislations applicable
  - 2.3 Climate Change
  - 2.4 Regional and International Conventions and Protocols
  - 2.5 International Guidelines and Best Practises
  - 2.6 Applicable Environmental Permits
- 3 PROJECT DESCRIPTION**
  - 3.1 Background
  - 3.2 Process Description
  - 3.3 Utilities Requirement during Operation Phase
    - 3.3.1 *Power, Water, Fuel, Chemicals, Raw Materials – Source, Quantity and Storage, Manpower, Solid Waste Management Facility, Wastewater handling, treatment and disposal facility etc*
  - 3.4 Project Construction
    - 3.4.1 *Description of Construction Activities*
    - 3.4.2 *Construction Materials*
    - 3.4.3 *Utilities – Manpower, Power, Water, Fuel, Chemicals – Source, Quantity and Storage, wastewater/chemical treatment plant etc*
    - 3.4.4 *Temporary Accommodation Facility – Location and Associated Facilities*
  - 3.5 Project Schedule
- 4 PROJECT ALTERNATIVES**
  - 4.1 Introduction
  - 4.2 The “No Project” Alternative
  - 4.3 Alternate Project Design, Location, Sourcing of Utilities Considered
  - 4.4 Selection of Sources of Raw materials and Utilities – Alternatives Considered
  - 4.5 Analysis of Best Available Techniques
- 5 BASELINE ENVIRONMENTAL DESCRIPTION**
  - 5.1 Introduction
  - 5.2 Project Site Location

- 5.3 Topography and Landscape
- 5.4 Climate
- 5.5 Ambient Air Quality
- 5.6 Noise Quality
- 5.7 Geology and Soil
- 5.8 Hydrology and Hydrogeology
- 5.9 Terrestrial Ecology
- 5.10 Marine Environment
- 5.11 Socio-Economic Setting
- 5.12 Archaeological and Cultural Heritage
- 6 PROJECT RELEASES TO THE ENVIRONMENT**
  - 6.1 Overview
  - 6.2 Construction Phase Releases
    - 6.2.1 *Atmospheric Emissions – Point Sources, Area Sources, Mobile Sources, GHG Emissions*
    - 6.2.2 *Liquid Effluents – Domestic, Construction Water etc*
    - 6.2.3 *Solid Waste – Hazardous and `Non-Hazardous*
    - 6.2.4 *Noise – Ambient and Working*
  - 6.3 Operation Phase
    - 6.3.1 *Atmospheric Emissions – Point Sources, Area Sources, Mobile Sources, GHG Emissions*
    - 6.3.2 *Liquid Effluents – Domestic, Process Water, Fire Fighting, Treated Effluent etc*
    - 6.3.3 *Solid Waste – Hazardous and `Non-Hazardous*
    - 6.3.4 *Noise*
- 7 IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL IMPACTS**
  - 7.1 Methodology
  - 7.2 Impact Assessment Method
  - 7.3 Significance of Impacts
  - 7.4 Cumulative Impact Assessment
  - 7.5 Construction Phase
  - 7.6 Operation Phase
- 8 CLIMATE AFFAIRS**
  - 8.1 Contact details
  - 8.2 Ozone Depleting Substances (ODS)
  - 8.3 Greenhouse Gas (GHG) Emissions - Construction and Operation Phase

- 8.3.1 *GHG Emission from Energy Source - Combustion of Fuel from the Proposed Project – Construction, Operation Phase*
  - 8.3.1.1 Stationary Combustion Processes
  - 8.3.1.2 Mobile Combustion
  - 8.3.1.3 Fugitive Emissions from Oil and Natural Gas System
  - 8.3.1.4 Land Use and Land Use Change
  - 8.3.1.5 Details of GHG Emission Calculation<sup>1</sup>
- 8.3.2 *GHG Emission from Industrial Process of the Plant / Industry*
  - 8.3.2.1 Details of GHG Emission Calculation<sup>1</sup>
- 8.3.3 *GHG Emission from Solvent Use in the Proposed Plant / Industry*
  - 8.3.2.1 Details of GHG Emission Calculation<sup>1</sup>
- 8.3.4 *GHG Emission from Solid Waste Generation from the Plant / Industry Premises*
  - 8.3.2.1 Details of GHG Emission Calculation<sup>1</sup>
- 8.3.5 *GHG Emission from Wastewater Treatment in the Plant / Industry Premises*
  - 8.3.2.1 Details of GHG Emission Calculation<sup>1</sup>
- 8.3.6 *Reporting of Total Amount of GHG Emissions*
- 8.4 Assessment of Climate Change Impacts and Vulnerabilities
- 8.5 Climate Change Mitigation and Adaptation
  - 8.6.1 *Mitigation*
  - 8.6.2 *Climate Change Adaptation*
- 8.6 Green belt development plan
- 8.7 Climate Affairs Risk Reduction Plan (CARRP) for the Plant/Industry
- 9 ENVIRONMENTAL MANAGEMENT PLAN**
  - 9.1 Introduction
  - 9.2 Construction Phase Management
  - 9.3 Operation Phase Management
  - 9.4 Environmental Monitoring Plan
- 10 CONCLUSION**
- 11 ANNEXURES**

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<sup>1</sup> Please provide information in detail