ACWA Power Zarqa CCGT Project

Zarqa, Jordan

Updated Environmental and Social Impact Assessment

Volume 3 – Outline Environmental & Social Management and Monitoring Plan

Prepared for:

ACWA Power

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List of Abbreviations

Abbreviation	Meaning
ACWA Power	International Company for Water and Power Projects
AERMOD	The American Meteorological Society/Environmental Protection Agency Regulatory Model
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CEGCO	Central Electricity Generating Company
CESMP	Construction Environmental & Social Management Plan
CEMS	Continuous Emission Monitoring System
DA	Degraded Air shed
dB(A)	A-weighted decibels
dB(C)	C-weighted decibels
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
ESMMP	Environmental Management & Monitoring Plan
EPs	Equator Principles
EPC	Engineering, Procurement and Construction (Contractor)
EPFIs	The Equator Principle Financial Institutions
ESIA	Environmental & Social Impact Assessment
ESS	Environmental Scoping Study
GT	Gas Turbine
HFO	Heavy Fuel Oil
HRSG	Heat Recovery Steam Generator
IFC	International Finance Corporation
IPP	Independent Power Plant
LAeq	A-weighted Equivalent Continuous Sound Level
LAmax	A-weighted Maximum Sound Level
LCpeak	C-weighted Peak Sound Pressure
MoE	Ministry of Environment
MW	Megawatt
NEPCO	National Electric Power Company
NDA	Non-Degraded Air shed
OESMP	Operational Environmental & Social Management Plan
OHTL	Overhead Transmission Line
O&M	Operation and Maintenance
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometers.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometers.
PPA	Power Purchase Agreement
PR	Performance Requirements (EBRD)
PS	Performance Standards (IFC)
SEPCO III	SEPCO III Electric Power Construction Corporation
ST	Steam Turbine
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAJ	Water Authority of Jordan
WB	World Bank
WHO	World Health Organisation
5 Capitals	5 Capitals Environment and Management Consultancy

1 INTRODUCTION

This Outline Environmental & Social Management and Monitoring Plan (ESMMP) has been prepared as part of the Updated ESIA for the 485MW ACWA Power Zarqa CCGT Project being developed by ACWA Power Zarqa (the Project Company). This document is Volume 3 of the Updated ESIA and provides detailed environmental and social actions and initiatives that will be developed within the EPC contractors CESMP and the Operational & Maintenance Company's OESMP, and will therefore be implemented during the construction and operational phases of the project. This plan is a requirement of the Jordanian Ministry of Environment and the projects lending institutions (notably EBRD and IFC).

As the information included to this Outline ESSMP is for use by the EPC Contractor (i.e. SEPCO III Electric Power Construction Corporation (SEPCO III)) and the O&M Company (i.e. Central Electrical Generating Company (CEGCO)) to develop their project specific CESMP and OESMP, the mention of any further management plans is intended as a guide for such documents to be prepared by the EPC or O&M respectively. Such documents must be prepared on a site-specific basis and must be relevant to the SEPCO III, any subcontractors and CEGCO personnel, any specific external agencies and other stakeholders.

The action items proposed in the ESMMP are the minimum requirements that the contractors and operators must follow during construction and operation and are consistent with the mitigation and monitoring activities outlined in the Updated ESIA Volume 2.

2 PURPOSE OF AN ESMP

The CESMP and OESMP include detailed sets of measures and procedures designed to ensure the implementation of the mitigation and monitoring measures, which have been outlined in Volume 2 of this Updated ESIA. These measures will be implemented at all stages of the project development, from construction, commissioning, and operation. It is noted that the ESMMP and its subsidiary CESMP and OESMP's are living document and will be continually revised as necessary, or where specific changes occur on the site. A decommissioning plan for the proposed project will be prepared at an appropriate point of time in the future, in good time before decommissioning commences.

This Outline ESSMP indicates the environmental and social management structure, which will be responsible for implementing the procedures of the CESMP and OESMP; including recommended organisation structure and roles and responsibilities of team members.

The CESMP and OESMP are specific in nature and will be amended and configured prior to and during all phases as circumstances or activities change on site. This Outline ESMMP includes framework measures designed to ensure and assess the long-term effectiveness of the project's environmental and social mitigation measures defined in the Volume 2 of the Updated ESIA, as follows:

- Program of audits and inspections;
- Procedure for recording and reporting environmental and social incidents;
- Procedures for recording complaints regarding environmental and social issues;
- System for liaising with the environmental regulatory authorities;
- Procedures for regular review of the effectiveness of the CESMP and OESMP; and
- Program for environmental and social monitoring.

2.1 Objectives of Environmental & Social Management and Monitoring Plans

The main objective of ESMMPs is to ensure that the various adverse impacts associated with the project are properly mitigated and managed. The objective of the ESMMP at various stages of the project planning and implementation are as follows:

Construction Phase

- To prevent and reduce the negative environmental and social impacts of the project by implementation of approved mitigation & management measures defined by the Updated ESIA; and
- To ensure that the provisions of the CESMP are strictly followed and implemented, maintained and regularly improved through effective monitoring.

Operational Phase

- To prevent or minimise the deterioration of environmental and social parameter through the implementation of approved mitigation & management measures defined by the updated ESIA; and
- To ensure that the provisions of the OESMP are strictly followed and implemented maintained and regularly improved through effective monitoring.

2.2 Environmental and Social Management Plan Policy/Requirements

Jordanian

'The Environmental Management Plan (EMP), in accordance with Annex 5 of EIA Regulation No.37 of 2005 (Jordan, 2005a), is a separate report from the EIA document that should address each activity at the facility for all phases of the project (construction, operation, and decommissioning) to which an environmental limitation or other requirement applies or for which a mitigation measure will be implemented. The EMP is a stand-alone document that will be a "living document" for use during inspections that should be continually updated as needed as the project goes to construction, operation and long-term monitoring. This document must provide sufficient information for the inspection department to use during the inspection process.'

*(*Source: Jordan Ministry of Environment, Guidance for Preparing Environmental Impact Assessments*)*

Lender Requirements

EBRD

The following is referenced from EBRD Performance Requirement 1 in regard to Environmental and Social Management Plans:

'Taking into account the findings of the environmental and social assessment process and the outcomes of stakeholder engagement, the client will develop and implement a programme of actions to address the identified project's environmental and social impacts and issues and other performance improvement measures to meet the PRs. Depending on the project, the programme may consist of a combination of documented operational policies, management systems, procedures, plans, practices and capital investments, collectively known as Environmental and Social Management Plans (ESMPs).

The ESMP will reflect the mitigation hierarchy and, where technically and financially feasible,

favour the avoidance and prevention of impacts over minimisation, mitigation or compensation, and ensure that all relevant stages of the project are structured to meet applicable laws and regulatory requirements and the PRs. Where affected individuals or groups are identified as disadvantaged or vulnerable during the appraisal process, the ESMP will include differentiated measures so that adverse impacts do not fall disproportionately on them and they are able to take advantage of opportunities to bene t from the project. Where relevant, the ESMP will also cover management of third party and supply chain issues.

The level of detail and complexity of the ESMP will be commensurate with the project's impacts and issues addressing risks, impacts and opportunities specific to the project. The ESMP will de ne desired outcomes as measurable events to the extent possible with elements such as targets and performance indicators that can be tracked over de ned periods. Recognising the dynamic nature of the project development and implementation process, the ESMPs will be responsive to changes in project circumstances, unforeseen events, regulatory changes and the results of monitoring and review, and will be updated from time to time.

The ESMS, including any specific requirements and actions it sets out, will apply to the project regardless of whether it is carried out directly by the client or through contractors or subcontractors. It is the client's responsibility to ensure that contractors working on project sites meet these requirements by adopting and implementing an appropriate contractor management system. Effective contractor management includes:

- *assessing environmental and social risks associated with contracted works and services and incorporating relevant ESMP conditions into tender documents as appropriate, contractually requiring contractors to apply these standards and provide for mitigation of non-compliance*
- *overseeing that contractors have the knowledge and skills to perform their project tasks in accordance with the contract conditions*
- *monitoring contractor compliance with the contract conditions*
- *in the case of subcontracting, requiring contractors to have similar arrangements with their subcontractors.*

Requirements related to labour and working conditions of non-employee workers are outlined in PR 2. Requirements on occupational health and safety of all workers are in PR 4.'

IFC

In regard to management plans, IFC Performance Standard 1 outlines the following:

'The management programs will establish environmental and social Action Plans, which will define desired outcomes and actions to address the issues raised in the risks and impacts identification process, as measurable events to the extent possible, with elements such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods, and with estimates of the resources and responsibilities for implementation. As appropriate, the management program will recognize and incorporate the role of relevant actions and events controlled by third parties to address identified risks and impacts. Recognizing the dynamic nature of the project, the management program will be responsive to changes in circumstances, unforeseen events, and the results of monitoring*

and review.'

A relevant footnote (denoted by the asterix) explains:

*'*Action plans may include an overall Environmental and Social Action Plan necessary for carrying out a suite of mitigation measures or thematic action plans, such as Resettlement Action Plans or Biodiversity Action Plans. Action plans may be plans designed to fill in the gaps of existing management programs to ensure consistency with the Performance Standards, or they may be stand alone plans that specify the project's mitigation strategy. The "Action plan" terminology is understood by some communities of practice to mean Management plans, or Development plans. In this case, examples are numerous and include various types of environmental and social management plans.'*

Besides the above, the IFC PS1 continues to outline the expected contents of management programs, which should include, but not be limited to: On-going Monitoring, Emergency Preparedness, Stakeholder Engagement, External Communications and Grievance Mechanism, Reporting.

3 CESMP REQUIREMENTS

In order to ensure compliance with environmental legislation, both national and international, the Construction Environmental and Social Management Plan (CESMP) will be developed to manage environmental risks during the construction phase. The final CESMP will need to be prepared by the EPC and all sub-contractors before construction works commence will be obliged to adhere to its contents. This also includes following and enacting proper management structures and procedures.

The key benefits of a CESMP are to:

- Provide the organisation structure and responsibility to manage the environmental and social components of the projects construction;
- Provide a commitment that the approved (MoE and lender approved) mitigation and monitoring measures are implemented on the site;
- Provide a system to monitor environmental and social performance of the project against baseline conditions;
- Provide a system for the formal identification of potential environmental and social impacts associated with construction processes; and
- Enable the identification of objectives and targets.

The CESMP will be required to cover all construction components of the proposed ACWA Power Zarqa CCGT project and will provide detailed mitigation, management and monitoring for individual activities. The purpose of these is to reduce the severity of impacts during construction of the Project through avoidance, prevention, reduction and rectification.

The actions to be set out in the CESMP are intended to act as a tool for anticipating, recording and ameliorating any potential or actual impacts that may arise. In this regard, the CESMP will be designed to specify timing and technical aspects of optimising or reducing positive and negative impacts, respectively and will evolve as the projects construction progresses to ensure that its content reflects the current construction programme.

As a more practical approach, the specific requirements of the CESMP will be updated in accordance with the developing stages of construction.

Managers and supervisors for all parties on site (EPC and sub-contractors) are responsible for providing assurance that their work unit is following the CESMP. Including actions in the work method statements and conducting regular audits of the management system can achieve this. A documented auditable trail will be established for verification purposes and should be available in the site-offices.

The content of this chapter will be used as a basic structure to provide a foundation upon which the development of a CESMP can be achieved. The following chapter describes the anticipated key contents of the full CESMP.

3.1 Site Description and Existing Conditions

The CESMP will be required to include the following:

- Location of the Project, including a site plan, showing construction site boundaries;
- Position of the project in relation to any sensitive receptors identified in the ESIA; and
- Access roads to the sites.

3.2 Description of the Construction Works

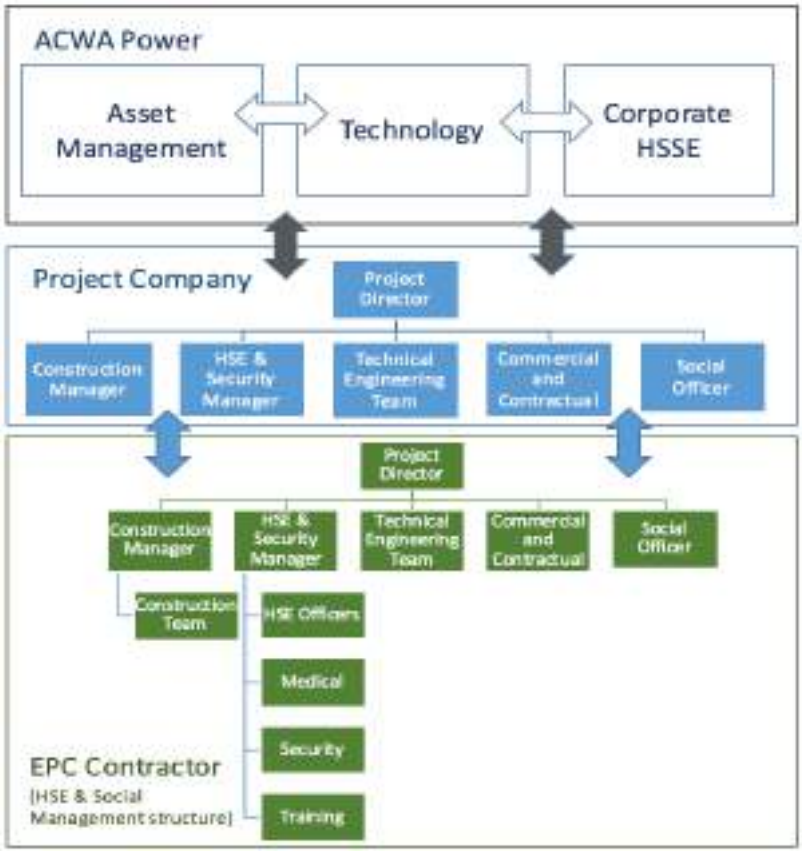
The CESMP will provide a detailed programme of the construction activities of the CCGT project and will include, as a minimum:

- Proposed dates and sequences of the planned works with relation to the environmental and social issues outlined within this report in order to minimise disturbances to the local communities;
- Details of proposed normal working hours and intended start up and close down times;
- List of the equipment to be used;
- List of required equipment and site services such as water supply, sanitation, solid waste facilities, power supply, etc;
- Details of the storage facilities required, e.g. for fuels, hazardous substances, chemicals, etc. and describe the method and minimum requirements for building these storage facilities;
- Vehicle access routes/points;
- Methods of the delivery/removal of materials/wastes and equipment;
- Details of proposed site accommodation; and
- Location of storage facilities for pipe sections, tools, equipment, chemicals etc.

3.3 Environmental Management Staff: Roles and Responsibilities

The HSE Management structure during construction is presented below and will operate on a top down structure from ACWA Power in order to use the wider ACWA Power policies as the basis for all project related HSE and HR policies for ACWA Power Zarqa and SEPCO III.

Figure 3-1 Construction HSE Management Structure



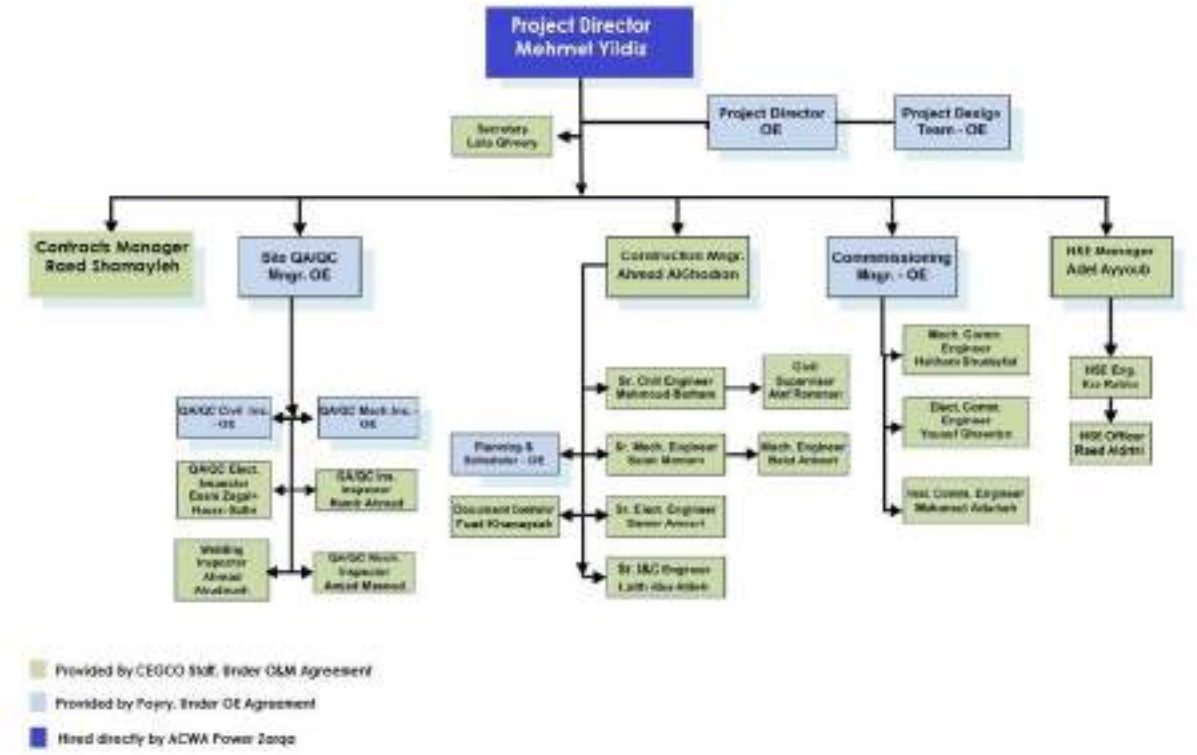
ACWA Power Zarqa will employ 6 staff during construction. This will include:

- 1 CEO;
- 1 Project Director;
- 1 CFO;
- 2 Accountants;
- 1 Public Relations Manager;

Additional staff not listed above include those from the Owners Engineer (Poyry) and those from CEGCO who will work with ACWA Power Zarqa under the O&M Agreement. The staff from Poyry and CEGCO (under the O&M Agreement) can effectively be considered part of the project company.

The proposed structure of ACWA Power Zarqa during construction (for staff stemming from the Project Director) is shown below, with staff included from the owner's engineers (Poyry) and those associated with o CEGCO, under the O&M Agreement.

Figure 3-2 ACWA Power Zarqa Staff Organogram



As per the above staff organogram, ACWA Power Zarqa's staffing structure includes a HSE Manager and HSE team. The HSE Manager and Team are provided by CEGCO under the O&M Agreement and will oversee HSE on behalf of the project company, ACWA Power Zarqa. This HSE team will oversee SEPCO III's dedicated HSE Team on-site. Both HSE teams will be subject to co-ordination and inspection by ACWA Power Corporate HSE personnel.

The CESMP will further present documentation detailing the management structure encompassing all staff responsible for environmental work. The CESMP will need to define the respective roles and responsibilities with regard to the environment and identify the site's responsible Environmental Manager. Descriptions of individual environmental team

responsibilities are outlined below and should not be limited to, the following team members. All personnel on site are responsible for protecting the environment and community by ensuring that appropriate protection measures are implemented as per the CESMP.

Table 3-1 Proposed Roles and Responsibilities of the EPC Contractor Team (including sub-contractors and visitors)

Role	Responsibilities
Project Director/ Manager	• Understand the requirements and objectives of the CESMP; • Ensure resources (personnel and financial) are available to prepare and implement the CESMP; • Overall responsibility for environmental and social performance; • Approve reports of environmental issues and non-conformance to the client in the regular reporting and when any issues arise; • Facilitate proactive communication between all role-players in the interest of effective environmental and social management; • Implement temporary work stoppages where serious environmental or social infringements and noncompliance occur; • Enforce compliance with CESMP and all legal regulations; • Ensure all employees undergo environmental and social training; and • Ensure the CESMP is updated and approves the final updates
Construction Manager	• Responsible for overall environmental performance of the contractor and subcontractors; • Allocate sufficient resources to ensure compliance and effectiveness of CESMP; • Ensure sub-contractors have a copy of the CESMP and are aware of their environmental obligations; • Enforce compliance with CESMP and all legal regulations; • Communicate environmental and social aspects with PM and HSE managers; • Ensure Environmental training is undertaken; • Ensure community complaints are addressed; • Ensure that an Environmental & Social Manager is assigned to the team; and • Maintain document registers for training, incidents, waste management and other related environmental reporting requirements.
Environmental & Social Manager	• The first point of contact for all matter environmental and social; • Responsible for the implementation of the CESMP • Responsible for updating the CESMP • Check CESMP compliance with legal requirements on regular basis; • Communicate and advise PM and subcontractors on environmental and social aspects; • Responsible for ensuring all applicable parties re implementing the CESMP; • Participate in weekly site meetings, so that environmental and social issues are on the agenda; • Set up program for regular monitoring;

Role	Responsibilities
	• Respond to grievances (from staff and external grievances); • Conduct inspections to monitor environmental performance and compliance with the CESMP by contractors; • Ensure the environmental and social meetings are held on a regular basis; • Report, investigate and follow up on incidents (environmental and social); • Establish corrective action plan for any non-compliance including action plan for prevention of such misconduct or incident; • Develop, implement and manage the environmental & social training program; • Ensure that an auditable trail of environmental and social site performance data is recorded and maintained; • Keep updated on environmental and social news, media, training and developments in order to convey any observed issues.
Site Managers/ Supervisors	• Enforce environmental measures on lower levels; • Ensure compliance with CESMP directly on site; • Communicate environmental and social aspects with Environmental & Social Manager and lower level management and personnel; • Ensure that he/she is knowledgeable of Environmental and Social issues; and • Report all incidents and non-compliance to PM and Environmental/Social coordinator.
Sub Contractor - Managers	• Implement the requirements of the CESMP; • Allocate the necessary resources to ensure compliance and effectiveness of the CESMP in specific working areas; • Cooperate with the Environmental & Social Manager to ensure that site inspections and training are conducted; • Comply with the observations and requirements for corrective actions, which are issued by the inspector; • Report all incidents and non-compliance to Site manager; • Notify the Construction Manager & Site Manager of any changes on the program, construction method which may affect the environmental mitigation & management measures and ability to comply with the CESMP and regulations; • Maintain a register of incidents and waste management for future audits;
Construction Workers	• Undergo environmental and social awareness training; • Undergo Health and Safety awareness training (provided by an H&S specialist in accordance with H&S guidelines provided under a separate study) • Understand environmental procedures and environmental /social aspects relevant to activities; • In case of any accident or non-compliance report that immediately to foreman.

Role	Responsibilities
Visitors	Visitors refers to individuals who are not directly involved in construction works and therefore might not be familiar with the environmental requirements of the CESMP but that they require to access the Project site during the construction phase for specific tasks or meetings such as suppliers, service providers and Project company staff • All visitors must comply with the CESMP (supervised by on-site personnel); • All visitors must receive an induction before entering the site and must comply with the instructions given by site staff.

Resources

All levels of management, an in particular the Project Company, are accountable to ensure that the necessary resources are available for implementing and accomplishing environmental and social responsibilities as per the CESMP. Therefore, the following issues will be provided and assured:

- Appointed Environmental & Social Manager (and assistants) will be competent and experienced in the relevant issues;
- Suitable time will be allocated to manage these issues;
- Environmental and Community awareness training will be provided;
- Suitable documentation will be provided;
- Appropriate equipment will be appropriated; and
- Suitable budget will be allocated for managing environmental and social incidents.

3.4 Applicable Legislation, Policy and Environmental/Social Principles

Regulatory Authorities

The Jordanian Ministry of Environment have the regulatory responsibility to ensure the project is executed in accordance with national legislation. Routine site inspections may be carried out by representative officers from the MoE in order to conduct compliance audits.

The same may be expected by the lenders and any appointed lenders independent advisors (further information regarding independent auditing is provided later in this volume).

The CESMP will need to include a section that:

- Specifies the overall policy statement for the project that may include aspects such as environmental induction training for all contractors, subcontractors and staff and other social, health and safety aspects.
- Identifies the applicable national and international legislative requirements, guidelines and standards such as legislation in relation to pollution control, endangered species, hazardous waste standards, contaminated land, heritage and archaeology, and employment and social rights issues.
- Describes a grievance redress mechanism that should be implemented during the construction of the project.

To ensure compliance with applicable laws and standards it is recommended that the project documents all applicable laws, regulations and standards.

3.5 Environmental/Social Requirements and Compliance

The CESMP will cover compliance requirements, monitoring and auditing procedures, roles and responsibilities and remedial actions. The CESMP will be submitted to the Ministry of Environment (MoE) for review and approval The CESMP will also be submitted to the international lenders and reviewed by its independent environmental and social advisors. If required, a corrective action plan will be developed accordingly.

The CESMP will include the requirements set out in the approval permit. It will therefore include:

- Procedures for monitoring construction processes against the national and international standards and with regard to the project environmental and social objectives; and
- Procedures for dealing with major pollution or other environmental incidents that could unexpectedly occur during the construction phase (including timeline and the notification/reporting to the relevant authorities as well as the international lenders) and which are particularly related to air quality (e.g. dust), ecology (e.g. protected fauna/flora), ground/soil quality (contamination issues), noise and vibration, water resources, waste management, cultural heritage (e.g. archaeological finds) and land access issues.

3.6 Environmental/Social Training and Awareness Program

Training and awareness programmes are an extremely important part of the CESMP and of the overall project development. All staff and labourers working on site will be required to attend an environmental/social awareness and training program as part of their site induction, prior to commencing work, which will include:

- Induction training for general environmental and social awareness and the content of the CESMP;
- Site induction training that will highlight the specific environmental (and health safety requirements described in a separate specialist framework management plan) requirements and activities being undertaken at the worksite including hours of operation, noise and vibration limits, necessary mitigation & management measures, soil and water control measures, sensitive receptors and local community issues, traffic access, site entrance and exits etc.;
- Dealing with and handling hazardous and non-hazardous wastes;
- The importance of waste recycling and associated procedures;
- Training on the emergency preparedness and response plan (as prepared by EPC);
- Training on incident notification, investigation and reporting;
- Training for traffic monitoring and management; and
- Induction training for construction site visitors.

It is recommended that this be incorporated with a safety training programme, which will also be required for all employees working on the CCGT project site.

3.7 Identifying the Environmental and Social Issues

A summary of the environmental/social issues and aspects will be included within the CESMP and prepared based on the findings and various risks identified in the Updated ESIA. This summary will be updated to reflect any additional risks resulting from the contractors/subcontractors selected methods of working, changes in site conditions, changes in program, and changes in design.

Given the nature of the project and as per the social and environmental assessment, risks would be identified within the CESMP, which would include the categories for the environmental and social aspects outlined within the Updated ESIA.

3.8 Monitoring, Recording, Inspection and Auditing Program

Daily inspections of work areas by the EPC Contractor Supervisor and weekly inspections as a minimum by the Environmental/Social Manager will also need to be conducted to identify any issues or non-compliance with the CESMP and to monitor the daily work practices.

A weekly inspection checklist will be prepared and will be provided to the External Auditors for evaluation, which will involve all the subcontractors to discuss environmental and social issues and their rectifications.

Independent audits need to be undertaken quarterly by an external consultant to ensure that the lenders can receive periodic updates regarding the environmental and social performance of the project. Such audits will check the following:

- Compliance with applicable national standards and regulatory requirements (including lender requirements), as per the CESMP and site-specific procedures/method statements;
- Checks on site works, monitoring records, inspection checklists, and other relevant documentation;
- Identification and documentation of non-conformances,
- Identifying the requirements for corrective actions.

The outcomes of the audit will be documented including non-conformances, recommendations and corrective actions.

3.9 Communication and Grievances

Communication, both internally and externally, are an important aspect of successful project delivery. Internal communication include arranging regular meetings for the Project team to review and co-ordinate project progress with regards to environmental and community issues.

Public Communication Program

The Project developer will prepare and implement a Public Communication Program to provide ongoing information to the affected Stakeholders and general public on the key relevant environmental and social aspects throughout the construction phase. This program will build upon the Stakeholder Engagement Plan (SEP) to be prepared separately to the Updated ESIA, and will utilise mass media, bulletins and other communication forms to communicate and consult with affected Stakeholders.

The main actions of the Public Communication Program are:

- Timely and appropriate provision of information to the local communities prior to and during the construction activities (directly by Project developer and/or through the Construction Contractors).
- Twice yearly update of the project status by the Project developer to the local communities.
- Provision of specific information on an as need basis, should any significant changes in the project planning occur, which may affect certain Stakeholders (e.g. re-alignment of access roads, or change of construction schedule).

The Public Communication Program will be coupled with the Grievance Mechanism, which provides Stakeholders a way to formally register any complaints/ grievances to the project developer about the Project's environmental and social performance. Such a mechanism will include a signboard along the projects boundary which will provide the contact numbers/details of the Project Team, in order for the local community to be able to contact them.

The grievance mechanism seeks to resolve concerns promptly, using a transparent process that is culturally appropriate and readily accessible at no cost and without retribution to the party that originated the issue or concern. The mechanism covers any type of complaint whatever the subject and nature, and will include the following steps:

- All grievances will be logged (by methods outlined in the SEP) and reviewed by the Environmental & Social Manager.
- The Site Environmental & Social Manager will identify the mechanism to redress the grievance, will identify the party responsible for accomplishing the task and will issue the instruction to complete the action.
- The site Environmental & Social Manager will review the adequacy of the action and approve the completion of the action.
- All steps of the process will be logged in the Grievance register and the relevant environmental issue of the CESMP will be updated accordingly (i.e. monitoring, training, material supplies, budgeting, staffing… etc).

The Grievance Mechanism will be updated as appropriate during the project lifecycle. The EPC Contractor will also be required to implement a Grievance Mechanism to address as efficiently and directly as possible any complaints from the stakeholders.

3.10 Document Control and Review

All documents relevant to the CESMP will be controlled onsite. The controlled documents include the CESMP report, procedures, audit reports, incident reports, records, and community complaints. The EPC Environmental and Social Manager will be responsible for the quarterly review of the CESMP, its procedures and its implementation on site. If any new machinery or process is introduced on site, the existing CESMP will be updated accordingly.

3.11 Mitigation & Management Measures, Regulations and Procedures

This Outline ESMMP recommends mitigation & management measures for the identified potential environmental and social impacts at the construction phase, as identified in the Updated ESIA Volume 2.

Design phase mitigation measures have also been recommended for consideration during the detailed design of the projects various facilities. Typically, the recommendations involve the use of pollution control technologies to minimise the environmental and social impacts.

The mitigation & management measures presented have been developed from Best Management Practices (BMP) source controls and engineering controls.

It will be noted that the measures outlined in the relevant chapter of the Updated ESIA (Volume 2) will also be implemented in addition to the ones listed in the following sections.

The overall effectiveness of the mitigation & management measures will be assessed by site monitoring programs, which will be implemented during the construction and operation phases of the project. The monitoring activities will also be designed to evaluate the project's compliance against environmental and social guidelines.

Emergency Preparedness and Response Planning

A key plan that needs to be developed in line with the CESMP is the 'Emergency Preparedness and Response Plan'. This plan is of particular importance for the ACWA Power Zarqa CCGT project due to the location of the project in an existing industrial area of Zarqa in very close proximity to other industrial facilities, such as the Petrochemical refinery and the decommissioned Hussein TPS HFO plant.

It is understood that CEGCO have an existing emergency preparedness and response plan in place for the HTPS HFO Plant, which is likely to incorporate a significant amount of important and site/area specific detail regarding potential emergency situations. The EPC Contractors site specific Emergency Preparedness and Response plan shall be developed in co-ordination with the existing plan as a minimum. Further to this, the plan shall be consistent with any plans available locally or those in place at other facilities (i.e. where wider emergencies from the petrochemical refinery could have an impacts upon the project site).

Where potential emergencies from the proposed project may put local communities and other commerce at risk, the projects plan shall include mechanisms for notification, assistance and evacuation (if necessary) of any local areas.

The plan must include specific contact details (Site Manager, HSE Manager, Site Nurse etc.), including a contact hierarchy in case of emergency, including details of external agencies who may assist (e.g. Civil Defence, Healthcare services) in response or who should otherwise be notified (Government, NEPCO etc.).

The plan shall include mechanisms to ensure suitable and sufficient emergency response equipment is on-site for reasonably foreseeable risks, and that the personnel on-site are suitably trained in regard to using this equipment and response to the plan. The plan shall include mechanisms to ensure regular drills/training are undertaken in like with the plan specifically.

The plan shall be displayed around site, presented in inductions, included to training and implemented as required. Specifically, the plan shall include a mechanism to communicate its key points to potential stakeholders of concern off-site (e.g. local residences, industry and commerce). Methods of communication shall be consistent with the Stakeholder Engagement Plan (SEP). The Emergency Preparedness and Response Plan shall be updated periodically and reviewed at least once a year.

Associated Management Plans

The associated environmental and social management plans to be developed by the EPC Contractor to be develop as part of the Project-specific CESMP:

Table 3-2 Complimentary Plans and Procedures

Plan / Procedure
Waste Management Plan (Hazardous and Non-Hazardous Waste)
Wastewater Management Plan
Water Supply Management Plan
Noise & Vibration Management Plan
Air Emission Management Plan
Dust Management Plan
Soil & Groundwater Management Plan
Emergency Preparedness and Response Plan
Community Health Management Plan

Plan / Procedure
Workers Accommodation Management Plan
Local Recruitment and Procurement Plan
Influx Management Plan
Cultural Heritage Chance Finds Procedure
Security Plan
Contractor Management Plan
Pollution Prevention and Response Plan (Oil & Chemical Spills)
Environmental Training Plan
Transport Management Plan
Hazardous Material Storage Plan

4 OESMP REQUIREMENTS

The Operational Environmental & Social Management and Monitoring Plan (OESMP) will serve as the key tool for managing environmental and social aspects related to the operation processes of the ACWA Power Zarqa CCGT Project. The following chapter provides a framework for the preparation of the site-specific OESMP by the O&M Company. It is recommended that the OESMP be finalised, 2 months prior to the start of operations.

4.1 Operational Environmental and Social Management Plan (OESMP) Requirements

The OESMP establishes mechanisms for the identification and implementation of environmental and social protection, mitigation, monitoring and institutional measures that will be taken during the operational phase of the proposed project. Such measure will be implemented to ensure compliance to the Jordanian standards and lender requirements respective for the project. All currently applicable regulation and standards for the project are detailed in Volume 2 of the Updated ESIA.

The purpose of preparing and implementing the OESMP is to ensure necessary mitigation to manage the potential adverse environmental and social impacts associated with the operation of the proposed project to acceptable levels (or to ameliorate positive impacts).

The OESMP will also need to identity the objectives, specify the monitoring requirements and measures which will include all the parameters required to be monitored, methods, sampling locations, measurement frequency, detection limits and the threshold where corrective actions are required (see section below).

The OESMP will be site specific and clearly state what issues are of specific relevance to the site. It will need to:

- Fulfil statutory requirements;
- Highlight the applicable environmental guidelines, regulations/the legislative context;
- Highlight the agreed social and community mitigation actions and awareness programs
- Establish operational Environmental and Social Objectives;
- List the identified Environmental and Social Aspects addressed in the Updated ESIA;
- Develop and implement relevant procedures;
- Develop a programme of continuous environmental and social improvement
- Clearly specify roles and responsibilities; and
- Highlight the procedures to be considered in the event of an environmental monitoring trigger level being breached or an unforeseen impact arising.

The OESMP will also identify the operational briefing and training requirements. Training can be provided in different forms such as induction sessions, training packs detailing good practices, or 'toolbox talks'.

In addition, it is important for the OESMP to accommodate changes in conditions and respond to any need for further assessment requirements. Changes are most likely to arise if

I. A new environmental or social sensitivity is identified as a consequence of changing environmental and social conditions and more detailed survey work or
II. Changes are introduced to the installations/development design.
III. Documentation and communication protocols will also be required to be identified within the OESMP. Communication protocol will include
IV. Incident/emergency communication procedure,
V. Internal communications, external communications,
VI. Management of external/internal inquiries.

International good practice of ESMP structure details that the following items will be included: (source: Practitioner – Environmental Management Plan, Best Practice Series, The Institute of Environmental Management and Assessment, Vol. 12, December 2008):

- Introduction – including summary of the project and aim of the OESMP;
- Project team roles and responsibilities;
- Summary of procedures – to be followed in the event of an emergency or breaching of OESMP measures;
- Consents and permissions – this will provide a record of the consents with which the project is taking place;
- Environmentally and Socially significant changes – detailed procedures to be followed if any significant changes are encountered once a project commences on the ground which would result in any changes to the OESMP;
- Register of site-specific environmental actions and social initiatives – this information, forming the core of the document, will be detailed for each action/initiative; a tabular format is often used to provide clarity and ease of reference. In addition, it will include (i) a programme that indicates when measures will be implemented and (ii) monitoring with indicators– to detail monitoring equipment/methods, schedule, frequency, guidelines and regulatory compliance;
- Liaison and consultation requirements;
- Register of variation – a tabular format document to record changes to procedures, design and mitigation and the implications of these changes and authorised personnel; and
- Technical schedule – to provide further details on measures, e.g. monitoring methodologies to be followed, maps delineating boundaries/areas applicable to certain measures.

4.1.1 Procedural Mitigation Measures, Regulations and Procedure

The procedural measures during operation phase will be similar to the construction phase, but shall be specific for the operational phase. For instance, the Emergency Preparedness and Response Plan shall be aligned to operational risks, but shall implement similar mechanisms to those during construction.

Therefore, similar control techniques and mitigation & management measures will be in place to tackle such risks. These typically include the use of pollution control technologies to minimise the environmental impacts and community awareness and integration initiatives.

The mitigation & management measures presented have been developed from Best Management Practices (BMP) source controls and engineering controls.

It will also be noted that mitigation & management measures outlined in the Updated ESIA (Volume 2) will also be implemented and included in the OESMP wherever necessary.

The overall effectiveness of the mitigation & management measures will be assessed by site monitoring programs, which will be implemented during the operation phases of the project. The monitoring activities will also be designed to evaluate the project's compliance against environmental guidelines and community awareness initiatives.

5 MITIGATION & MANAGEMENT MEASURES

This chapter includes the mitigation & management measures to address the potential impacts outlined in Volume 2 of the Updated ESIA. The mitigation & management measures detailed are consistent with those in Volume 2, but indicate responsibility and timeline for implementation.

Volume 2 of this Updated ESIA outlines the specific standards that require compliance in regard to the Jordanian and lender requirements. The applicable legislation is detailed for Jordan, and where specific lender standards/guideline exist, these have also been included to the following tables.

With regards to cost, it should be noted that the majority of the recommended mitigation measures relate to integrating appropriate management strategies and work practices. Therefore very few of the proposed mitigation strategies require the purchase of additional materials or the construction of additional structures that have not been already integrated in the design and operation activities.

5.1 Air Quality and Emissions

The following table provides the suggested mitigation & management measures for the construction and operation phase. However, the information provided in the respective impact assessment chapters will also be consulted for the preparation of the CESMP and OESMP.

Table 5-1 Air Quality Mitigation & Management Measures – Construction Phase

Issue	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Dust Generation	A visual assessment of dust emissions will be undertaken on a daily basis and actins taken to reduce emissions, where they are identified as excessive.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Air Protection Regulation No. 28 for 2005 Jordan Institution for Standards and Metrology (JISM) JS 1140-2006 Ambient Air Quality IFC EHS General Guidelines Ambient Air Quality	EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Vehicle speeds will be restricted to 20Km/h on haul roads and un-surfaced areas of the site.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	No burning of wastes will be allowed on site throughout the construction phase.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Regular wetting down of haul roads by water trucks.		EPC and Subcontractor	Several times a day	As soon as the works start and throughout construction period.
	Minimise vehicles and plant movements over unsealed roads. Establish paved/tarred access roads in order to minimise dust.		EPC and Subcontractor	Several times a day	As soon as the works start and throughout construction period.
	Where sand and other dusty materials are transported to the site, trucks will not be overloaded and will be appropriately covered / sheeted to avoid loses en-route.		EPC and Subcontractor	Several times a day	As soon as the works start and throughout construction period.
	Any aggregate or dusty material stockpiles will be stored in enclosed structures. Alternatively temporary piles can be covered with impervious sheeting.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Avoid or minimize excavation activities on windy days. Earthworks will be stopped when high winds are present (15 km/h).		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Re-vegetate areas, as soon as they are permanently cleared of the temporary lay down.		EPC and Subcontractor	As needed	As soon as the works start and throughout construction period.
	Contractor vehicles are to access site on dedicated constructed tarmac road to project site to avoid impact		EPC and Subcontractor	Daily	As soon as the works start and throughout

Issue	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
	on local traffic to neighbouring residential areas				construction period.
	Dust generating activities such as stone cutting and grinding are to be undertaken away from the site boundaries and/or should be effectively screened.		EPC and Subcontractor	As needed	As soon as the works start and throughout construction period.
	Powdery materials (e.g. cements) will be stored and transported in sealed containers.		EPC and Subcontractor	As needed	As soon as the works start and throughout construction period.
	The provision of a wheel-washing facilities or high-pressure hose to ensure all vehicles leaving the site are in a satisfactory state of cleanliness. Note: Dry wheel cleaning is recommended, unless adequately treated water can be reused.		EPC and Subcontractor	As needed	As soon as the works start and throughout construction period.
Exhaust Emissions	Regular maintenance and inspection for all construction plant, vehicles and vessels (to be documented and checked by site supervisor's representative).		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Routinely check equipment for smoky exhausts, and recommend appropriate corrective actions.		EPC and Subcontractor	Daily check	As soon as the works start and throughout construction period.
	Implement energy reduction practices in the operation of the vehicles and ensure that exhaust function correctly		EPC and Subcontractor	Daily	Cost should be integrated into the contract.
	Smoky equipment to be given defect notices until repaired and approved for re-deployment by site supervisor.		EPC and Subcontractor	As needed	As soon as the works start and throughout construction period.
	Modern machinery, with adequate emission control equipment will be used.		EPC and Subcontractor	As applicable	Cost should be integrated into the contract.
	Suitable fuels will be used for construction machinery, vessels and vehicles (particularly low sulfur diesel).		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Trained personnel will operate machinery properly and efficiently.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Minimise idling of construction machinery, maximise efficiency of trip times.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Plant maintenance will be carried out off-site in		EPC and	Daily	As soon as the works

Issue	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
	appropriate premises, unless in emergency situations, to contain a spill.		Subcontractor		start and throughout construction period.
	Construction roads in the site will be designated and made clear to the drivers with signage for directions and speed limits placed all along the roads.		EPC and Subcontractor	As Needed	As soon as the works start and throughout construction period.
	Deliveries of equipment/plant to the site will be efficiently managed to reduce the number of trips.		EPC and Subcontractor	As Needed	As soon as the works start and throughout construction period.
	Exhaust fumes and particulates emitted from trucks and vehicles will be minimised by assuring the use of good condition vehicles. Vehicles entering the site for the first time will be inspected for their worthiness and where necessary will not be permitted to enter the site.		EPC and Subcontractor	As Needed	As soon as the works start and throughout construction period.
Volatile Emissions, Odours	Volatile fuels and chemicals will be in sealed containers. On site storage of large quantities of volatile fuels will be avoided, equally prolonged exposure to direct sun and heat will be avoided.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Chemical storage areas will be purpose built and well maintained. A data log of all chemicals with MSDSs will be provided at the storage facility within easy access.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Pump out any stagnant waters from excavations.		EPC and Subcontractor	As needed	As soon as the works start and throughout construction period.
	Adequate and sufficient sanitary facilities for site workers must be provided. The placement of the facilities should be downwind of residential areas and should be regularly maintained.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.

Table 5-2 Air Quality Mitigation & Management Measures – Operational Phase

Issue	Mitigation Measure	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Power Plant Emissions	The Gas Turbines will be equipped with a Low NOx Combustion System, which will ensure a high quality of combustion to reduce the generation of NOx.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Air Protection Regulation No. 28 for 2005 Jordan Institution for Standards and Metrology (JISM) JS 1189-2006 – Maximum Allowable Limits of Pollutants from Stationary Sources JS 1140-2006 Ambient Air Quality IFC EHS Guidelines – Thermal Power Plants Air Emissions Ambient Air Quality European Commission EC Industrial Emissions Directive	EPC to Install, O&M to maintain	N/A	Installed at Construction. Maintained throughout operation period.
	During commissioning, the stack emissions will be tested for NO_2, SO_2, PM_{10} and CO to ensure that the control systems are operating correctly and that emission values comply with Jordanian, EU IED and IFC EHS standards/guidelines.		O&M	During Commissioning	As soon as the operation starts and throughout operation period.
	During operation there will be continuous monitoring of stack emissions, by CEMS systems particularly NOx, SO2, CO, and PM_{10}, to ensure compliant conditions are maintained through appropriate process controls. In addition the monitoring of other stack parameters such as oxygen, and temperature will also ensure that the plant is operated efficiently to maintain compliance with the specified air emission standards		O&M	Continuous	As soon as the operation starts and throughout operation period.
	Regular scheduled maintenance activities will be undertaken to ensure that equipment is operating in its most effective manner, to reduce emissions.		O&M	As required	As soon as the operation starts and throughout operation period.
Fugitive Emissions	Fugitive emissions from the plant will be controlled by an inspection and maintenance programme that will be detailed within the OESMP developed at the start of operations.		O&M	Monthly (minimum)	As soon as the operation starts and throughout operation period.
	Back up fuel storage tanks will be equipped with vapour recovery systems to ensure that any volatile vapour loses to the air are recovered and input to the tank as liquid.		EPC to Install, O&M to maintain	N/A	Installed at Construction. Maintained throughout operation period.

5.2 Noise and Vibration

The following two tables provide the suggested mitigation & management measures for the construction and operation phase. However, the information provided in the relevant impact assessment chapter will also be consulted for the preparation of the OESMP and CESMP.

Table 5-3 Noise and Vibration Mitigation & Management Measures – Construction Phase

Issue	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
Construction Noise and Vibration	The EPC contractor and their sub-contractors will, at all times, carry out all work in such a manner as to keep any disturbance from noise and vibration to a minimum.	Ministry of Environment: Environmental Protection Law No. 52 of 2006 Instruction for Reduction and Prevention of Noise for 2003 IFC EHS General Guidelines Noise Guidelines	EPC and Subcontractor	Daily Observations	As soon as construction starts and throughout construction phase.
	Activities emitting the highest noise levels will be undertaken during daylight hours between Sunday and Thursday and not during official holidays. In addition, as per the "Instruction for Reduction and Prevention of Noise for the year 2003" highest noise level construction activities should not be undertaken between 8pm and 6am.		EPC and Subcontractor	As required	As soon as construction starts and throughout construction phase.
	Where possible, the highest noise emitting activities should be undertaken in a central site area, or within an enclosed structure. For example, fabrication of materials before moving to other areas.		EPC and Subcontractor	As Required	As soon as construction starts and throughout construction phase.
	All operatives will receive training in regard to the impacts of noise, methods to reduce noise on site, and this will be further indicated in tool box talks.		EPC and Subcontractor	Monthly	As soon as construction starts and throughout construction phase.
	Diesel engine vehicles and compression equipment will be equipped with effective silencers.		EPC and Subcontractor	Monthly	As soon as construction starts and throughout construction phase.
	Electrically powered plant will be preferred, where practicable, to mechanically powered alternatives. All mechanically powered and pneumatic plant should be fitted with suitable silencers.		EPC and Subcontractor	As Required	As soon as construction starts and throughout construction phase.
	Where necessary, bored piling techniques will be preferred to impact piling. Where vibratory piling techniques are required, as modern vibrating hammer will be used.		EPC and Subcontractor	As Required	As soon as construction starts and throughout

Issue	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
					construction phase.
	Delivery vehicles will be prohibited from waiting outside the site with their engines running. The movement of heavy vehicles during the night will be avoided wherever practical.		EPC and Subcontractor	As Required	As soon as construction starts and throughout construction phase.
	All construction plant will be maintained and operated according to the manufacturers recommendations, in such a manner to avoid causing excessive noise.		EPC and Subcontractor	Daily	As soon as construction starts and throughout construction phase.
	Items of plant on site operating intermittently will be shut down in the intervening periods between use.		EPC and Subcontractor	As Required	As soon as construction starts and throughout construction phase.
	Where appropriate, noise barriers /attenuation to be employed (e.g. for generators) to ensure that the maximum noise level at 1m distance from a single source will not exceed 85dB(A).		EPC and Subcontractor	Daily	As soon as construction starts and throughout construction phase.
	Where noise levels exceeds 85dB(A) noise protection devices will be provided to personnel on-site.		EPC and Subcontractor	As Required	As soon as construction starts and throughout construction phase.
	Notices and letters should be provided to local residents, informing them of working hours and any activities that will potentially cause excessive noise and /or vibration, as per the SEP. Including key activities of these and what measures are being taken to reduce such impacts.		EPC and Subcontractor	As Required	As soon as construction starts and throughout construction phase.

Table 5-4 Noise and Vibration – Mitigation & Management for Operation

Issue	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
Operational Noise	All equipment has been specified to limit near field noise to 85dBA at 1m.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Instruction for Reduction and Prevention of Noise for 2003 IFC EHS General Guidelines Noise Guidelines	EPC to ensure, O&M to maintain	Monthly	As soon as operation starts and throughout operational phase.
	Where noise levels are found to be in exceedance of 85dB(A), noise insulation should be considered within building structures, or noise barriers should be provided.		O&M	As and When Required	As soon as operation starts and throughout operational phase.
	Silencer performance specifications will be provided to allow the plant to maintain compliance with the noise limits during unit start-up.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	The steam turbines will be provided with a soundproofing enclosure to ensure noise is below 85dB(A) at 1m.		EPC to ensure, O&M to maintain	Monthly	As soon as operation starts and throughout operational phase.
	The ACC's have been designed to include specific low noise fans.		EPC to ensure, O&M to maintain	As and When Required	Installed during construction and maintained during operation
	Installation of 10m noise barrier to the north of the power block.		EPC to ensure, O&M to maintain	n/a	Installed during construction and maintained during operation
	Deliveries of materials and removals of waste are to be undertaken during daylight hours where possible.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	Operational noise monitoring at selected local sensitive receptors will be undertaken during operation to monitor compliance to the relevant standards and guidelines. Where non-compliant levels are identified (as a result of the proposed project) – (i.e. above the standard or >+3dB(A) from baseline), consideration will be given to the further application of practical mitigation & management measures at the site itself, or at the receptor location.		EPC (during Commissioning), O&M during Operation	Monthly	As soon as operation starts and throughout operational phase.

5.3 Soil, Geology and Groundwater

The following table provides the suggested general mitigation & management measures for the two project phases. Therefore, the information provided in the relevant impact assessment chapter will also be consulted for the preparation of the CESMP and OESMP.

Table 5-5 Soil, Geology and Groundwater Mitigation & Management – construction phase

Impact	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
Spillage/ Leakage	All permanent or semi-permanent hazardous materials storage areas must have suitable leak tight bunding, to contain 110% of the total stored volume, in the event of a spill or leakage.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Soil Protection Regulation No. (25) of 2005	EPC and Subcontractor	Upon installation of all tanks	Throughout construction phase
	Spill Prevention and Spill Response Plans will be established. The plans will outline methods for the prevention of incidents, response and remediation of any contamination. Where appropriate for applicable risks, this should be consistent with the sites Emergency Preparedness and Response Plan.		EPC	n/a	Prior to start of construction
	The clean up of any spillage or leakage will be made by spill absorbents, available at all fuel, hazardous material and hazardous waste storage locations on the site. Absorbents and other clean up material/provision will be contained within accessible and clearly marked spillage kits. Training on spillage response will be provided to site personnel, and will be covered in tool box talks.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	Refuelling of equipment and tanks (e.g. in laydown areas) will only be conducted in designated areas following specified procedures, and not at the working locations to minimise potential spillages.		EPC and Subcontractor	Daily Observations	Throughout construction phase
Cross contamination of soils	Identified contamination at the power block area is in the process of being remediated and will be completed pending permit approval by MoE.		EPC	Analysis of soil quality post mitigation	Prior to end of June 2016
	Implementation of good housekeeping practices during construction activities including procedures and requirements for proper handling, storage, and transport of hazardous materials and waste.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	If contaminated soils are observed during construction activity, the identified contaminated soil should be excavated separately, and stored or disposed of in accordance with environmentally		EPC and Subcontractor	Daily Observations	Throughout construction phase

Impact	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
	adequate measures for waste management, to avoid cross-contamination.				
	Contaminated aggregate wastes or excavation material will be disposed through licensed waste contractors at licensed hazardous waste landfill facilities, regulated by the Ministry of Environment.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	Washing of equipment, machinery and vehicles will only be permitted in designated areas, with impermeable surfaces and separate drainage systems that lead to separate treatment facilities and/or lined evaporation ponds. The use of evaporation ponds will require the removal of sludge residues as solid hazardous waste by a licensed waste contractor.		EPC and Subcontractor	Daily Observations	Throughout construction phase
Storage and waste management	Develop a Project-specific Waste Management Plan as part of the CESMP. Implementation of management measures to be monitored as follows:		EPC Contractor	-	Throughout construction phase
	All hazardous materials or waste being temporarily used or otherwise stored outside of its designated storage areas should be kept in well-equipped, leak-tight containers with drip protection to avoid leaks to the ground.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	Wherever possible, the EPC and sub-contractors will reduce the quantity of chemicals and fuel stored on site to minimum practical level. Infrequently used chemicals should be ordered in suitable quantities only when required.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	Excavated materials will be kept in the stockpiles for as short a time as possible.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	No hazardous materials are to be stockpiled.		EPC and Subcontractor	Daily Observations	Throughout construction phase
	The EPC contractor and sub-contractors will provide training relating to the management, transportation and handling of hazardous materials and wastes – in line with any procedures developed to guide the on-site management of such activities.		EPC and Subcontractor	Daily Observations	Throughout construction phase

Table 5-6 Soil, Geology and Groundwater Mitigation & Management – operational phase

Impact	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
Spillage/ Leakage	The liquid fuel tanks, and all chemical/hazardous material and liquid storage tanks will be afforded impermeable bunded protection. Bunds will contain 110% of the maximum volumetric tank capacity.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Soil Protection Regulation No. (25) of 2005	EPC to install, O&M to maintain	Leakage checks as required	At construction & monitored during operation
	All drainage systems within bunded areas will be separated and will be directed to the oily wastewater, or chemical wastewater treatment facilities as per the contents type.		EPC to install, O&M to maintain	n/a	At construction
	In general, the site will be hard standing. This will reduce pollution pathways to soils and groundwater in the event of spillage.		EPC to install, O&M to maintain	General observations	At construction & monitored during operation
	Leakage monitoring systems will be installed on key tanks (e.g. fuel oil and any large chemical tanks) in order to determine leaks at an early stage.		EPC to install, O&M to maintain	Continuous	Throughout Operation
	Spill kits and clean up materials will be well located and visible in key areas of the site (e.g. chemical stores and close to any fuel storage areas). Larger provisions for spill clean up and control should be available in the event of significant spills.		O&M	Weekly	Throughout Operation
Storage and Waste Management	Effective waste management as per the waste management mitigation will be implemented through a site specific waste management plan/ The WMP will include measures to limit instances of contamination to soils and groundwater.		O&M	Daily Observations	Prior to and throughout operation
	Hazardous waste storage areas will be well constructed with impermeable bunded protection to soils, separate drainage system and a rain shelter to avoid any potential instance of runoff, or leakage of runoff.		EPC to install, O&M to maintain	n/a	Prior to and throughout operation
Landscaping additives: TSE, Fertiliser and Pesticide Application	If used in landscaped areas, the application of fertilisers and pesticides must be limited and monitored; • Use of any toxic/non biodegradable pesticides will be prohibited in accordance with the Stockholm Convention on banned chemicals; • Only organic, chloride free and environmentally friendly fertilizers should be applied. DDT must not be used due to its listing as a banned chemical (re:		O&M	As required	Throughout Operation

Impact	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
	Stockholm Convention for a full lists of POPs).				
Storm water Management	Oily storm water from the fuel storage areas, fuel unloading areas and other potential areas of oils open to rainfall will be directed to the on-site oil water separator for treatment, prior to entering the evaporation pond.		EPC to install, O&M to maintain	n/a	At construction, maintained throughout operation
	Site drains for stormwater shall include built in traps for oils and greases. Stormwater after treatment and achieving Jordanian and IFC applicable limits will be discharged into the wadi.		EPC to install, O&M to maintain	n/a	At construction, maintained throughout operation
Pollution Pathway - Boreholes	In regard to the design of the new wells, it is understood that the wells will be suitably lined with impermeable materials (as per the applicable building codes) to ensure that the risks of such pathways are minimised.		EPC to install, O&M to maintain	n/a	At construction, maintained throughout operation
Abstraction impacts to groundwater quality	Groundwater abstractions from the new water wells will be minimised through re-use of treated wastewater for irrigation on site.		O&M	Daily during pumping of groundwater	As required

5.4 Water and Wastewater

The following two tables provide the suggested mitigation & management measures for the construction and operation phase.

Table 5-7 Water and Wastewater Mitigation & Management Measures – Construction Phase

Subject	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Water resources	The most suitable source of water will be identified by the EPC Contractor for each required water stream (e.g. drinking water, water for construction, water for road wetting). Where appropriate available local water resources will be identified, to reduce the additional transportation requirements of water from greater distances. However, it is of primary importance that the supply of water is from a source, which will not deprive any population/habitat its necessary water requirements, or will lead to depletion in such water resources.	Ministry of Water and Irrigation Water Authority Law No. 18 for 1988 and its amendments thereof Groundwater Control Regulation No. 85 for 2002 and its amendments thereof Instructions for the Protection of Water Resources Allocated for Drinking Purposes for 2006 Ministry of	EPC Contractor	As required	Prior to start of construction
Sanitary wastewater	Toilet blocks with in built septic tanks will be installed on site and at the labour accommodation and administration buildings. The septic tanks will be above ground where possible, though if buried will be placed in secure areas, away from general vehicle traffic, in order to prevent any damage to the tanks.		EPC and Sub-Contractors	As required during Installation of septic tanks	Throughout construction
	The number of toilet blocks and septic tanks will be increased in proportion to the increased number of workers on site.		EPC and Sub-Contractors	As required	Throughout construction
	No treated or untreated sanitary wastewater shall be discharged on site or directly to areas off site, e.g. the adjacent wadi.		EPC and Sub-Contractors	General	Throughout construction
	Site inspections will be carried out regularly by the EPC contractor to ensure that all wastewater generated is properly managed, and no leakages or spill over occur. In the event of a spill or overflow, immediate action will be taken in accordance with spill containment procedures and clean up procedures (to be developed in line with the CESMP).		EPC	Daily	Throughout construction
	In common with the IFC EHS Guidelines, effort will be made in training construction personnel to minimise water consumption for ablutions and to ensure an understanding of water resource and wastewater issues.		EPC and Sub-Contractors	Periodic Training	Throughout construction
	Prior to demobilisation from the construction site, the EPC contractor will develop procedures for the removal of septic tanks to ensure that contamination to the site or accommodation area does occur		EPC	n/a	Before the first septic tank is removed

Subject	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
	during the demobilisation period.	Health Public Health Law No. 47 for 2008 Jordan Institution for Standards and Metrology (JISM) JS 202-2007 Water: Industrial Reclaimed Wastewater JS 893-2006 Water: Reclaimed Domestic Wastewater			
Construction Wastewater	Oily wastewater (e.g. from hydro testing and steam cleaning) will be treated via interceptors, or the on-site oil/water separator or a temporary modular wastewater treatment plant to be provided by the EPC Contractor. A specialist contractor will remove the recovered oil for recycling. Any residual sludge will be taken to a local Municipality hazardous waste landfill.		EPC and Sub-Contractors	n/a	Throughout construction
	A dedicated area for vehicle and machinery maintenance (lubrication, oil and filter changes, repair work, etc.) will be provided on site. This is to include an impermeable surface and side bund/gutter collection.		EPC and Sub-Contractors	n/a	Prior to construction and setting up of new laydowns
	Storage of any wastewater arising from construction activities (e.g equipment and vehicle maintenance) in areas adjacent to the Wadi shall be avoided.		EPC	General observations	Construction planning
	Consideration should be given to the construction of a settlement basin to retain water until it particles have settled. Wastewater from the cleaning of concrete trucks that could include cement and concrete waste should be directed to this basin. The water part can be used for wetting down of unpaved roads, stockpiles and excavations. regular removal of sludge. Treated effluents that cannot be re-sued on site, must be taken to the authorised disposal point without the entrainment of soil, material or any other substance that could contaminate them.		EPC	n/a	Prior to construction
	Following the completion of construction, all wastewater storage provisions and containment systems must be duly dismantled. The dismantling shall include the final drainage of any existing water and sludge, removal of impermeable linings, filling of any excavated pits and assurance that the land is re-instated to its initial state. All excess products must be taken to an appropriate waste management facility for treatment/disposal.		EPC and Sub-Contractors	As required	Throughout construction
	Measures to minimise water use during commissioning, such as recycling shall be implemented by the contractor. These include re-use of the hydro-testing water, until this phase of testing is completed and the water is no longer serviceable. Subsequently, the		EPC and Sub-Contractors	As required	Throughout construction

Subject	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
	wastewater will be sent to the evaporation pond.				
Flooding, Erosion, Siltation	Water flow will be channelled to limit run-off The site will be fenced to ensure that no soil disturbance occurs outside of the site area. Reduce height of embankments and slopes Recover vegetation on slopes and embankments From the outset of work, plan, select and define areas for clearing, stripping and access routes in order to minimise unnecessary stripping of vegetation. Reduce cut-offs and embankments.		EPC and Sub-Contractors	General observations	Throughout construction

Table 5-8 Water and Wastewater Mitigation & Management Measures – Operational Phase

Subject	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Plant Wastewater Management	Oily wastewater will be treated via an oil/water separator. A specialist contractor will remove the recovered oil part for recycling. Any residual sludge will be taken to a Municipality hazardous waste landfill.	Ministry of Water and Irrigation Water Authority Law No. 18 for 1988 and its amendments thereof Groundwater Control Regulation No. 85 for 2002 and its amendments thereof Instructions for the Protection of Water Resources Allocated for Drinking Purposes for 2006 Ministry of Health	EPC to install, O&M to maintain	n/a	At construction, maintained throughout operation
	Any above ground tanks and basins will have overflow pipes to an impermeable effluent collection point (i.e. evaporation pond).		EPC to install, O&M to maintain	n/a	At construction, maintained throughout operation
	Wastewater collection systems and oil water separators shall be inspected frequently, to ensure that no blockages could result in overflowing.		O&M	Daily	Throughout Operation
	Sludge from all treatment systems will be disposed in accordance with Jordanian, EBRD and IFC regulations for the hazardous wastes.		O&M	As required	Throughout Operation
Storm water Management	Waste management areas shall be designed in such a way that any runoff does not have a pathway to the soils, groundwater or external wadi.		EPC to install, O&M to maintain	n/a	At construction, maintained throughout

Subject	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
		Public Health Law No. 47 for 2008 Jordan Institution for Standards and Metrology (JISM) JS 202-2007 Water: Industrial Reclaimed Wastewater JS 893-2006 Water: Reclaimed Domestic Wastewater			operation
Raw Water Consumption	In common with the best practices, effort will be made in training employees including all sub-contractors at the site to minimise water consumption and ensure an understanding of wastewater issues.		O&M	n/a	Throughout Operation
	The project will not discharge process wastewater streams. For which several treated process streams will be re-used on site to minimise water consumption.		O&M	Annually	Throughout Operation
	Mechanisms and management practices to further reduce the volume of water required in the plant (e.g. increased reuse rates of treated effluent) will be considered, as this would help decrease freshwater consumptions.				

5.5 Solid and Hazardous Waste Management

The following table provides the suggested general Mitigation & Management for the two project phases. Therefore, the information provided in the relevant impact assessment chapter will also be consulted for the preparation of the CESMP and OESMP.

Table 5-9 Waste Management Mitigation & Management – Construction

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
Solid waste volumes/ quantities	Waste concrete and masonry can be re-used in road construction and base fillings; reasonable levels of utilisation is 80 to 90%	Ministry of Environment Environmental Protection Law No. 52 of 2006 Solid Waste Management Regulation No. (27) of 2005 Management, Transportation, & Handling of Harmful & Hazardous Substances Regulation No. (24) of 2005, Instruction for Management and Handling of Consumed Oils for 2003,	EPC and Subcontractor	As required	As soon as the works start and throughout construction period.
	The amount of waste timber generated can be reduced through ensuring accurate measurements and orders are placed, and re-use for general construction purposes. It is estimated that 50 to 60% of this waste stream could be re-used		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	Waste metal can readily be recycled, 100% of this waste stream can be eliminated, through sale to local scrap metal dealers		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	It is conservatively estimated that 80% of oils can be refurbished or reused through energy recovery		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	Ordering materials that have reusable packaging and/or in bulk can significantly reduce waste generated		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	Suppliers will be requested to use minimal packaging. Chemicals will be ordered in returnable drums. "Buy-back" arrangements will be made with key suppliers so that any surplus chemicals or materials can be returned;		EPC and Subcontractor	As required	As soon as the works start and throughout construction period.

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
	Refillable containers will be used, where possible, for collection of waste fluids such as waste oil, hydraulic oils, and used grease.	Instruction for Hazardous Waste Management for the year 2003 Jordan Institution for Standards and Metrology (JISM) Jordanian Standard 431/1985 – General Precautionary Requirements for Storage of Hazardous Materials	EPC and Subcontractor	As required	As soon as the works start and throughout construction period.
Housekeeping	Separation of waste streams to facilitate recycling		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	Adequate storage facilities for non-hazardous waste storage in designated areas to prevent waste from dispersing throughout the site		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Adequate hazardous waste storage in bunded containers stored in dedicated, covered storage areas with impermeable bases, sufficient containment capacity and equipped with spill kits		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Immediate spill response protocol and contingency plans to detail the clean up of any spillages		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	Procedures and rules for hazardous waste handling		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
	Mandatory training program for employees to increase their awareness of waste management protocols including proper handling and storage of waste, and emergency response and contingency plans.		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
Waste Storage	Food waste must be stored within a sealed metal or plastic skip or bin, in order to prevent vermin/pests gaining access;		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Lightweight waste e.g. paper, cardboard, plastics: Must be stored		EPC and	Daily	As soon as the works

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
	within a skip sealed with a secured tarpaulin/netting sufficient to prevent any material being dispersed.		Subcontractor		start and throughout construction period.
	Hazardous waste must be contained within impermeable containers with sufficient containment to prevent any spills. Storage containers will be bunded where necessary. The bunded base will have the capacity to contain 110% of the total volume of stored materials. This area must be placed away from any sources of ignition.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	All storage areas must be well organised and waste appropriately managed through segregation of hazardous and non-hazardous waste. Waste within each category will be further segregated by type (paper, plastic, metal) and whether the material is recyclable or non-recyclable. Construction waste will be separated into combustible and non-combustible, and all flammable substances must be kept away from sources of ignition.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	For litter (food waste, domestic waste), an adequate number of bins will be placed throughout the site at locations where construction workers and staff consume food. These will be regularly collected and taken to the main waste storage area. On-going housekeeping training will be provided to all staff on the importance of the need to avoid littering.		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Waste containers will be clearly marked with appropriate warning labels to accurately describe their contents and detailed safety precautions. Labels will be waterproof, securely attached, and written in English and Arabic. Wherever possible, chemicals will be kept in their original container		EPC and Subcontractor	Daily	As soon as the works start and throughout construction period.
	Waste generated during construction will only be transported off-site for disposal by an appropriately licensed vendor at a hazardous waste landfill facility, regulated by the Ministry of		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
	Environment. This contractor will follow the proper protocols to ensure that all waste handling and disposal from the site is carried out according to accepted environmental regulations. A record for all streams of generated waste will be kept onsite by EPC. This will be readily available for MoE or concerned authority				
	Regular training of site personnel in proper waste management and chemical handling procedures will be conducted at regular intervals.		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.
Hazardous Waste	Implement best practice and regulations procedures for adequate handling, establishment of secure temporary storage areas, and disposal of waste by approved contractors.		EPC and Subcontractor	Monthly	As soon as the works start and throughout construction period.

Table 5-10 Waste Management Mitigation & Management – Operation

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
Waste Volumes and Hazardous Wastes	Segregation and storage of different types of waste in separate labelled containers, to promote the re-use and/or recycling of materials. Use high quality raw material to reduce the quantities of waste generated.	Ministry of Environment Environmental Protection Law No. 52 of 2006	O&M	Monthly	As soon as operation starts and throughout operational phase.
	Reduce packaging of materials and order in bulk. If appropriate, request supplier to minimise packaging. Recycle paper, metal, plastic and packaging.	Solid Waste Management Regulation No. (27) of 2005	O&M	Monthly	As soon as operation starts and throughout operational phase.
	Implement a recording system for the amount of wastes generated on-site.	Management, Transportation,	O&M	Monthly	As soon as operation starts and throughout

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
		& Handling of Harmful & Hazardous Substances Regulation No. (24) of 2005, Instruction for Management and Handling of Consumed Oils for 2003, Instruction for Hazardous Waste Management for the year 2003 <u>Jordan Institution for Standards and Metrology (JISM)</u> Jordanian Standard 431/1985 – General Precautionary Requirements for Storage of Hazardous Materials			operational phase.
	Undertake regular inspections, audits, and monitoring of waste streams generated to ensure that all necessary mitigation measures are being implemented.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	Waste solvents, oils and other hazardous materials used at the site will be collected in suitably bunded and protected areas and reused where possible. Used lubrication oils are particularly suitable for re-use and it is understood that a number of suitable facilities exist in Jordan, although it is not known whether one is in the vicinity of the Project site. Such waste will be collected and transported by appropriately licensed transporters to hazardous waste landfill facilities, regulated by the Ministry of Environment.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	Consignment details and records of the hazardous waste generated shall be maintained in the facility.		O&M		As soon as operation starts and throughout Monthly operational phase.
	Waste disposal records and details of disposal locations will be maintained and kept on site to ensure that all waste streams (non-hazardous and hazardous) are disposed of in an appropriate way.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	Only trained personnel will be permitted to handle hazardous waste.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	Implementation of spillage and leakage prevention measures such as a development of manuals for proper waste handling, regular inspection of containers and storage areas.		O&M	Monthly	As soon as operation starts and throughout operational phase.
	General household and domestic waste generated by Project		O&M	Monthly	As soon as operation

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Implementation Schedule
	staff will be stored in area clearly marked. Separate colour coded and labelled waste bins will be installed at different locations throughout the Project site.			Monthly	starts and throughout operational phase.
	Mandatory training program for employees to increase awareness of waste management including proper waste; Training and orientation on waste minimisation, segregation and proper good housekeeping practice at the beginning of work and at regular interval will be conducted.		O&M		As soon as operation starts and throughout operational phase.

5.6 Biodiversity Conservation

The following tables provide general mitigation measures for the two project phases. Therefore, the information provided in the relevant impact assessment chapter will also be consulted for the preparation of the CESMP and OESMP.

Table 5-11 Biodiversity Conservation Mitigation & Management Measures – Construction Phase

Impact/ Source	Mitigation Measure	Applicable Legislation	Responsibility	Monitoring	Schedule
Direct Loss of habitat	In line with EBRD/IFC PR/PS 6 regarding biodiversity conservation, the loss of native vegetation should be offset through corresponding re-vegetation of the site. Any required offset for vegetation should use native or naturalised species. Alien species will not be introduced.	Ministry of Environment: Environmental Protection Law No. 52 of 2006 Ministry of Agriculture Agriculture Law No. 44 of 2002 Regulation for Categorizing Wild Birds and Animals Banded from Hunting No.43 of 2008	EPC Contractor	As required (at the end of construction)	CESMP – Planning: During the completion of construction
	The laydown areas of the site will be minimised in size wherever possible, and preferably located in an area with little or no vegetation.		EPC Contractor	General Observations	CESMP – site preparation
	Hazardous materials used during the construction stage will be adequately managed, in order to minimise the potential risk of spillage and therefore potential contamination of the habitats.		EPC Contractor	Daily Observations	CESMP – Management and training throughout construction
Loss of Seedbank	To aid re-vegetation, the topsoil (containing the most nutrient rich soils) will be removed and stored safely and spread over the site once construction has been completed.		EPC Contractor	As required	CESMP -Planning and removal of soils during initial earthworks
Noise impact on fauna	Construction noise mitigation as per the noise section to be applied		EPC & Sub-Contractors	Daily Observations	CESMP -Throughout Construction

Table 5-12 Biodiversity Conservation Mitigation & Management Measures – Operational Phase

Impact/ Source	Mitigation Measure	Applicable Legislation	Responsibility	Monitoring	Schedule
Provision of Landscaping	In line with EBRD/IFC PR/PS 6 regarding biodiversity conservation, the loss of native vegetation should be offset through corresponding re-vegetation of the site. Any required offset for vegetation should use native or naturalised species. Alien species will not be introduced.	Ministry of Environment: Environmental Protection Law No. 52 of 2006 Ministry of Agriculture Agriculture Law No. 44 of 2002 Regulation for Categorizing Wild Birds and Animals Banded from Hunting No.43 of 2008	O&M to manage and maintain	General Observations	OESMP – Throughout Operation
	Intentional replanting of vegetation and incidental recolonisation with native species from the seeds retained from the stockpiling of topsoil would enhance the biodiversity of the site as well as improve the visual aesthetics of the site. Areas used for laydown and storage will be scarified if compacted, in order to facilitate the recolonisation of native species;		O&M to manage and maintain	As required	OESMP – Throughout Operation
Pests from domestic waste	Implement a pest control plan, including measures to deter pests (e.g. suitable containment of wastes, as per waste mitigation)		O&M	As required	OESMP - Throughout Operation
Landscaping Additives	Use of landscaping additives such as fertilisers and pesticides will be avoided where possible or otherwise minimised. Banned chemicals under the Stockholm Convention (POP's) will not be permitted on-site.		O&M	General Observations	OESMP – Planning, design, monitoring
Wastewater Discharge	The project will ensure wastewater treatment to an appropriate level with frequent monitoring of water quality. All other wastewater shall be suitably contained or otherwise managed. This includes storm water which may become contamination by any hazardous surface residues.		O&M	Weekly (minimum) for irrigation quality	OESMP – Planning, design, monitoring

5.7 Social & Economic

Table 5-13 Social & Economic Mitigation & Management – Construction phase

Issue	Mitigation Measure	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Population Influx	Population influx will be minimised where possible by employment of local sub-contractors and populations at the construction phase. The projects recruitment policy will ensure a preference for local workers where suitable applicants and local companies are available.	n/a in Jordan Project is to comply with EBRD PR's and IFC PS's, both of which include considerable references to social aspects	EPC & Sub-Contractors	As required	Throughout construction
	First Aid facilities and clinic room will be available to construction personnel on-site. This will reduce demand upon existing local services in regard to the additional population during construction.		EPC	n/a	Throughout construction
Employment Opportunities	The HR Policy will be prepared to ensure consistency in line with local labour laws, IFC/EBRD PS2/PR2 and international ILO and UN conventions. The EPC Contractor is to ensure that this is applied as an overarching policy for all sub-contractor company HR policy as part of their contractual arrangements in line with the requirements of the international project lenders.		EPC	n/a	Prior to start of construction
Training and Dissemination of Skills	All project workers will receive induction training at the project, as well as vocational specific training for on-site construction works.		EPC	All training session attendees to be recorded	Throughout construction
	All workers will receive training in regard to health and safety, as well as environmental awareness.		EPC	All training session attendees to be recorded	Throughout construction
	Tool-Box talks will be conducted before work on each day to ensure workers are reminded of key topics.		EPC & Sub-Contractors	As required	Throughout construction
Education of locals	CEGCO will continue their interactions and support within the community, particularly in regards to health check ups and support for schools. All aspects will provide the opportunity for informal education and dissemination of information.		CEGCO	n/a	Throughout construction
	An information board for project related information will be erected at the project main entrance.		EPC	n/a	Prior to start of construction
	Appropriate dialogue signage and notification will communicate any key construction related events to the local communities of Hashimyah (as applicable).		EPC	As required	Throughout construction
Demand on	Use of diesel generators on-site for electrical generation.		EPC & Sub-	n/a	Throughout

Issue	Mitigation Measure	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Utilities			Contractors		construction
	Water will be sourced tankered supply, or bottled supply (for drinking).		EPC & Sub-Contractors	n/a	Throughout construction
	Site sanitary wastewater will be collected in septic tanks and removed by a licensed contractor for treatment off-site (i.e. locally at Al Samra WWTP)		EPC & Sub-Contractors	As required	Throughout construction
	Licensed waste contractors will be engaged to remove all waste from the site for re-use, recycling, recovery or disposal off-site. Note: Any hazardous waste will be disposed at landfill facilities, regulated by the Ministry of Environment.		EPC & Sub-Contractors	As required	Throughout construction

Table 5-14 Social & Economic Mitigation & Management – Operation phase

Issue	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Employment Opportunities	The projects recruitment policy will ensure a preference for local populations where appropriately skilled workers are available locally (or if unskilled positions are available).	n/a in Jordan Project is to comply with EBRD PR's and IFC PS's, both of which include considerable references to social aspects	Project Company and O&M	n/a	Prior to operation
	The HR Policy will be prepared to ensure consistency in line with local labour laws, IFC/EBRD PS2/PR2 and international ILO and UN conventions.		Project Company and O&M	n/a	Prior to operation
	It is recommended that key supply chains are monitored periodically during operations to ensure that material, goods and service providers do not employ forced or child labour, whilst ensuring the suppliers have a suitable occupational health and safety record.		O&M	Annually	Throughout operation
Training and Dissemination of Skills	All plant personnel will receive induction training at the project, as well as vocational specific training for their duties.		O&M	As required	Throughout operation
	All workers will receive training in regard to health and safety, as well as environmental awareness. Training will be updated on a yearly basis as a minimum.		O&M	As required	Throughout operation
	Workers will be encouraged to develop their careers and may be provided with opportunities to attend training courses and other career development processes.		O&M	n/a	Throughout operation

Issue	Mitigation & Management	Applicable Legislation	Parties responsible	Monitoring	Implementation Schedule
Education of locals	Appropriate dialogue signage and notification (e.g. by external notice boards) will communicate key operational related events.		Project Company and O&M	Updated as required	Throughout operation
Demand on Utilities & Services	The power plant will provide a highly significant local source of power that will provide enhanced stability to the local area in terms of electrical supply.		O&M	n/a	n/a
	The plant will re-use a significant portion of its treated process wastewater, to reduce water consumption.		O&M	n/a	Throughout operation
	Use of groundwater from the on-site wells will reduce water diversion from potable sources.		O&M	Daily monitoring of quality (when in operation)	As required during emergencies
	Service and process water will be provided from the on-site wells.		O&M	Daily monitoring of quality	Throughout operation
	Process wastewater will be treated on-site and re-used, sprayed as irrigation, or evaporated.		O&M	Daily monitoring of quality	Throughout operation
	Licensed waste contractors will be engaged to remove all waste from the site for re-use, recycling, recovery or disposal off-site.		O&M	As required	Throughout operation

5.8 Traffic and Transport

Table 5-15 Traffic Mitigation & Management – construction phase

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Increased vehicles on Highways and Local Roads	A traffic management plan will be developed to indicate designated access routes, site entrance points, waiting and parking areas etc. The plan will outline how construction traffic will be managed to limit impacts upon local communities, on-site personnel, and other road users. The traffic management plan will be developed to ensure that road safety concerns are addressed. The plan should detail what routes will be taken for any specialist deliveries (i.e. oversize vehicles). The plan needs to identify specific requirements such as any diversions required for road types, bridge capacities, weight restrictions, overhead line (if an issue) etc, as well as any required traffic management for local traffic.	Ministry of Transport Traffic Law No. 49 of 2008 Regulations for the Registration and Licensing of Vehicles No. 104 for 2008; Regulation for Maximum Dimensions, Weights and Total Engine Power for Vehicles No. 42 of 2002; Instructions for Allowable Speed Limits for 2002.	EPC and subcontractors	Monthly	As soon as the works start and throughout construction period.
	EPC staff and Labourers will be transported by buses to reduce vehicle movements and trips. Car pooling will be encouraged for all other construction staff to reduce the number of vehicles on highways and local routes.		EPC and subcontractors	As Required	As soon as the works start and throughout construction period.
	Key trips to the site, will be scheduled outside of peak traffic flow hours.		EPC and subcontractors	As Required	As soon as the works start and throughout construction period.
	Staggering key deliveries or periods of high vehicle movements to the site will ensure that additional vehicle presence on local and site roads is minimised, whilst reducing waiting times for drivers and over demand on receiving staff at the site.		EPC and subcontractors	As Required	As soon as the works start and throughout construction period.
	Designated routes will be made clear to the drivers and signs for the directions and speed limit will be placed all along the roads.		EPC and subcontractors	As Required	As soon as the works start and throughout construction period.
Delays on Local	It is expected that the contractors for the WAJ pipeline installation		WAJ Contractor	n/a	At the time of

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Schedule
roads due to water pipeline installation	will implement traffic management to ensure road safety and to regulate flows of vehicles during lane closures.				construction

Table 5-16 Traffic Mitigation & Management – Operational Phase

Impact/ Source	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Increased vehicles on local roads and highways	Wherever possible waste removal will be scheduled outside of peak periods	Ministry of Transport Traffic Law No. 49 of 2008 Regulations for the Registration and Licensing of Vehicles No. 104 for 2008; Regulation for Maximum Dimensions, Weights and Total Engine Power for Vehicles No. 42 of 2002; Instructions for Allowable Speed Limits for 2002.	O&M	As required	As soon as operation starts and throughout operational phase.
	Develop a traffic management plan which identifies preferred access routes and times for HGVs within the project. The traffic management plan should reduce impacts upon local sensitives and include measures for reducing impacts upon local communities (i.e. for safety of pedestrians and other road users).		O&M	As Required	As soon as operation starts and throughout operational phase.

5.9 Cultural Heritage and Archaeology

5.9.1 Applicable Legislation

- Department of Antiquities

Antiquities Law No. 21 of 1988 and its amendments No. 23 for 2004

5.9.2 Construction

The EPC contractor will be required to prepare a CESMP before commencing construction works, which will consider the potential for unearthing historical sites or artefacts.

The EPC contractor is expected to implement appropriate measures for chance find procedures which are standard requirements by the DoA as required by the "Antiquities Law No. 21 for 1988 and its amendments No. 23 for 2004". Those mainly require that construction activities be halted and the area fenced, while the contractor Site Manager immediately notifying the DoA. No additional work will be allowed before the Department assesses the found potential archaeological site and grants a clearance to resume the work. Construction activities can continue at other parts of the site if no potential archaeological remains were found. If found, same procedures above apply

In addition, the EPC will also be required to follow and consider the Standards and Guidelines for an Archaeological Watching Brief, Institute of Field Archaeologists, Revised Version, 2008. The Archaeological Watching Brief is a formal programme of observations and investigations that are carried out for non-archaeological projects. It can be undertaken in any site where possibilities to find any archaeological deposits exist.

Training and awareness programmes will be provided to ensure that construction staff and labourers are aware of the procedures relating to the Archaeological Watching Brief will any artefacts or anthropogenic finds be uncovered.

5.9.3 Operation

Although objects of archaeological value are not expected to be discovered during the operational phase of the project, the chance finds procedure outlined for the construction phase (as above) shall be followed and included to the site-specific OESMP.

5.10 Landscape and Visual

Table 5-17 Landscape and Visual Mitigation measure –Construction Phase

Impact	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Schedule
New features in the landscape	Where appropriate, construction laydowns and working areas on and off the site shall be screened to reduce the visual intrusion to existing off site receptors. When not in use, cranes and other construction plant hall be lowered, so they are at their minimum height and do not protrude unnecessarily within the visual envelope of local receptors.	n/a in Jordan	EPC and subcontractors	Daily	As soon as the works start and throughout construction period.
New features impacting views	Mitigation measures relating to the generation of dust (as detailed in the air quality mitigation section) shall be implemented to ensure that visual impacts are not caused through construction activities.		EPC and subcontractors	Daily	As soon as the works start and throughout construction period.
Light Pollution	Any flood lights required during night time will be directed onto the working areas, with a maximum position angle of 30° from vertical, and back spill shields, therefore minimising any unwanted light spill and impacts at night.		EPC and subcontractors	Daily	As soon as the works start and throughout construction period.

Table 5-18 Landscape and Visual Mitigation measure – Operational Phase

Impact	Mitigation Measure	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Influence on Landscape	Although the project is located within a developing industrial Zone, efforts shall be made to soften the landscape character impacts, this will include the planting of endemic vegetation in appropriate areas such as the project boundaries, to soften the landscape impacts. The noise barrier at the project site will have a transparent upper section to limit the impacts upon local visual receptors	n/a in Jordan	O&M	As required	Throughout operation
Impact of Lights	Lighting provision shall not be excessive or unnecessary. Minimise lighting intensity (lumens below 4050). Light fittings shall be directional as deemed appropriate for their use and intended areas of illumination. Lighting column and lighting head design should be chosen to limit back spill and any unwanted light spill to other site areas or, those areas off the site. Minimise illumination of building facades for aesthetic purposes. Lighting should not cause reflected glare from site buildings.	n/a in Jordan	EPC to install, O&M to maintain	As required	Throughout operation

5.11 Community Safety and Security

Table 5-19 Community Safety and Security – Selected Mitigation & Management for Construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Emergency Situations	Risks to public safety will be appropriately addressed and prepared for in the operational phase 'Emergency Preparedness and Response Plan' and training. The plan will include the appropriate procedure to respond to any such incidents, as well as site specific contact details and details of external agencies who may be required.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Ministry of Health Public Health Law No. 47 for 2008	EPC	n/a	Prior to the start of construction
	All high risk areas including fuel storage areas will be secured with internal fencing and will be patrolled by security throughout the day. Appropriate mechanisms for emergency control (e.g. fire fighting equipment) will be placed at suitable positions around the site.		EPC & Sub-Contractors	General observations	Throughout construction
Exposure to Disease	The Health and Safety teams on site will provide advice during training/inductions on exposure to disease. During construction SEPCO III plan to protect against the spread of internal and external diseases by taking the following measures: • Site personnel will only be cleared for work after with a medical fitness certificate from an authorized medical centre. • SEPCO III project staff will include a Doctor, Nurse and First aiders. The medical staff shall ensure a monitoring and health surveillance program. • Any reportable disease shall be diagnosed by the authorized occupation health centre doctor. Diagnosis includes identifying any new symptoms, or any significant worsening of existing symptoms. Any external and internal spreading diseases shall be diagnosed and taken the precautions as per the instructions from the national/ local medical authority.		EPC	General observations	Throughout construction
Security	The project will employ its own security armed staff who will provide 24*7 security control across the site and dedicated security staff at gatehouses.		EPC	Continuous	Throughout construction
	SEPCO III have confirmed that security arrangements be guided by UN Code of conducts for law enforcement officials and UN basic principles on		EPC	n/a	Throughout construction

	the use of Force and Firearms by law enforcement officials. Security personnel will follow a strict code of conduct and will be trained in weapons handling, human rights and receipt of grievances.				
	The project will be fenced prior to construction including internal fencing to segregate the project areas from the existing HTPS HFO plant.		EPC	n/a	Prior to the start of construction
	All vehicles entering the site will require pre-approved clearance and will need to registered to enter the site. Project security will record all instances of incoming vehicles.		EPC	Continuous	Throughout construction
	CCTV will be installed at key locations around the site and at gatehouses. Appropriate lighting will be provided at gatehouses for security personnel to ensure that unauthorised access cannot be gained.		EPC	n/a	Throughout construction
	Project personnel will only be provided access to the construction site with valid ID cards and permits to work in line with HSE requirements of the site. People trying to gain unauthorised access to the site without appropriate permits and PPE will not be permitted, or will be ejected.		EPC	Continuous	Throughout construction

Table 5-20 Community Safety and Security – Selected Mitigation & Management for Operation

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Emergency Situations	Risks to public safety will be appropriately addressed and prepared for in the operational phase 'Emergency Preparedness and Response Plan' and training. The plan will include the appropriate procedure to respond to any such incidents, as well as site specific contact details and details of external agencies who may be required.	Ministry of Environment Environmental Protection Law No. 52 of 2006 Ministry of Health Public Health Law No. 47 for 2008	O&M	n/a	Prior to operations
	The plant will have a purpose built primed fire fighting infrastructure to respond to instances of fire.		EPC to install, O&M to maintain	As required	Throughout operation
	The plant will have various mitigation controls to protect against spillage of hazardous liquids and materials, including fuels (as detailed elsewhere in this Updated ESIA).		EPC to install, O&M to maintain	As required	Throughout operation
Security	The project will employ its own security staff who will provide 24*7 security control across the plant and dedicated security staff at the gatehouse.		O&M	Continuous	Throughout operation
	Security personnel will follow a strict code of conduct and will be trained in weapons handling, human rights and receipt of grievances. Security arrangements be guided by UN Code of conducts for law enforcement officials and UN basic principles on the use of Force and Firearms by law enforcement officials.		O&M	As required	Throughout operation
	The project will be fenced with a high grade security fence with razor wire, security cameras, lookout points, and internal lighting. The fencing will include fencing to segregate the project areas from the existing HTPS HFO plant.		EPC to install, O&M to maintain	As required	Throughout operation
	All vehicles entering the site will require pre-approved clearance and will need to registered to enter the site. Project security will record all instances of incoming vehicles.		O&M	Continuous	Throughout operation
	CCTV will be installed at key locations around the project, boundaries and gatehouses. Appropriate lighting will be provided at gatehouses for security personnel to ensure that unauthorised access cannot be gained.		EPC to install, O&M to maintain	As required	Throughout operation
	Project personnel will only be provided access to the plant with valid ID cards and permits to work in line with HSE requirements of the site. People trying to gain unauthorised access to the site without appropriate permits and PPE will not be permitted, or will be ejected.		O&M	Continuous	Throughout operation

5.12 Worker Conditions and Occupational Health & Safety

Table 5-21 Worker Conditions & OH&S – Selected Mitigation & Management for Construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Human Resources Policies and Procedures	HR policies and procedures will be adapted appropriate to the size of the workforce required for the project. Policies and procedures must be prepared to demonstrate consistency with the requirements of national legislation, IFC/EBRD PS2/PR2, and international ILO and UN conventions. The Project will operate on a top down structure from ACWA Power in order to use the wider ACWA Power policies as the basis for all project-related HR policies for ACWA Power Zarqa and SEPCO III.	Ministry of Labour Labour Law No. 8 for the Year 1996 and its amendments Regulation of Protection and Safety from Industrial Tools and Machines and Work Sites No. 43 for 1998 and its amendment thereof	EPC	As required	Prior to and throughout construction
Child Labour	The EPC contractor will comply with all relevant national laws and provisions related to the employment of minors. In any event, the client will not employ children.		EPC	As required	Prior to and throughout construction
Forced Labour	The EPC contractor will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.		EPC	As required	Prior to and throughout construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Non-discrimination and equal opportunity	The EPC contractor will comply with EU requirements on non-discrimination related to employment. In particular, the The EPC contractor will: • Not make employment decisions on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements; • base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to all aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. *Please note that special measures of protection or assistance to remedy past discrimination or promote local employment opportunities or selection for a particular job based on the inherent requirements of the job, which are in accordance with national law, will not be deemed discrimination.*	Formation of Committees and Supervisors of Occupational Health and Safety Regulation No. 7 for 1998 Instructions for the Protection of Workers against the Risks of the Work Environment Regulation for Preventive and Curative Health Care for Workers in Establishments No. 42 for 1998 and its amendments thereof Regulation for the Fees of Work Permits for Non-Jordanians No. 36 for 1997 and its amendments thereof <u>Ministry of Health</u> Public Health Law No. 47 for 2008 Instructions for Prevention of Health Nuisances	EPC	As required	Prior to and throughout construction
Working Relationships	The EPC contractor will document and communicate to all workers their working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits (such as leave for illness, maternity/paternity, or holiday).		EPC	As required	Prior to and throughout construction
Working Conditions and terms of employment	The EPC contractor will provide a plan detailing how working conditions and terms of employment are compliant with national labour, social security and occupational health and safety laws. Employment relationship shall be on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. Special measures of protection or assistance to remedy past discrimination or promote local employment opportunities or selection for a particular job based on the inherent requirements of the job, which are in accordance with national law, will not be		EPC	As required	Prior to and throughout construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
	deemed discrimination.	from Workers Accommodation No.(1) for the year 2013			
Workers organisations	The EPC contractor will enable means for workers to express their grievances and protect their rights regarding working conditions and terms of employment. The EPC contractor will not discourage workers from forming or joining workers' organisations of their choosing or from bargaining collectively, and will not discriminate or retaliate against workers who participate, or seek to participate, in such organisations or bargain collectively.		EPC	As required	Prior to and throughout construction
Wages, benefits and conditions of work	Wages, benefits and conditions of work offered should, overall, be comparable to those offered by equivalent employers in the relevant region of that country/region and sector concerned.		EPC	As required	Prior to and throughout construction
Occupational Health and Safety (OHS)	The EPC contractor will provide the workers with a safe and healthy work environment, taking into account inherent risks and specific classes of hazards associated with the project. The EPC contractor shall implement and maintain an OHS management system taking into account specific risks associated with the project, legal requirements and duty of care. The EPC contractor shall be responsible for ensuring that all affiliated sub-contractors comply with the OHS management system. The OHS management system shall be in-line with recognised international best practice and as a minimum, this plan shall include: • Means of identifying and minimising, so far as reasonably practicable, the causes of potential hazards to workers. • Provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances. • Provision of appropriate equipment to minimise risks, and requiring and enforcing its use. • Training of workers, and provision of appropriate incentives for them to use and comply with health and safety		EPC	As required	Prior to and throughout construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
	procedures and protective equipment. • Documentation and reporting of occupational accidents, diseases and incidents. • Emergency prevention, preparedness and response arrangements.				
Worker Accommodation	Where accommodation is provided for workers, the accommodation shall be appropriate for its location and be clean, safe and, at a minimum, meet EBRD/IFC guideline for workers accommodation. In particular, the provision of accommodation shall meet national legislation and international good practice in relation, but not restricted, to the following: • the practice for charging for accommodation. • the provision of minimum amounts of space for each worker. • provision of sanitary, laundry and cooking facilities and potable water. • the location of accommodation in relation to the workplace. • any health, fire safety or other hazards or disturbances and local facilities. • the provision of first aid and medical facilities. • heating and ventilation. Workers freedom of movement to and from the employer-provided accommodation shall not be unduly restricted.		EPC	As required	Prior to and throughout construction
Retrenchment	If the EPC contractor anticipates collective dismissals associated with the proposed project, the EPC contractor shall develop a plan to mitigate the adverse impacts of retrenchment, in line with national law and good industry practice and based on the principles of non-discrimination and consultation. Without prejudice to more stringent provisions in national law, such consultation will involve reasonable notice of employment changes to the workers' representatives and, where appropriate, relevant public authorities so that the retrenchment plan may be examined jointly in order to mitigate adverse effects of job losses on the workers concerned. The outcome of the consultations will be reflected in the final retrenchment plan.		EPC	As required	Prior to and throughout construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Grievance Mechanism	The EPC contractor will provide a grievance mechanism for workers to raise reasonable workplace concerns. The client will inform the workers of the grievance mechanism at the time of hiring, and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides feedback to those concerned, without any retribution. The mechanism should not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.		EPC	As required	Prior to and throughout construction
Supply chain	The EPC contractor shall devise a supply management system to ensure the mitigation measures identified above can be demonstrated by associated sub-contractors. Potential adverse impacts associated with supply chains will be considered where low labour cost is a material factor in the competitiveness of the item supplied. In such circumstances, the EPC contractor will take reasonable steps to inquire about the use of child labour and forced labour in its supply chain in relation to goods and materials which are central to the core functions of the project. The EPC contractor shall identify how the above criteria be met as part of the projects procurement strategy. These criteria shall also be stipulated as prequalification requirements for all subcontractors. Evidence of subcontractor compliance shall be maintained by the EPC, via periodic supply chain audits to ensure that the evidence supplied is still valid.		EPC	As required	Prior to and throughout construction

Table 5-22 Worker Conditions & OH&S – Selected Mitigation & Management for Construction

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Human Resources Policies and Procedures	Human resource policies and procedures will be adapted appropriate to the size of the workforce required for the project. Policies and procedures must be prepared to demonstrate consistency with the requirements of national legislation and EBRD Performance Requirement 2 and IFC Performance Standard 2, particularly in regard to the full implementation of all ILO standards.	Ministry of Labour Labour Law No. 8 for the Year 1996 and its amendments Regulation of Protection and Safety from Industrial Tools and Machines and Work Sites No. 43 for 1998 and its amendment thereof Formation of Committees and Supervisors of Occupational Health and Safety Regulation No. 7 for 1998 Instructions for the Protection of Workers against the Risks of the Work Environment	O&M	As required	Prior to and throughout operation
Child Labour	The EPC contractor will comply with all relevant national laws and provisions related to the employment of minors. In any event, the client will not employ children.		O&M	As required	Prior to and throughout operation
Forced Labour	The EPC contractor will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.		O&M	As required	Prior to and throughout operation
Non-discrimination and equal opportunity	The EPC contractor will comply with EU requirements on non-discrimination related to employment. In particular, the The EPC contractor will: • Not make employment decisions on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements; • base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to all aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. *Please note that special measures of protection or assistance to remedy past discrimination or promote local employment opportunities or selection for a particular job based on the inherent requirements of the job, which are in accordance with national law, will not be deemed discrimination.*		O&M	As required	Prior to and throughout operation

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Working Relationships	The EPC contractor will document and communicate to all workers their working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits (such as leave for illness, maternity/paternity, or holiday).	Regulation for Preventive and Curative Health Care for Workers in Establishments No. 42 for 1998 and its amendments thereof Regulation for the Fees of Work Permits for Non-Jordanians No. 36 for 1997 and its amendments thereof <u>Ministry of Health</u> Public Health Law No. 47 for 2008 Instructions for Prevention of Health Nuisances from Workers Accommodation No.(1) for the year 2013	O&M	As required	Prior to and throughout operation
Working Conditions and terms of employment	The EPC contractor will provide a plan detailing how working conditions and terms of employment are compliant with national labour, social security and occupational health and safety laws. Employment relationship shall be on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. Special measures of protection or assistance to remedy past discrimination or promote local employment opportunities or selection for a particular job based on the inherent requirements of the job, which are in accordance with national law, will not be deemed discrimination.		O&M	As required	Prior to and throughout operation
Workers organisations	The EPC contractor will enable means for workers to express their grievances and protect their rights regarding working conditions and terms of employment. The EPC contractor will not discourage workers from forming or joining workers' organisations of their choosing or from bargaining collectively, and will not discriminate or retaliate against workers who participate, or seek to participate, in such organisations or bargain collectively.		O&M	As required	Prior to and throughout operation
Wages, benefits and conditions of work	Wages, benefits and conditions of work offered should, overall, be comparable to those offered by equivalent employers in the relevant region of that country/region and sector concerned.		O&M	As required	Prior to and throughout operation

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
Occupational Health and Safety (OHS)	The EPC contractor will provide the workers with a safe and healthy work environment, taking into account inherent risks and specific classes of hazards associated with the project. The EPC contractor shall implement and maintain an OHS management system taking into account specific risks associated with the project, legal requirements and duty of care. The EPC contractor shall be responsible for ensuring that all affiliated sub-contractors comply with the OHS management system. The OHS management system shall be in-line with recognised international best practice and as a minimum, this plan shall include: • Means of identifying and minimising, so far as reasonably practicable, the causes of potential hazards to workers. • Provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances. • Provision of appropriate equipment to minimise risks, and requiring and enforcing its use. • Training of workers, and provision of appropriate incentives for them to use and comply with health and safety procedures and protective equipment. • Documentation and reporting of occupational accidents, diseases and incidents. • Emergency prevention, preparedness and response arrangements.		O&M	As required	Prior to and throughout operation
Worker Accommodation	Where accommodation is provided for workers, the accommodation shall be appropriate for its location and be clean, safe and, at a minimum, meet EBRD/IFC guideline for workers accommodation. In particular, the provision of accommodation shall meet national legislation and international good practice in relation, but not restricted, to the following: • the practice for charging for accommodation. • the provision of minimum amounts of space for each worker. • provision of sanitary, laundry and cooking facilities and potable water. • the location of accommodation in relation to the workplace.		O&M	As required	Prior to and throughout operation

Impact	Mitigation	Applicable Legislation	Parties Responsible	Monitoring	Schedule
	• any health, fire safety or other hazards or disturbances and local facilities. • the provision of first aid and medical facilities. • heating and ventilation. Workers freedom of movement to and from the employer-provided accommodation shall not be unduly restricted.				
Retrenchment	If the EPC contractor anticipates collective dismissals associated with the proposed project, the EPC contractor shall develop a plan to mitigate the adverse impacts of retrenchment, in line with national law and good industry practice and based on the principles of non-discrimination and consultation. Without prejudice to more stringent provisions in national law, such consultation will involve reasonable notice of employment changes to the workers' representatives and, where appropriate, relevant public authorities so that the retrenchment plan may be examined jointly in order to mitigate adverse effects of job losses on the workers concerned. The outcome of the consultations will be reflected in the final retrenchment plan.		O&M	As required	Prior to and throughout operation
Grievance Mechanism	The EPC contractor will provide a grievance mechanism for workers to raise reasonable workplace concerns. The client will inform the workers of the grievance mechanism at the time of hiring, and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides feedback to those concerned, without any retribution. The mechanism should not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.		O&M	As required	Prior to and throughout operation
Supply chain	The EPC contractor shall devise a supply management system to ensure the mitigation measures identified above can be demonstrated by associated sub-contractors. Potential adverse impacts associated with supply chains will be considered where low labour cost is a material factor in the competitiveness of the item supplied. In such circumstances, the EPC contractor will take reasonable steps to inquire about the use of child labour and forced labour in its supply chain in relation to goods and materials which are central to the core functions of the project.		O&M	As required	Prior to and throughout operation

6 ENVIRONMENTAL MONITORING PLAN

6.1 Introduction

The objective of an environmental monitoring plan is to establish the baseline indicators to assess the overall performance and effectiveness of the environmental management programs. A monitoring program has the underlying objective of ensuring that the intended environmental mitigations are realised and that minimal deterioration occurs to the environmental parameters. The environmental monitoring program will aid management in redefining the environmental program objectives and where necessary, re-allocate the budget for implementing pollution control systems, employees' awareness and training programs, implementing pollution prevention opportunities etc. The broad objectives of the Environmental Monitoring Plan are:

- To evaluate the performance of mitigation & management measures proposed in the ESMP;
- To evaluate the adequacy of Environmental Assessment;
- To suggest ongoing improvements in the management plan based on the monitoring and to devise fresh monitoring on the basis of the improved ESMP;
- To enhance environmental quality through proper implementation of suggested mitigation & management measures; and
- To meet the requirements of the existing environmental regulatory guidelines and community obligations.

The detailed monitoring plan strategy will be determined in consultation with the Ministry of Environment and the lending banks, and will enable the ACWA Power Zarqa CCGT Project to comply with regulatory requirements for monitoring during the operational phase and in order to monitor environmental aspects during the construction stage.

Monitoring data will be analysed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken.

Additional guidance on applicable sampling and analytical methods for emissions and effluents that will be considered is provided in the IFC's General EHS Guidelines (2007).

Based on the mitigation recommendations in the Updated ESIA, the following environmental parameters will be monitored. It should be noted that this table is a summary only, and the details of the methods, parameters and frequencies are provided in the subsequent discussion.

A general monitoring plan for the proposed project is also suggested in the following sections. It is suggested to incorporate these in individual monitoring plans developed during construction and operation phase.

All monitoring results will be recorded in the site Environmental Monitoring Program register.

6.1.1 Monitoring Program for Construction Phase

The construction phase compliance monitoring will be carried out on a regular basis, using various techniques and at different intervals, by various parties. This will ensure that all activities are carried out in compliance with existing local and international standards and according to the proposed CESMP. Recommended construction phase monitoring activities are described below. These monitoring activities are to be finalised by the EPC as part of the Construction – Environmental & Social Monitoring Plan.

6.1.2 Monitoring Program for Operation Phase

The monitoring program during the operation phase provides a means of validation of the implementation and effectiveness of the mitigation & management measures incorporated in the ACWA Power Zarqa CCGT Project and developed during the Updated ESIA process, while allowing residual impacts to be predicted. This information can be used to refine the existing mitigation and, if necessary, aid in the development of additional mitigation and management measures. These monitoring activities are to be finalised by the O&M Company as part of the Operational – Environmental & Social Monitoring Plan.

6.1.3 Methods

Compliance monitoring will be conducted through regular environmental inspections, audits, control feed-back mechanisms, document control, and reviews to check if activities and operations are in compliance with proposed Jordanian standards and lender requirements.

Environmental compliance monitoring will be carried out on several different levels, namely:

- Site personnel will make general observations from their day to day activities in regard to general monitoring and monitoring detailed in the mitigation plan for 'as required/daily/general';
- The on-site team will have specific inspection programmes upon which monitoring for a checklist of parameters can be assessed visually or by equipment in place on a rapid basis, against a set checklist;
- Site personnel guided by the Environment & Social Manager will conduct continuous and/or field and laboratory monitoring of physical measurements (e.g. air, water, noise);
- The project is required to report to the lenders through periodic independent updates (construction and operation). An independent environmental consultant will be engaged to undertake such audits, in line with the CESMP /OESMP to monitor project compliance against Jordanian standards and lender requirements.

If any non-compliance is found during any of control mechanisms, the adequate correction measures will be taken. Each non-compliance will be followed-up by an investigation which will be carried out to identify sources and/or reasons for non-compliance. Based on follow up investigation results, adequate prevention measures will be implemented to ensure that non compliance will not reoccur.

6.2 Monitoring Plan Template

The following table is a very basic template design to help develop a more detailed procedure and reporting format. The government authorities will also provide the outline of the format and content of a monitoring plan that will be used for regulatory reporting purposes. In order to simplify the process, it is best to therefore adopt the regulatory authorities monitoring report template, in order to avoid duplication of works. Furthermore, the regulatory authority will provide further input to the content and methodology as is fitting to the project needs and phases of construction and operation.

Table 6-1 Basic Monitoring Template

What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
Construction				
Air quality - Particulates	Site boundary	Daily visual observations. Where excessive dust is noted (or wher grievances are registered for dust, this may require specialist monitoring equipment to provide quantitative analysis.	Daily when dust generating activities are undertaken or wind >20 knots	EPC
Air Quality - Exhausts	Vehicle / equipment exhausts	Visual inspection of the smoke (follow testing equipment specifications for use)	Daily	EPC/ Subcontractors
Noise	Site boundary and sensitive receptors	Standard noise monitoring methodology, as described in the baseline monitoring survey.	Weekly	EPC
Wastewater	All wastewater removed from site	A log of wastewater volumes and wastewater manifest shall be recorded. *Note: No construction wastewater will be directly discharged and as such no quality monitoring will be undertaken.*	Daily	EPC
Waste management	All waste removed from site	A waste log of volumes and types of waste streams will be recorded, with waste manifests.	Daily	EPC / subcontractors
	Storage of waste on-site	To check appropriate and safe storage of waste on site.	Daily	EPC / subcontractors
Soil test for heavy metals and hydrocarbons.	At identified heavy metal contaminated area after initial remediation	Collect and test a minimum of 3 soil samples collected from the top 20cm of the soil surface. To be monitored for a suite of heavy metals as per Updated ESIA baseline monitoring	Following removal of topsoil in this area at the start of construction	EPC
Ecological status	Proposed landscaping areas and construction laydowns	Outline areas for landscaping. Monitor survival and growth of plants. Survey diversity of naturally recolonized species. Ensure vacated laydown areas are appropriately returned to	Towards the completion of construction	EPC

What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
		their previous condition.		
Recruitment policy	n/a	Ratio local to immigrant labour, ensure appropriate implementation of ACWA Power overarching policy, as defined in the HR and recruitment policy	Every time there is recruitment	EPC & Project Company
Supply Chain	n/a	To ensure key supply chains are compliant with ILO conventions (including those relating to forced labour, child labour etc. as per the IFC PS).	Periodically (no defined time period)	EPC
Grievances	Point of contact to be posted at the site entrance and in areas on site for construction personnel as well as on the Project Company's website	As per SEP - Register grievances and how they have been followed up and actioned.	Every time there is a grievance	EPC
Emergency / Incident monitoring	Not applicable	Register emergencies & incidents and follow-up-remediation	In the event of an incident or emergency	EPC
Operation				
Stack Emissions. SO2, NOx, PM10, CO2, CO, O2,	A CEMS will be provided for each stack to monitor the flue gases	Gas samples will be drawn from the chimney and analysed, on a dry (undiluted) basis the concentration of NOx, CO2, CO, SO2 and O2. Particulates and opacity will be measured using in situ probe analyser installed directly in the stack. Other parameters that will also be measured on a continuous basis include: water vapour in flue gas for moisture analysis, dew point of flue gas, flue gas pressure and temperature. The samples will be drawn from the stack sample probe to the CEMS shelter with a sample pump.	Continuous monitoring and Bi-yearly Reporting Commissioning and throughout operation. Reporting of the stack emissions will be provided on a bi-yearly basis to the regulator. The report should include as a minimum the average monthly emissions values for each parameter, as well as the maximum and minimum emissions. Additionally, data regarding plant loading,	O&M

What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
			fuel consumption and other performance indicators of the boiler and abatement technologies should be included in the report, in order to ensure the optimal operation of the facility and verify continued and long-term high performance of the plant. On an annual basis, a summary emissions report should be prepared for the regulator and provided to the lenders if requested. The yearly report should include the mid year reports in an appendix and a year on year performance evaluation of the facility.	
Air Quality – Fugitive Emissions (VOC)	Connection points and linkages	General observations (e.g. olfactory) Following up to date EPA method.	Monthly	O&M
Noise	Boundary of project and nearest sensitive receptors.	For 5-minute periods at each receptor during daytime and night time periods.	Monthly	O&M
Vibration	Sensitive receptors	If required by grievances, vibration meter recording for 72hrs with reference to best international guidelines for vibration	If required	O&M
Groundwater Quality	Groundwater from project boreholes	Water samples will be taken from the boreholes following pumping and will be issued to the site laboratory for analysis of pH, TDS, TSS, Oils & Greases, TPH and PAH.	Weekly	O&M
		Water samples will be taken from the boreholes following pumping and will be issued to an independent laboratory for analysis of pH, TDS, TSS, Oils & Greases, TPH, PAH and a suite of Heavy metals.	Quarterly	O&M
Wastewater – Parameters	Discharge from	In-situ standard methodology (follow	Continuous	O&M

What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
to be analysed In situ – Temperature, pH, Conductivity, TDS, DO –	wastewater treatment	testing equipment specifications for use) in order to assess compliance against the Jordanian standards for re-using water for irrigation		
Wastewater – Parameters to be analysed Ex situ (i.e. accredited laboratory) – BOD_5, COD, TSS, Nutrients, Oil and Grease	Discharge from wastewater treatment	Ex-situ analysis of samples following a certified laboratory methodology in order to assess compliance against the Jordanian standards for re-using water for irrigation	Monthly	O&M
Wastewater – Parameters to be analysed Ex situ (i.e. accredited laboratory) – Heavy Metals (Cadmium, chromium, copper, lead and nickel)	Discharge from wastewater treatment	Ex-situ analysis of samples following a certified laboratory methodology in order to assess compliance against the Jordanian standards for re-using water for irrigation	Monthly	O&M
Storm water	After treatment in the oil and grease separators and prior disposal to the wadi	In-situ standard methodology (follow testing equipment specifications for use) and Ex-situ analysis of samples following a certified laboratory methodology – For BOD_5, COD, TSS, Nutrients, Oil and Grease, heavy metals In order to assess compliance against the Jordanian standards for discharging water into water bodies (wadi)	Periodically during rainfall	O&M
Waste management	-	Waste log	Every time that waste is taken off site or recycle onsite	O&M / subcontractors
Ecological status	New vegetation planting areas	Monitor survival and growth of plants. Survey diversity of naturally recolonized species.	Monthly	O&M
Recruitment policy	Not applicable	Ratio local to immigrant labour	Every time there is recruitment	O&M
Supply Chain	n/a	To ensure key supply chains are compliant with ILO conventions (including those relating to forced labour, child labour etc. as per the IFC	Periodically (no defined time period)	O&M

What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Who (Is responsible for monitoring?)
		PS).		
Grievances	Point of contact to be posted at the site entrance and in areas on site for construction personnel	As per SEP - Register grievances and how they have been followed up and actioned.	Every time there is a grievance	O&M
Emergency / Incident monitoring	Not applicable	Register emergencies & incidents and follow-up-remediation	In the event of an incident or emergency	O&M
Supervision (during the construction and operation phases)				
Independent Environmental Audits – Documentation	For entire project	The auditors will review the environmental documentation kept at the plant, check the adequate implementation of the environmental procedures established in the ESMP (CEMP/OEMP) and the application of the mitigation and monitoring measures stated in the Updated ESIA, including the monitoring results	Quarterly (Construction) Annually (Operation)	EPC (construction) O&M (operation)
Independent Environmental Audits — Site inspection	For entire project	The auditors will visit the plant, to ensure that the environmental procedures are being adequately applied.	Quarterly (Construction) Annually (Operation)	EPC (construction) O&M (operation)