قطر للبترول
Qatar Petroleum

STANDARDS PUBLICATION

QP GUIDELINE FOR ENVIRONMENTAL ASSESSMENT IN PROJECTS

DOC NO: QP-GDL-V-003

REVISION 1

CORPORATE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT DEPARTMENT (EV)

قطر للبترول
Qatar Petroleum

STANDARDS PUBLICATION

QP GUIDELINE FOR ENVIRONMENTAL ASSESSMENT IN PROJECTS

DOC NO: QP-GDL-V-003

Date	Rev	Description	Prepared By	Reviewed By		Approved By		Corporate Endorsement	
			EVM/12/EVM	EVM	QAS	QA	EV	SQ	MD
02/02/2012	1	Issued as guideline for Corporate use							

TABLE OF CONTENTS

FOREWORD

This document has been developed by Corporate Environment and Sustainable Development (EV), reviewed, by Corporate Quality and Management Systems Department (QA), and circulated for review by user departments before endorsed by Corporate HSE Manager (SQ), and QP Managing Director (MD).

This document is published for use of QP Departments/ Contractors/ Consultants. It should be emphasized that the document is meant for QP projects wherever applicable and appropriate.

The document in its present form reflects, as far as possible, the current QP requirements taking into account the known and applicable regulatory requirements for the proposed QP projects.

This document shall be subject to periodic review to re-affirm its adequacy or to reflect any changes in corporate environmental policy and/or State regulatory requirements.

The Custodian of this document is Corporate Environment and Sustainable Development Department (EV). Therefore, any technical comments, views, recommendations, etc. on this document should be forwarded to the same and copied to Manager, Corporate Quality and Management Systems Department.

1.0 INTRODUCTION

1.1 The aims of environmental impacts assessment in projects are to:

- Inform the process of decision making by identifying potentially significant environmental impacts of development projects;
- Promote sustainable development by ensuring that the projects do not undermine critical resources, ecological functions or the well being of the communities in the surrounding environment.

In the State of Qatar, current environmental regulations require that the overall impact on the environment of development projects proposed by the public and private sectors is assessed as a part of their authorization process. Specifically, Article 7 of the Executive of Regulations issued on 2005 (pursuant to Law No. 30) requires that for the projects listed in its Annex-1 their environmental impact shall be identified and assessed before granting a Permit–to-Construct (PTC).

1.2 In general the objectives of project's environmental impact assessment are:

a) In the short term:

- To facilitate the decision-making process and set the environmental management framework for the project implementation.
- To improve the design of the project, by selecting the best practicable environmental option from the project options;
- To ensure an appropriate and efficient use of resources;
- To identify appropriate measures to prevent and mitigate the potential impacts of the project;
- To predict any residual environmental impacts and define the measures to mitigate and monitor such impacts.

b) In the long term:

- To protect human health and safety;
- To avoid irreversible changes and serious damages to the environment;
- To safeguard natural resources and ecosystems;
- To enhance the social aspects of the project.

This document provides guidance on how to identify QP projects' environmental impacts, assess their significance and include their management in the project planning and execution.

The document describes recommended environmental assessment practices that should be considered at each project stage, to ensure its compliance with current environmental regulations and QP policies and standards.

This document is intended to complement current QP Guidelines and Procedures on HSE Management in projects.

2.0 SCOPE

This guideline is intended to be used to assess potential environmental impacts of new capital projects and/or impacts resulting from significant modifications and upgrades to existing facilities. It covers projects related to oil and gas exploration, production, transportation, storage and processing, as well as those for support infrastructure and services, i.e. civil and building projects.

3.0 APPLICATION AND MANAGEMENT INTENT

It is the management intent that all QP capital projects comply with applicable environmental laws, standards and other regulatory requirements and that all measures are taken to prevent and/ or minimize their environmental impacts.

4.0 TERMINOLOGY

4.1 DEFINITIONS

Asset Holder	Department responsible for the operation and maintenance of a facility or installation.
Best Practicable Environmental Option (BPEO)	The best method for preventing or minimizing the adverse effects on the environment having regard, among other things, to: • The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects. • The financial implications, and the effects on the environment, of that option when compared with other options; and • The current state of technical knowledge and the likelihood that the option can be successfully applied.
Cumulative Impact	Impact on the environment which results from the incremental impact of the project activities when added to other past, present and/or reasonably foreseeable future activities.
Environment	Means the territorial air, land, water and coastal areas of the State of Qatar.
Environmental Aspect	An element of an activity, product or service that can interact with the environment.
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
Environmental Impact Assessment (EIA)	An assessment that focuses on the interactions between a proposed project and the surrounding environment. It identifies the significant environmental impacts the project may generate and the measures proposed to prevent, control and mitigate them.
EIA Terms of Reference (EIA TOR)	Preliminary scope of the EIA Study, to be included as a part of the FEED tendering process in case an EIA Study is required by MoE.
Environmental Management Plan	Document that describes the processes that an organization will follow to manage its environmental aspects, demonstrate compliance with applicable regulations and minimize environmental impacts.
Environmental Measure	Process, practice, technique, material, product, service or energy used to avoid, reduce or control (separately or in combination) the creation of an emission or discharge of

	any type of pollutant or waste.
Environmental Risk Register	Single database to record, track and manage project environmental issues, which is updated continually during the project life cycle.
Incident	Unplanned event or chain of events, which have caused or could have caused injury, illness and or damage (loss), to assets, the environment or third parties.
Likelihood or Probability	An expression of the chance of an event to occur. When assessing environmental impacts generally it is defined in qualitative terms.
Project Executing Department	The department responsible for managing and executing a project.
Risk	Combination of likelihood and consequence(s) of a specified hazardous event occurring.
Risk Assessment	Overall process of risk identification, analysis and evaluation.
Significant Environmental Impact	An environmental impact is considered to be significant when: • It is assessed as significant according to the assessment method. • It is subject to relevant legislation, regulation, permit requirement and/or other requirement. • There is a potential for accidental release which is regulated or that due to its potential volume or characteristics may cause public concern.
Technical Support Document	Document that augments the information required in the Environmental Permit Application and Screening Forms, used to facilitate the understanding of the project and its potential environmental impacts.

4.2 ABBREVIATIONS

CEMP	Construction Environmental Management Plan
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ENVID	Environmental Issues Identification
EP	Environmental Permit
EPIC	Detailed Engineering, Procurement, Installation & Commissioning
ERR	Environmental Risk Register
EV	Corporate Environment and Sustainable Development Department
FEED	Front End Engineering Design
FS	Feasibility Study
MoE	Ministry of Environment
OEMP	Operations Environmental Management Plan

PED	Project Executing Department
PIN	Project Initiation Note
PTC	Permit to Construct
QP	Qatar Petroleum
SOW	Scope of Work for a project or study
TOR	Terms of Reference
TSD	Technical Support Document

5.0 RELATED DOCUMENT

IP-ENV-001	Environmental Assessment and Authorization for Capital Projects
QP-PHL-S-100	QP Philosophy for HSE Risk Management

6.0 ENVIRONMENTAL ASSESSMENT IN PROJECTS

6.1 GENERAL

Environmental Assessment in projects is a process that:

a) Identifies and predicts the potential impacts (adverse or beneficial) of project development on the environment, i.e., changes on the environmental quality of the surrounding environment.
b) Recommends the changes in project location, technologies or raw materials to prevent/minimize the occurrence of these impacts.
c) Prescribes the control measures required to manage and monitor the residual impacts.
d) Communicates this information to project decision makers to effect the recommended changes and when required to MoE to decide upon project approval.

This assessment allows a proactive approach to environmental management in projects and enhances the decision making process, so that all possible pollution prevention measures are examined and included in the project location/technologies and materials selection.

Environmental assessment of projects is an integral part of the project planning process. Its benefits are maximized when the process begins at the earliest possible stage in the project's planning. At early stages the environmental assessment process should focus on identifying those environmental factors that could constrain the project feasibility or significantly impact its costs. The ultimate goal is to ensure that the relationship between a project and its surrounding environment is clearly understood at the outset.

During the design phases the assessment would be focused on identifying the environmental aspects inherent to the processes or facilities and on evaluating the adequacy of the designs and options available. This assessment enables the project team to prioritize the design issues and to decide whether additional controls, over and above standard industry practice, are reasonably practicable.

At the end of the design phase the project is reassessed considering the design measures and controls proposed, in order to identify and assess any residual impacts. These environmental residual impacts are then managed through Environmental Management Plans (i.e. CEMP, OEMP).

6.2 METHODOLOGIES

Environmental assessment in projects can be qualitative or semi-quantitative; however, always some subjectivity is involved in the process, therefore the experience of the team conducting the assessment is critical to ensure better results. The EIA process should be systematic, the detail and accuracy of the analysis varies from a project stage to the next as more information about the project and the surrounding environment becomes available.

In general, the steps taken when carrying an environmental assessment are:

a) Review the project (e.g. processes and activities, products & sub-products, discharges, use of resources, etc.).
b) Analyze the project location site and its characteristics.
c) Identify all environmental aspects.
d) Identify and evaluate the environmental impact(s) these aspects may generate.
e) Identify measures that could be implemented to prevent, control or mitigate the impacts.
f) Report the results of the assessment.

When identifying and assessing the environmental impacts, the activities related to the different project implementation stages shall be analyzed, i.e. construction activities, commissioning and operations start-up, normal operations, emergencies and accidents, and decommissioning. The range of conditions for which the assessment is done shall be clearly stated, as well as the criteria triggering the need for a re-evaluation, if required.

7.0 ENVIRONMENTAL ASSESSMENT IN QP PROJECTS

This section provides guidance on how to prepare or conduct the following environmental assessments at different stages of the project cycle:

- Preliminary Environmental Assessment;
- Environmental Screening of Options;
- Environmental Issues Identification (ENVID);
- Environmental Impact Assessment (EIA) Study.

7.1 PRELIMINARY ENVIRONMENTAL ASSESSMENT

As a part of the Project planning, a preliminary high level environmental aspects and impacts identification is conducted using the methodology described in section 7.3 and completing the environmental 'aspect' and 'impact' columns of the Environmental Risk Register Form included therein.

Environmental aspects identified at this stage are mostly those related to legal and corporate requirements that apply to the project, typical discharges (air emissions, wastewater, noise, etc.) anticipated from the proposed processes and general construction activities.

When identifying potential impacts, it is important to consider whether the project is implemented in a green or brown field, as well as potential cumulative impacts from existing or planned activities in the project location area.

7.2 ENVIRONMENTAL SCREENING OF OPTIONS

When more than one option is identified, the environmental risks related to each of the options are evaluated and screened. This screening exercise ensures that, all

other things equal (e.g. technology, economy, etc.), the best environmental option is selected.

Environmental screening/assessment of each option can be done using information available about the processes, use of resources (water, energy, etc.), discharges (gaseous emissions, liquid effluents, waste) to be generated and controls required before disposing of these discharges into the environment.

Once each option has been assessed, a comparison between the significance of their environmental impacts is made.

Capital and operational costs required for environmental controls for each option should also be considered in the economic viability analyses. The option with the best technical, economical and environmental balance would be the preferred one.

7.3 ENVID PROCESS & ENVIRONMENTAL RISK REGISTER

7.3.1 ENVID Process

An ENVID exercise involves one or more workshops led by a chairman independent from the design team and attended by a team comprising of representatives from the project executing team and the engineering contractor discipline engineers, project environmental consultant, and other discipline engineers, as required.

In these workshops a compilation and review of the project's Process Flow Diagrams (PFD), layouts/plot plans and related available information, as well as the site environmental conditions is done. These are superimposed and used in brainstorming exercises to identify the project's potential environmental impacts. The experience of the professionals participating in the exercise is critical to the success of the ENVID process.

Environmental aspects are identified using the activities proposed at each project phase (construction, commissioning, normal operating conditions, abnormal operating conditions and any foreseeable accidents, incidents and/or emergency situations).

When identifying environmental aspects, the following issues are usually considered:

a) Emissions to atmosphere (point and fugitive sources).
b) Aqueous effluents (domestic and industrial).
c) Waste generation (hazardous and non hazardous)
d) Use of energy, water and material resources.
e) Environmental noise and vibrations.
f) Feedstock, products and by-products storage and handling.
g) Worksite preparation, abandonment and restoration.
h) Accidental releases to land and water.
i) Land use.
j) Marine activities, e.g. dredging, pipe/cable laying activities, etc.

To facilitate the ENVID process, the project can be divided into broad elements/activity/subject areas for detailed discussion during the brainstorming exercise, e.g. processes, utilities and services, etc.

The components of the environment that may be receiving the predicted environmental impacts could be identified by use of Table 1. Information available from previous environmental studies in the project area will facilitate the description of the project surrounding environment and may be provided by EV Department (if available).

After identifying the project environmental aspects and considering the potential receptors, the relevance of environmental impacts can be identified and analyzed.

Table 1: Potential Environmental Receptors

Environmental component	Receptors
Physical environment	• Air • Seawater • Seabed • Coastline • Soil • Groundwater • Topography & Drainage • Natural resources
Biological environment	• Marine biota – Plankton – Benthos – Fish & shellfish – Marine mammals – Seabirds • Terrestrial biota – Flora – Fauna
Socio-cultural environment	• Fishery • Marine activities • Maritime infrastructure • Communities • Commercial & industrial activities

7.3.2 ENVID Methodology

ENVID can be done using the Environmental Risk Register Form included at the end of this Section and the instructions provided therein.

For every impact identified, the potential risk is evaluated by multiplying the projected magnitude of the consequences and the likelihood of occurrence. Both, impact likelihood and consequence are ranked according to the potential changes that would be caused to the surrounding environment.

Table 2 guides the process of evaluating impacts likelihood and consequences. This process allows for a semi quantitative assessment representing the judgment of the assessment team based on the available knowledge and experience but provides a consistent and documented approach across the whole assessment process.

Table 3 presents a summary of the impacts significance rating. For impacts that are rated High (red) an alternative location or technology should be investigated or preventive and control measures shall be incorporated in the project design when no alternatives are available. Impacts rated Medium (yellow) would require environmental control and/or management measures in the project design and implementation plan. The efficacy of these measures would be assessed in the impact monitoring plans that are components of the Project Environmental Management Plan.

For impacts of Low (blue) rating, environmental management measures (e.g. internal procedures, training of staff) would be implemented and continual improvement would be the best approach.

Table 2: Guide to Impact Evaluation

Likelihood (L)		
1	Rare	Event might occur but only under exceptional circumstances
2	Unlikely	Event could occur at some time
3	Possible	Event may occur at some time
4	Likely	Event will probably occur in most circumstances
5	Almost Certain	Event is expected to occur in most circumstances
Consequences(C)		
1	Slight	No detectable impact offsite; slight impact contained within the fence
2	Minor	Minor impact on the environment but not lasting effects
3	Moderate	Limited impact that will persist or require clean up or remediation measures
4	Major	Severe effect that will require extensive clean up or remediation measures
5	Critical	Severe effect with large impact that will risk the use or value of the environment and will require extensive clean up or remediation measures

Table 3: Impact Significance Rating

		LIKELIHOOD (L)				
		Rare 1	Unlikely 2	Possible 3	Likely 4	Almost Certain 5
CONSEQUENCES (C)	Slight 1	1	2	3	4	5
	Minor 2	2	4	6	8	10
	Moderate 3	3	6	9	12	15
	Major 4	4	8	12	16	20
	Critical 5	5	10	15	20	25

Color Code	LOW	MEDIUM	SIGNIFICANT / HIGH

7.3.3 Environmental Measures

When analyzing and selecting environmental measures the technical expertise and experience of the project team is crucial. Measures proposed to minimize potential environmental impacts are of different nature: preventive measures (those that reduce the probability of impact occurrence), control measures (those that limit the extent and/or duration of an environmental aspect) and mitigation measures (those directed to reduce the consequences or impacts generated). Measures to respond and recover from incidents should also be defined taking into account possible failures of preventive and control measures.

Selection of environmental measures should be driven by the need to find a balance between technical, environmental, safety and economical considerations. When defining this balance the concept of Best Practicable Environmental Option (BPEO) may prove useful.

Particular attention should always first be given to risk-reducing measures which have the effect of eliminating or reducing the probability of triggering the environmental aspects. Whenever possible, the use of design principles to manage environmental aspects is preferred.

Factors that influence the selection of environmental measures include:

- Technical feasibility.
- Costs and risks associated with its implementation.
- Degree of uncertainty associated with the aspect, or the measure, including human factors.

As a part of the selection process, proposed measures should be assessed to determine their technical and operational viability and their effect on environmental risk reduction. Based on the results of assessment, also detailed operational and environmental monitoring requirements should be set, as required.

Evaluation of environmental measures should always be based on sound engineering principles and common sense.

QP-GDL-V-003 Environmental Risk Register Form

PIN/Project Number _____ Project Title: _____ Project Stage: _____ Date: _____

Assessment Team: _____ Page _____ of _____

Item #	Aspects and Impacts Identification			Impact Assessment					Environmental Management / Measure	Residual Impact	Additional Measure
	Phase	Aspect	Impact	Legal or QP Rqmt	L	C	LxC	Rating			

L= Likelihood C= Consequence Impact= LxC

Instructions to Complete the QP-GDL-V-003 Environmental Risk Register Form

PIN/Project Number: Include PIN or project number, as applicable.

Project Title: Include the name of the project being analyzed.

Project Stage: Indicate the project stage (i.e. PIN, FS, CO, FEED, EPIC).

Date: Indicate the date when the Register is being completed.

Page: Number of current page with regards to the whole document pages

Assessment Team: Include the name and reference indicator of the assessment team members and/or the name of the consultant, as adequate.

Item #: Consecutive numbering of identified environmental aspects.

Aspects and Impacts Identification

Phase: Phase of the project being assessed, i.e. construction (C), operations (O), operations upset (OU), maintenance (M), start up (ST), shutdown (SD).

Aspect: List the environmental aspects identified for the proposed project, e. g. atmospheric emissions, liquid discharges, handling of chemicals, noise generation, use of resources, waste generation, etc. Aspects listed shall include those related to both project construction and operation phases, as well as operations upset, start up and shutdown.

Impact: For each aspect identified, list the environmental impacts that could be generated, e. g. air quality deterioration, sea water pollution, soil and groundwater pollution, disturbance to neighbours and/or workers, depletion of resources, etc.

Impacts Assessment

Once potential environmental impacts are identified, their significance is assessed.

Legal or QP Requirement: Is there a regulatory requirement, QP Policy or Standard that applies to the environmental aspect identified? Respond Yes (Y) or No (N). Whenever the response is Yes, and there might be a breach to regulatory requirements, the impact is considered Significant; hence the impact rating is only used as a reference, in this case.

L: The likelihood of impact occurrence, shall be rated 1 to 5, Table 2 can be used for guidance. The likelihood may also be defined based on experience with similar projects/facilities in the industry.

C: The severity of the impact on the environment is rated following the guide provided in Table 2. When rating consequences due attention should be given to the site characteristics, for example, the severity of the impact from noise generation within an industrial area would be lower than that in the case the project is located within a residential area.

L x C: To obtain the impact rating, the values assigned for likelihood and consequence are multiplied, the value obtained indicates the significance of the identified impact. Table 3 contains the ratings and their significance.

Rating: The impact significance is rated as indicated in Table 3. This rating defines the significance of the potential environmental impact before any control measures has been implemented. For those impacts rated as Significant/High an alternative location or technology should be investigated or preventive and control measures shall be incorporated in the project design when no alternatives are available. For impacts rated

Medium, environmental measures shall be included in the project design to prevent or minimize them. Impacts with Low rating are usually minimized by environmental management measures, e.g. procedures, training, etc.

In the case the impact generated is positive or beneficial, a letter "B" shall be added also. Positive or beneficial impact refers to those cases where the project generates an improvement or enhancement of the existing environmental quality or quality of life in the area of influence of the project, e.g. recovery of contaminated areas, reduction of discharges to the environment, significant jobs generation, reduction on use of resources, etc.

Environmental Management / Measure: List the environmental measures identified for each impact, when choosing environmental measures, follow the guide provided in Section 7.3.3.

Residual Impact: Once the environmental measures has been selected, residual impacts are identified and listed.

Additional Measure: In the cases where residual impacts are identified, additional management measures should be proposed, e.g. training, procedures, monitoring, etc.

7.4 EIA STUDY PREPARATION AND MOE APPROVAL PROCESS

Figure 1 summarizes the overall process to prepare an EIA study and to obtain approval from MoE. As could be discerned from the figure, there are two approval stages:

- Approval of the EIA Study Scoping Report, before initiating any field work.
- Approval of the EIA Study Report and the subsequent issuance of the project environmental Permit-to-Construct (PTC).

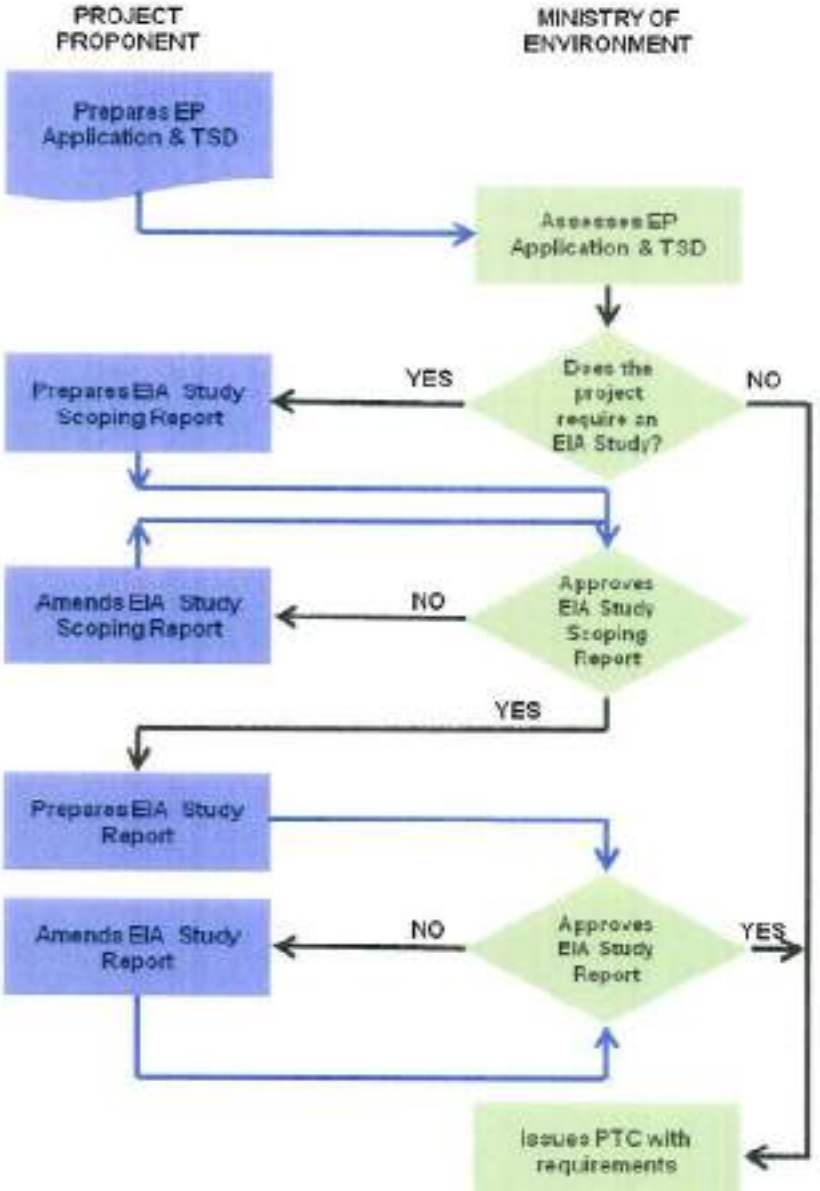

Figure 1: Outline of EIA Study Preparation and MoE Approval Procedure

7.4.1 EIA Scoping Report Preparation

The EIA Scoping Report is usually prepared by an environmental consulting firm that is independent of the FEED contractor. The environmental consultant prepares the Scoping Report by using as a base the EIA TOR included in the FEED SOW and any other specific requirements made by MoE in response to the project EP Application submission, if not included in the EIA TOR.

EIA Scoping defines the scope of the required studies and the approach and methodologies to be used while preparing the EIA Study Report.

EIA Study scope must be flexible enough to allow new issues that emerge during the course of the environmental studies, or as a result of changes in the project design be incorporated in the assessment.

The EIA Scoping Report is primarily focused on identifying the impacts to be assessed and which of these are most important. It also addresses the baseline studies required to characterize the existing environment and the methods proposed to predict the magnitude of environmental impacts.

Some preliminary data collection, including review of available environmental data, previous studies in the project area or from similar projects and field work is usually required when preparing the Scoping Report. Also consultation with QP concerned departments may be needed in order to ensure that all issues related to the project development and the EIA study requirements are well covered.

EIA Scoping Report shall include:

a) Executive summary.
b) Policy, legal and administrative framework.
c) Description of the proposed project.
d) Description of the surrounding environment based on available information and scope for proposed baseline surveys (physical, biological and socio-cultural environment).
e) Description of the methodology to be used for environmental impacts identification and assessment, including criteria against which the significance of impacts would be evaluated.
f) Preliminary environmental aspects and impacts identification and assessment.
g) Environmental measures already included in the project.
h) Any further consultations to be carried out when conducting the study.
i) Structure and content of the EIA Study Report.
j) EIA Study team organization.
k) Work plan and resourcing for proposed environmental studies.
l) Appendices as required.

7.4.2 Conducting the EIA Study

The EIA Study would be prepared according to the scope defined in the Scoping Report approved by MoE. The study is conducted 'in parallel' with FEED stage activities because the approval process and any conditions dictated by MoE may require iterative modifications to the front end engineering design, and should therefore be completed before entering the detailed design phase.

Although determination of the significance of an impact is subjective, mainly based on professional judgment, a defined methodology, transparent and verifiable, shall be used during the assessment process, to make it as objective as possible. The

primary purpose of identifying the significance of an environmental impact is to identify where further measures are required to control the risk to an acceptable level.

Attention shall be given to the nature of the effect being assessed, as it can be: direct or indirect; short, medium or long term; permanent or temporary; negative or positive.

When describing and evaluating a potential impact, detailed consideration to a number of factors such as: effect, action, duration, spatial extent, reversibility, frequency, likelihood, should be given.

In general, the main components of environmental impact assessment can be summarized as:

a) **Characterization of the baseline conditions and sensitivity of the receiving physical, biological and socio-cultural environment:** A necessary and important element of any environmental assessment is to gather qualitative and quantitative information on the environmental components that are likely to affect and be affected by the proposed project. When evaluating the sensitivity of the environmental components at the proposed project location, the nature of the receptor and its capacity to accommodate change, as well as applicable legislative requirements shall be considered. The sensitivity of the receptor can in some cases become a critical factor in the evaluation.
b) **Identification of regulatory requirements applicable to the project:** A review of legal and corporate requirements that apply to the project environmental management is carried out by considering the type and the nature of the project and in consultation with State Environmental Protection Law No. 30 and its Executive regulations.
c) **Identification of the project environmental aspects and impacts:** The relationship between environmental aspects and environmental impacts is one of cause and effect. The identification of environmental aspects and impacts should consider aspects arising from the entire project life-cycle.
d) **Identification of the magnitude of change/impact upon the receptor:** There are numerous methods and techniques available to assess and predict the magnitude of environmental aspects. The method used should be tailored to the potential significance of the anticipated environmental quality change in the surrounding environment of the project. The assessment should consider the magnitude of change taking into account the temporal and spatial scale of the impact.
e) **Assessing the likelihood of the impact:** An assessment is undertaken on the likelihood of the impact occurrence. In some instances, although the sensitivity and magnitude may be high, the actual likelihood of occurrence may be low.
f) **Assessing the impact significance:** The significance of project environmental impacts can be evaluated using the environmental risk matrix shown in Table 3, Impact Significance Rating, a similar regime or other semi-quantitative method. Always consideration shall be given to the inherent subjectivity of the subject matter. Rating impact significance seeks to assess the relative significance of the predicted impacts to focus on the key adverse ones.
g) **Assessing cumulative impacts:** Cumulative impacts generally arise from the combination of impacts from the proposed project and from other existing activities or proposed and permitted projects in the vicinity, acting together to generate higher levels of change in the environmental quality of the project site. In these cases, usually modeling tools are used to determine the cumulative impact.

h) **Recommendation of preventive/mitigation measures:** This process involves the introduction of measures to avoid, reduce, remedy or compensate for any significant adverse impacts. In the case that additional measures have to be included in the project to minimize its impacts, these mitigation measures must be identified and informed to the engineering design team to assure that the required changes to the project design are considered.

i) **Definition of project environmental management plans:** The scope for Environmental Management Plans, to be implemented during construction and operation phases of project to manage and monitor the efficiency of the measures implemented and any residual impacts are prepared as a part of the EIA Study process.

7.4.3 EIA Study Report

The EIA Study Report should contain as a minimum:

a) Executive Summary

b) Project description, including:

- Objective, justification, location, layouts, alternatives considered during project definition.
- Project planning, including stages/phases, estimated workforce during construction and operation phases.
- Processes description, flow diagrams, mass balances.
- Construction activities and resources and services management during construction.
- Operational activities and resources and services management during operations.
- Estimated atmospheric emissions, noise, wastewater streams, hazardous and non hazardous waste inventory, including quantities and composition during construction and operations.
- Environmental controls included in the design.

c) Characterization of the project site and influence area, using data available from previous baseline studies and that from the environmental studies conducted as a part of the EIA Study. The criteria used to define the project's influence area and methodologies used when conducting the environmental baseline studies shall be summarized.

d) Legal and corporate requirements that apply to the project.

e) Methodology used to identify environmental aspects and determine environmental impacts significance, including limitations and assumptions made during the assessment process.

f) Summary of identified environmental aspects, potential impacts and risk assessment results.

g) Proposed environmental measures to minimize significant environmental impacts.

h) Proposed environmental performance and monitoring system and the framework to be used to prepare the project CEMP and OEMP.

i) References.

j) Names and qualifications of the assessment team.

k) Appendices, as required.

REVISION HISTORY LOG

Revision number: 1 **Date:** 02/02/2012

Item Revised:	Reason for Change/Amendment:
	Changes/Amendments : This is a new document which guides on the how environmental assessment should be done at each project stage.

Note:

The revision history log shall be updated with each revision of the document. It shall contain a written audit trail of the reason why the changes/amendments have occurred, what the changes/amendments were, and the date at which the changes/amendments were made.

Date: 14/12/2022

Disclaimer

The information provided on our website is for general information purposes only. While WKC endeavours to provide the most up to date and accurate information, documents and links on our website, we will not be held liable for any loss or damage including without limitation, indirect or consequential loss or damage, or any loss or damage whatsoever arising from the use any of the information provided on our website. For any queries regarding the information on our website, please contact us on enquiries@wkcgroup.com.