



ENVIRONMENTAL MANAGEMENT PLAN (EMP)

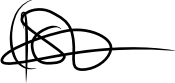



Environmental and Social Management Plan (ESMP) for the Proposed Construction and Operation of a Solar PV Plant on Camp 12 (Portion of the !Oe #Gan Traditional Authority and Gaingu Conservancy), Erongo Region

To support the proposed production of Green Hydrogen on Portion 7 of Farm 58, Walvis Bay, Erongo Region

Chiffon Trading (Pty) Ltd

26 July 2024

DOCUMENT INFORMATION		
Title	<p>Environmental Management Plan (EMP), for the Proposed Construction and Operation of a Solar PV Plant on Camp 12 (Portion of the !Oe #Gan Traditional Authority and Gaingu Conservancy), Erongo Region</p> <p>To support the proposed production of Green Hydrogen on Portion 7 of Farm 58, Walvis Bay, Erongo Region</p>	
ECC Application Reference number	APP: 004489	
Listed Activity	Activity 1: Energy Generation, Transmission and Storage Activities	
Location	Camp 12 (portion of the !Oe #Gan Communal Land), adjacent to Husab and Rossing Uranium Mines, in the vicinity fo the town of Arandis, Erongo Region	
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ACRONYMS

BID	Background Information Document
DEA	Department of Environmental Affairs
DSR	Draft Scoping Report
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
PPE	Personal Protective Equipment
RA	Roads Authority
SM	Site Manager
TEC	Tortoise Environmental Consultants

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1. INTRODUCTION

1.1. Leasehold Application

The Solar PV Plant will be constructed at Camp 12, a communal land parcel under the custodianship of the !Oe #Gan Traditional Authority which has been gazetted as a Conservancy (Gaingu), located approximately 70km east of Walvis Bay, adjacent to the Husab and Rössing Uranium mines, in the vicinity of Arandis.

The Environmental Management Plan (EMP) has been developed to obtain an Environmental Clearance Certificate (ECC) to support the leasehold application for the construction of a Solar PV Plant, at Camp 12.

The proposed Solar PV Plant is part of the larger Green Hydrogen project in Walvis Bay.

1.2. Project Components and Scope

The project has 3 sites:

ID	Description	Project Components	Current EMP Scope
Site 1	Camp 12 Arandis	Solar PV Plant	Focus
Site 2	Farm 58, Walvis Bay	Desalination, Electrolyser Plant, H2 production, NH3 Synthesis Battery Storage System	Excluded
Site 3	North Port, Walvis Bay	NH3 Storage and shipment	Excluded
Linear Infrastructure		Sub-stations & Transmission Lines Ammonia Pipeline	Excluded

1. Camp 12 is adjacent to the Husab and Rössing Uranium Mines, close to Arandis.
2. Farm 58 is located close to the Walvis Bay Airport, Walvis Bay Townlands.
3. Site is located at North port, Namport facility, Walvis Bay.

NB:

1. As highlighted in the table, the scope of this EIA is limited to the **construction footprint** and suitability of Camp 12 for the proposed **8.4 GW Solar PV Plant**.
2. All other components are **NOT** part of the scope of this EMP and will be covered in a separate EMP.

1.3. Project Proposal

The Proponent, Chiffon Trading (Pty) Ltd is a Namibian Company with strategic international partners exploring opportunities in Green Hydrogen production / manufacturing in Namibia. The proposed project would amount to significant capital investment, create employment and drive the country towards the 4th industrial revolution.

1.4. Green Hydrogen Production

Green Hydrogen is produced through an Electrolysis process. The production process has two (2) main components; (i) Energy generation by Solar Photovoltaic System (figure 1.1), and (ii) Distilled Water from Seawater Desalination Plant (figure 1.2).



Figure 1.1. Illustration of the proposed Solar PV Plant at Camp 12, near Arandis

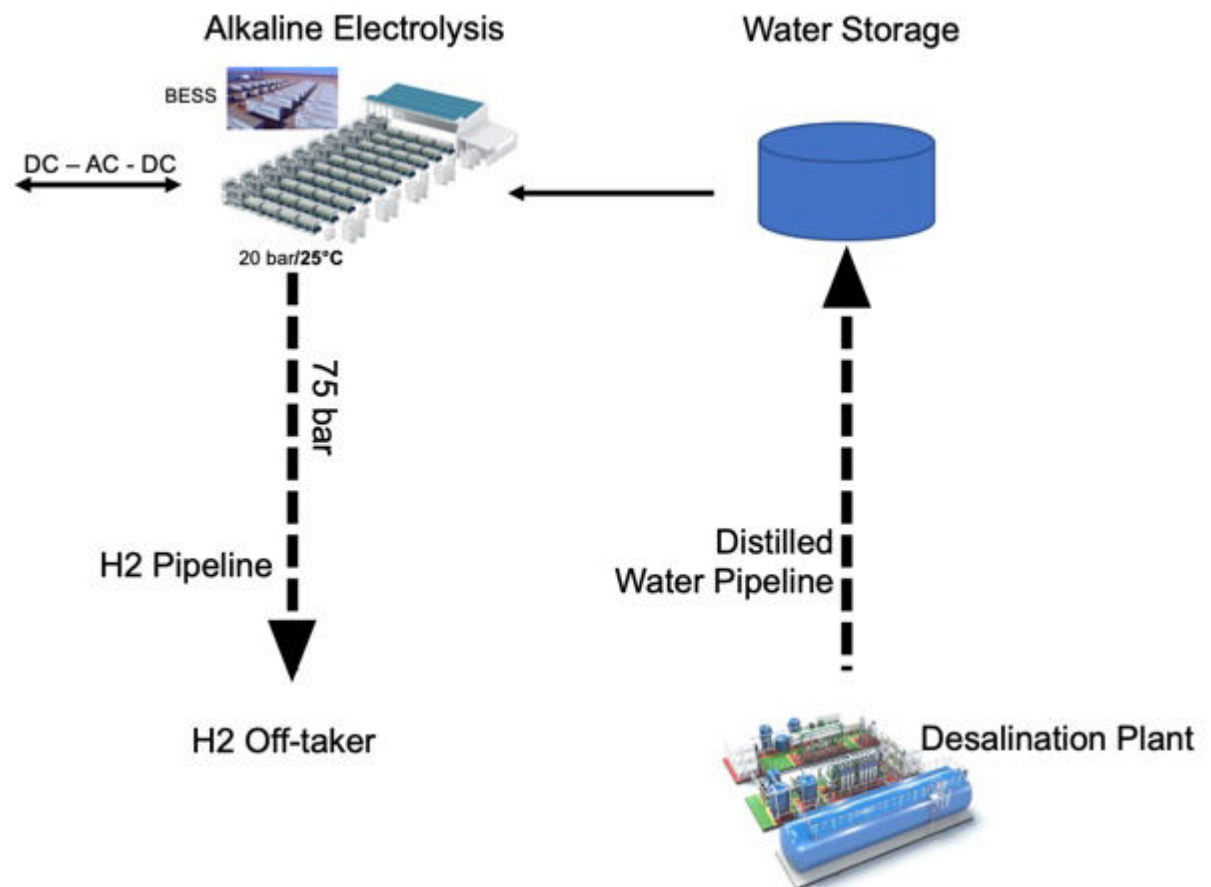


Figure 1.2. Illustration of the Green Hydrogen Project at Farm 58, Walvis Bay

1.5. Project Components

The **EMP** only covers the **construction footprint** of the **Solar PV Plant** for Camp 12:

1. Solar PV Plant
 - Construction footprint
 - Suitability of Camp 12 to host the proposed Solar PV Plant

All other project components listed below, will be covered in a **separate EMP**:

2. Operation of the Solar PV Plant and associated infrastructure
 - Sub-stations
 - Power Transmission Lines
 - Batter Energy Storage System (BESS)
3. Desalination Plant
 - Seawater intake
 - Brine effluent and pipelines
 - Distilled water pipelines and storage
4. Electrolyser Plant
 - Hydrogen Production
 - Hydrogen pipeline to the Ammonia Synthesis plant
5. Ammonia Synthesis Plant
 - Ammonia Production and Storage
 - Ammonia Pipelines to the port for export

All processes are powered by the Solar PV Plant, and hence the terminology “Green Hydrogen”.

1.6. Environmental versus Economic Development

Namibia’s economy is highly dependent on a healthy environment and striking a balance in meeting demands for economic development and maintaining biological diversity remains a priority. Therefore, it is of utmost importance that the environment and development sectors should work together and identify synergies to ensure that natural resources are utilized in an acceptable and sustainable manner.

1.7. Rational

The aim of undertaking environmental assessments is therefore to guide the sustainable utilization of natural resources and to mitigate negative impacts that would otherwise compromise the environmental integrity and future ecosystem benefits.

2. ENVIRONMENTAL MANAGEMENT PLAN (EMP) CONTEXT

The EMP has been developed in accordance with the provisions of the Environmental Management Act (Act No.7 of 2007), EIA Regulations of 2012 and other relevant / applicable legislation (across all sectors).

2.1 What is an EMP?

The Environmental Management Plan (EMP) is a risk management strategy that provides logical framework and guidelines to be undertaken during the construction and operation of the project in order to mitigate environmental threat.

The EMP recommends mitigation measures and monitoring indicators to ensure that the recommended activities are conducted in an environmentally friendly manner.

Furthermore, the EMP outlines specific roles and responsibilities for role-players against which they can be evaluated and non-compliance is punishable.

2.2 Purpose of the EMP

The purpose of the EMP is to identify potential environmental and social impacts associated with the proposed activities, in-order to ensure compliance to the EMA.

The purpose of the EMP is to ensure that the activities undertaken during construction of and operation of the Solar PV plant and Electrolyser plant are conducted in accordance with the following framework:

- i. Environmental Management Act (No. 7 of 2007),
- ii. EIA regulations of 2012 (GN: 30), and
- iii. Best environmental practices (benchmarks)
- iv. Any other applicable legislation (*as presented in Table 3.1 to 3.3*)

The EMP provides environmental guidelines to be followed throughout the lifespan of the lodge activities and comprise of the following:

- a) Environmental Aspects,
- b) Management Objective,
- c) Mitigation Measures / Actions Required,
- d) Monitoring Indicators, and
- e) Party Responsible

2.3 Objective

The objective of the EMP is to prevent / minimize (where possible), unacceptable and adverse environmental, social or economic impacts that may arise from the proposed development. Overall, the EMP aims to minimise negative impact/s (real, potential or perceived) that may result from the proposed lodge construction activities.

2.4 EMP Scope

The EMP is not limited to the construction activities of the Solar PV Plant, but it includes the bigger picture, and serves as the guiding tool to protecting the natural, bio-physical and socio-economic environment at the specific site and the surrounding area, because some impacts may not be confined to development site.

2.5 Possible adjustments to the EMP

The EMP is considered a “living” document. In other words, the EMP should allow room for adjustments if new information becomes available at a later stage, in which new / additional mitigation measures may become necessary.

The necessity of possible adjustments to the EMP may be attributed to:

- a) Lack of information or unintended omission of potential impacts during the initial ESIA scoping exercise and development of the initial EMP.
- b) Evolution or addition of new activities
- c) Development of industry best practice.

This implies that, in-addition to the information contained herein, any other relevant information that may surface during construction or operation, or through internal monitoring or auditing by the Environmental Compliance Officers (ECOs), can be added to the EMP (evolution of activities). and such changes or inclusions will be binding to the Proponent and all contractors / sub-contractors.

2.6 Implementation Framework and Accountability to the EMP

For effective implementation of the EMP, the Institutional roles are presented below. However, the specific roles and responsibilities are defined and broken down as presented in Sections 4 and 5, respectively.

Table 2:1: Role players, Institutional Framework

Role-player	Company / Institution	Role
Proponent	Chiffon Trading cc	Compliance to the EMP
Environmental Consultant	Tortoise Environmental Consultants (TEC)	Development of the EMP
Environmental Compliance Officer/s (ECO)	Ministry of Environment & Tourism (MET) – Department of Environmental Affairs (DEA)	Monitoring Compliance to EMP: <ul style="list-style-type: none"> ➤ Un-announced spot checks, ➤ Corrective measures, warning, penalties / fines, license suspension, etc
Public	Interested and affected parties (I&APs)	Report to the ECOs, any activity of social and environmental concern (e.g Pollution, safety risks, etc)

3. PROJECT INFORMATION

3.1 Construction Phase

3.1.1 Sourcing of Construction Materials

Sourcing of materials for the construction of the Solar PV plant and Electrolyser is not a problem. Many other mega projects (such as Husab and Rossing Uranium Mines) have been developed around the study site, e.g. for road construction, there are existing sand mining borrow pits and quarries, which can supply construction materials, such as sand, concrete stones.

3.1.2 Access Roads

Camp 12 is accessible via existing gravel roads D1914, D1991 and D1989 (**Figure 2.1**). Next page.

All the access roads are gravel and are mainly used for mineral exploration and tourism activities. It is thus recommended that, before commencement of construction activities, a detailed Traffic Impact Assessment must be undertaken to (i) mitigate flow of traffic and (ii) ensure protection of sensitive areas.

3.2 Transport and Accommodation for Construction Personnel

About 1,000 construction workers will be required at Camp 12 during peak construction. A temporally base camp will be constructed to accommodate about 600 people which will mitigate traffic, amongst others. The base camp will be constructed with temporary facilities including containers, prefabricated materials. If a 65-seater bus is used, it is estimated that about 20 daily trips will be made during construction.

3.3 Construction Activities

Construction vehicle / equipment: Similar to any civil construction, the project will use heavy construction equipment (yellow plant) such as tip trucks, crane trucks, water tankers, bulldozer, front loaders, excavators etc.

Digging and Trenching: The surface area is covered by desert sand with a rocky bedrock. It might be necessary to use explosives to break the bedrock. While holes for Solarr PV trackers or other poles will be dug will drilling machines.

Concrete Batching: A huge amount of concrete will be required for the project. As such, an onsite concrete batching plant will be developed.

Other activities: such as fabrication (welding) will be undertaken at workshops in the nearby towns or onsite (to be determined later).

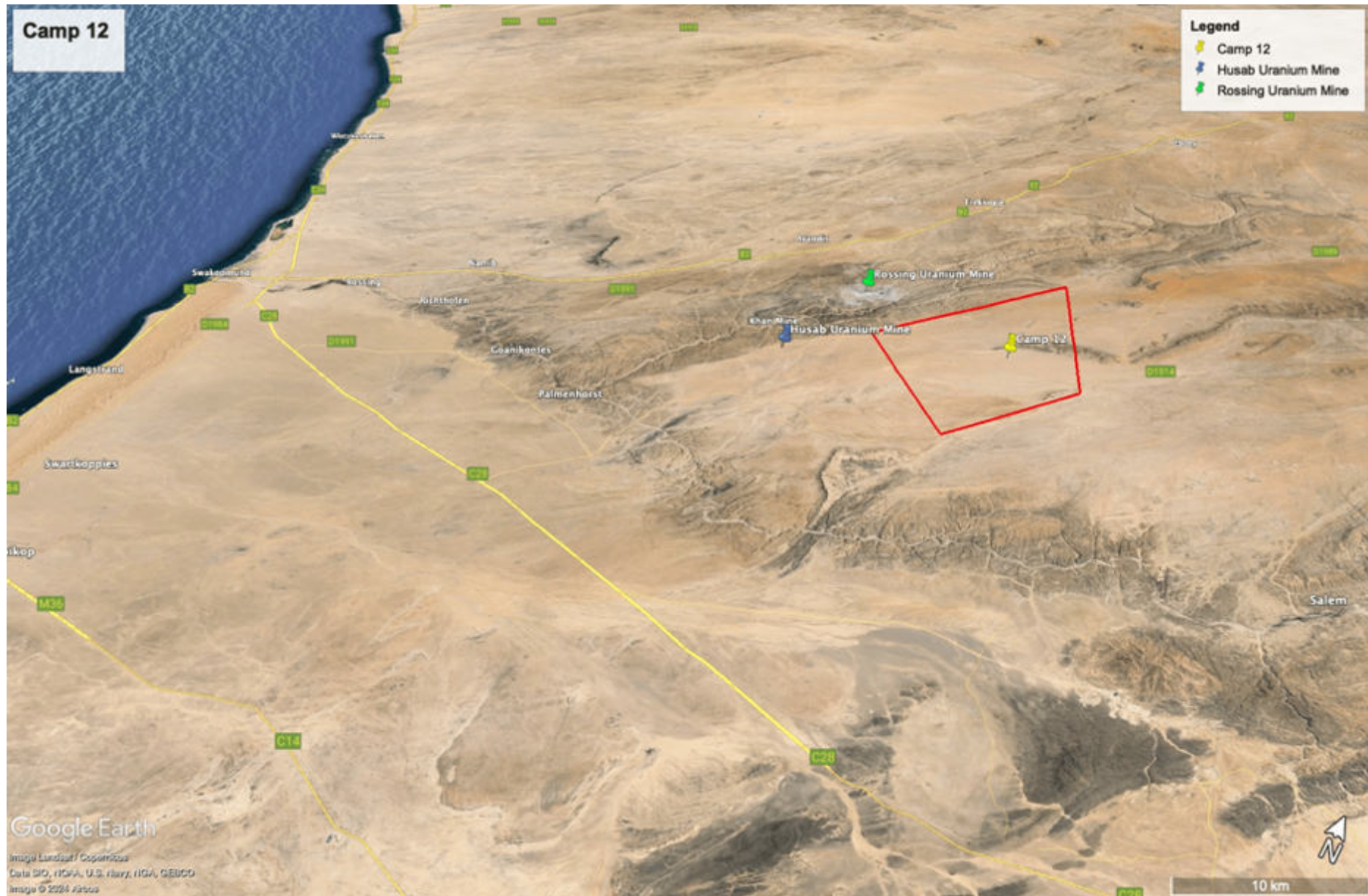


Figure 3.1: Study site – Camp 12 – close to Husab and Rossing Uranium Mines

4. COMPLIANCE AND LEGAL FRAMEWORK

4.1 Compliance to the EMP

The EMP is binding to the Proponent, and all contractors / sub-contractors. This implies that each and every entity that may have any kind of engagement or involved in / with the activities of the proposed lodge construction should comply with the EMP throughout the project lifespan. Non-compliance may have serious consequences e.g. License withdrawal.

4.2 Environmental Management Act (No.7 of 2007)

The ESMP should conform to the provisions of the Environmental Management Act (EMA), Act No. 7 of 2007 and EIA regulations of 2012 (Government Notice: 30).

The EIA Regulations defines a 'Management Plan' as:

"...a plan that describes how activities that may have significant impacts on the environment are to be mitigated controlled and monitored."

4.3 EMP Requirements

Table 4:1: EMP Requirements as outlined in Section 8 of the EIA Regulations

Requirement
<p><i>(j) a draft management plan, which includes –</i></p> <p><i>(aa) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure;</i></p> <p><i>(bb) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and</i></p> <p><i>(cc) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants.</i></p>

4.4 Listed Activities

As set out in the Environmental Management Act, 2007 (Act No. 7 of 2007, also referred to as the EMA) and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011, also referred to as the EIA regulations), Listed Activities may not be undertaken without an Environmental Clearance Certificate (ECC).

Table 4:2: Listed Activity triggered by the proposed project

Environmental Impact Assessment Regulation 2012 GRN Gazette No. 4878		
Activity	Description	Applicability to the project
Activity 1 The Construction of facilities for - (a) the generation of electricity	Construct a Photovoltaic Solar Plant and its associated Battery Storage System and Power Transmission Lines	The Photovoltaic Solar Plant will provide energy to all project components

4.5 EMP Implementation Context

Environmental management is not only concerned with the final results of the proposed project, but also with how such operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standards of the day-to-day operations required to complete the Works.

The EMP is an important tool and necessary to mitigate / counter negative environmental or social impacts that may arise from the project. However, in the absence of audits and monitoring, it will become ineffective.

4.6 Disciplinary Action

The EMP is a legally binding document and non-compliance with the EMP shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- ✓ Fines / penalties,
- ✓ Legal action,
- ✓ Withdrawal of license/s
- ✓ Suspension of work.

The disciplinary action shall be determined according to the nature and extend of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

4.7 Non-Compliance

The Proponent shall be deemed **not** to have complied with the EMP if:

- There is evidence of contravention of the EMP and associated indicators.
- The Proponent has failed to comply with corrective or other instructions issued by the Environmental Compliance Office (ECO) or qualified authority.
- The Proponent fails to respond to complaints from the public.

4.8 National Regulations

Table 4:3: Policy, Legal and Administrative Framework

Policy/Legislation	Provisions	Applicability to the Project
The Namibian Constitution	Article 95(1)2 Namibian constitution is committed to sustainable development.	Undertake Environmental Assessment to protect the environment and maintain ecological process.
Environmental Management Act (No. 7 of 2007)	The Environmental Management Act (No. 7. of 2007) aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.	The acts provide a list of activities that may not be undertake without an Environmental Clearance Certificate, consequently, carry out the EIA and develop an EMP for the project.
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. Further, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.	Management of Waste, and any pollutant resultant of the project.
Labour Act No. 11 of 2007;	Safety: A safety risk is a statistical concept representing the potential of an accident occurring, owing to unsafe operation and/or environment. In the working context “SAFETY” is regarded as “free from danger” to the health injury and to properties. Health: Occupational Health is aimed at the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers	During construction, accident are bound to happen if the working environmental is not safe and healthy. The project should maintain good and healthy standards, at the work place, cleanliness, adequate sanitary

² “The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future”.

Policy/Legislation	Provisions	Applicability to the Project
	in all occupations. This is done by ensuring that all work-related hazards are prevented and where they occur, managed.	facilities, protection against dangerous substances.
Public Health Act No. 36 of 1919	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	The Proponent should ensure that the site is off limits from public during construction to avoid fatalities.
Water Resources Management Act (2004)	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.	Optimum use of water, prevention of water pollution by project activities, regulation of waste water and effluents.
Water Act No, 54 of 1956	This act states that, all water resources belongs to the State. It prevents pollution and promotes the sustainable utilization of the resource. To protect this resources, this act requires that permits are obtained when activities involve the following; <ul style="list-style-type: none"> (a) Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall (b) Disposal of water in a manner that may cause detrimental impact on the water resources 	Optimum use of water, prevention of water pollution by project activities, regulation of waste water and effluents
Petroleum Product and Energy Act No, 13 of 1990	This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof.	During construction, there would be handling of fuel and hydrocarbons for heavy vehicles. Hence the act compels the proponent to handle hydrocarbons with safety and care not to pollute the environment.

Policy/Legislation	Provisions	Applicability to the Project
Labour Act No. 6 of 1992	This Act aims to regulate labour in general and includes the protection of the health, safety and welfare of employees. The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety.	Ensure that labour laws are followed to prevent unrest and provide a safe and healthy working environment
Regional Council Act, 1992 (Act No. 22 of 1992)	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level.	The area is in the jurisdiction of Erongo Regional Council. All relevant by-laws must be abided to.
Soil Conservation Act No. 76 of 1969	This act promotes the conservation of soil, prevention of soil erosion.	Improper planning of construction can cause soil degradation and erosion through earth work.
National Heritage Act No. 27 of 2004	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as	Uncoordinated construction activities such as digging and trenching may unearth heritage archaeological material. Ensure heritage studies are done to ensure protection of heritage materials.
Best Practice	<p><i>Precautionary Approach Principle</i> This principle is worldwide accepted when there is a lack of sufficient knowledge and information about the possible threats to the environment.</p> <p><i>Polluter Pays Principle</i> This principle ensures that proponents take responsibility of their actions. Hence in cases of pollution, the proponent bears the full responsibility to clean up the environment.</p>	<p>Although not envisioned, the proponent is urged to apply great precaution in an even of uncertainty.</p> <p>In the event of a pollution, the proponent shall incur clean-up cost.</p>

4.9 International Regulatory Framework

4.9.1 The World Bank Environmental and Social Management Framework

The World Bank (WB) Environmental and Social Framework (ESF) sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards (ESS) that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity (World Bank, 2017)³ (Table 4.4)

Table 4:4. The World Bank Environmental and Social Standards

No	ESS	Description	Applicability to the project
1.	Assessment and Management of Environmental and Social Risks and Impacts	This ESS sets out the borrowers' responsibility to identify, assess, manage and monitor environmental and social risks and impacts associated with each stage of the project. -	a) Use the WB ESF b) Conduct an environmental and social assessment proposed project, including stakeholder engagement c) Undertake stakeholder engagement and disclose appropriate information d) Develop an ESCP and implemented all measures and actions set out in the ESCP e) Conduct monitoring and reporting on environmental and social performance of project against ESS
2.	Labour and Working Conditions	This ESS recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions	Requirements prescribed for: a) Working conditions and management of worker relationships b) Protecting the work force c) Grievance mechanism d) Occupational Health and Safety e) Contracted Workers f) Community Workers g) Primary Supply workers
3.	Resource Efficiency and Pollution	This ESS recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume	Requirements prescribed for:

³ International Bank for Reconstruction and Development/World Bank (2017). Environmental and Social Framework

No	ESS	Description	Applicability to the project
	Prevention and Management	finite resources that may threaten people, eco- system services and the environment at the local, regional, and global levels. It sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle.	a) Resource efficiency (Energy use, Water use, Raw materials use) b) Pollution prevention and management
4.	Community Health and Safety	This ESS recognises that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. Communities that are already subjected to impacts of climate change may experience intensification of impacts due to project activities. It addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to vulnerable people	Requirements prescribed for: a) Community health and Safety - Infrastructure and equipment design and safety - Safety of Services - Traffic and road safety - Ecosystem services - Community exposure to health issues - Emergency preparedness and response - Management and safety of hazardous materials b) Security personnel
5.	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	This ESS applies to permanent or temporary physical and economic displacement resulting from land acquisition or restrictions on land use undertaken or imposed in connection with project implementation. Objectives: - To avoid or minimise involuntary resettlement - To avoid forced evictions - To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use	a) General requirements: - Eligibility classification - Project design - Compensation and benefits for affected persons - Community Engagement - Grievance mechanism - Planning and implementation b) Displacement - Physical displacement - Economic displacement
6.	Biodiversity Conservation and Sustainable	The requirements of this ESS are applied to all projects that potentially affect biodiversity or habitats, either positively or	a) Assessment of risks and impacts b) Conservation of biodiversity and habitats

No	ESS	Description	Applicability to the project
	Management of Living Natural Resources	negatively, directly or indirectly, or that depend upon biodiversity for their success. Objectives: <ul style="list-style-type: none"> - To protect and conserve biodiversity and habitats - To apply the mitigation hierarchy and precautionary approach in the design and implementation - To promote the sustainable management of living natural resources - To support livelihoods of local communities and adoption of practices that integrate conservation needs and development priorities 	<ul style="list-style-type: none"> c) Legally protected and internationally recognised areas of high biodiversity value d) Invasive alien species e) Sustainable management of living natural resources
7.	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	This ESS contributes to poverty reduction and sustainable development by ensuring that projects supported by the Bank enhance opportunities for Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities ⁴ to participate in, and benefit from, the development process in ways that do not threaten their unique cultural identities and well-being	<ul style="list-style-type: none"> a) Avoidance of adverse impacts b) Mitigation and development benefits c) Meaningful consultation tailored to indigenous peoples/Sub-Saharan African historically underserved traditional local communities d) Obtain Free Prior and Informed Consent (FPIC) e) Establish grievance mechanism
8.	Cultural Heritage	This ESS sets out general provisions on risks and impacts to cultural heritage from project activities. The term 'cultural heritage' encompasses tangible and intangible heritage, which may be recognized and valued at a local, regional, national or global level, as:	<ul style="list-style-type: none"> a) Stakeholder consultation and identification of cultural heritage b) Legally protected cultural heritage areas c) Provisions for specific types of cultural heritage

⁴ As the applicability of the term "Indigenous Peoples" varies widely from country to country, the Borrower may request the Bank to use an alternative terminology for the Indigenous Peoples as appropriate to the national context of the Borrower.

No	ESS	Description	Applicability to the project
		<ul style="list-style-type: none"> - Tangible cultural heritage (includes immovable objects, sites, structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance - Intangible cultural heritage (includes practices, representations, expressions, knowledge, skills and cultural spaces associated with that community. 	d) Commercial use of cultural heritage
9.	Financial Intermediaries (FIs)	<p>FIs are required to monitor and manage the environmental and social risks and impacts of their portfolio and FI subprojects, and monitor portfolio risk, as appropriate to the nature of intermediated financing.</p> <p>Objectives:</p> <ul style="list-style-type: none"> - To set out how the FI will assess and manage environmental and social risks and impacts associated with the subprojects it finances - To promote good environmental and social management practices in the subprojects the FI finances - To promote good environmental and sound human resources management within the FI 	<ul style="list-style-type: none"> a) Environmental and social procedures b) Environmental and social policy c) Organisational capacity and competency d) Monitoring and reporting e) Stakeholder engagement
10	Stakeholder Engagement and Information Disclosure	<p>This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation</p>	<ul style="list-style-type: none"> a) Stakeholder identification and analysis b) Establish a Stakeholder Engagement Plan c) Provide Information disclosure d) Undertake meaningful consultations e) Continue engagements during project implementation and external reporting f) Establish and implement a grievance mechanism g) Organisational capacity and commitment

4.9.2 Equator Principles⁵

The Equator Principles (EP) are used by financial institutions to identify, assess, and manage environmental and social risks when financing projects. The EP apply to all industry sectors globally, to five (5) financial products:

- Project Finance Advisory Services of project capital more than USD10 million
- Project Finance with project capital costs of more than USD10 million
- Project-Related Corporate Loans
- Bridge Loans
- Project-related Refinance, and Project-related Acquisition Finance

Table 4:5. The Equator Principles

Equator Principle	Description
1. Review and Categorisation	A project proposed for financing is categorised based on the magnitude of potential environmental and social risks and impacts, including those related to Human Rights, climate change, and biodiversity. The Categories are based on the International Finance Corporation (IFC)'s environmental and social categorisation process” <ul style="list-style-type: none"> - Category A- Projects with significant adverse environmental and social risks that are irreversible or unprecedented - Category B- Projects with potential limited adverse environmental and social risks that are largely reversible and can be addressed through mitigation measures - Category C- Project with minimal or no adverse environmental risks or impacts
2. Environmental and Social Assessment	Clients are required to conduct appropriate assessments to address environmental and social risks and the scale of impacts of the proposed project. The assessment should include measures to minimise, mitigate, compensate/offset for risks and impacts to those affected.
3. Applicable Environmental and Social Standards	The Environmental and Social Assessments should first address compliance with the relevant laws, regulations and permits pertaining to environmental and social issues of the host country.

⁵ Equator Principles (2020). Equator Principles EP 4- July 2020. Source: <https://equator-principles.com/about-the-equator-principles/>

4. Environmental and Social Management System and Action Plan	For all Category A and Category B projects, clients are required to develop and maintain an Environmental and Social Management System (ESMS) to address issues raised in the assessment process.
5. Stakeholder Engagement	For Category A and Category B projects, clients are required to demonstrate effective stakeholder engagement as an ongoing process, by adopting culturally appropriate manner with all affected parties.
6. Grievance Mechanism	As part of the ESMS, for all Category A and B projects, clients are required to establish effective grievance mechanisms that are designed for use by all affected parties
7. Independent Review	For all Category A and B projects, an independent Environmental and Social Consultant will carry out an independent review of the assessment including the ESMPs, ESMS and stakeholder engagement process to assess due diligence and compliance to the EP.
8. Covenants	For all Projects, where a client is not in compliance with its environmental and social covenants, the EPFI will work with the client on remedial actions to bring the Project back into compliance. If the client fails to re-establish compliance within an agreed grace period, the EPFI reserves the right to exercise remedies, including calling an event of default, as considered appropriate.
9. Independent Monitoring and Reporting	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting
10. Reporting and Transparency	The EPFI will, at least annually, report publicly on transactions that have reached Financial Close and on its Equator Principles implementation processes and experience

4.9.3 European Bank for Reconstruction and Development (EBRD)

The EBRD is an international financial institution providing project financing for banks, industries and businesses, for both new and existing companies. The EBRD funds come mainly from bilateral donors such as Climate Investment Funds, European Union, Global Environment Facility and Green Climate Fund. The bank provides direct financial instruments such as loans, equity investments and guarantees⁶.

- The EBRD was the first multi-lateral development bank to have an explicit environmental mandate in its charter and has pledged to dedicate 40% of its financing into the Green Economy Transition⁷.

⁶ EBRD Sustainability report. Source: www.ebrd.com

⁷ Mahmood, M., & Orazalin, N. (2017). Green governance and sustainability reporting in Kazakhstan's oil, gas, and mining sector: Evidence from a former USSR emerging economy. *Journal of cleaner Production*, 164, 389–397

- The EBRD has an Environmental and Social Policy with 10 requirements. All projects financed by the EBRD should be structured to meet the requirements of the policy. The 10 performance requirements of the EBRD are based on the 10 World bank Environmental and Social standards and will hence not be repeated.

4.9.4 International Finance Corporation (IFC)⁸

The IFC is a member of the World Bank Group and is the largest global development institution focused exclusively on the private sector in developing countries.

The IFC has eight (8) Performance Standards that should be met throughout the life cycle of the project financed. All the eight (8) performance standards are derived from the on the World Bank's 10 ESS with the exception of ESS9 (Financial Intermediaries) and ESS10 (Stakeholder Engagement and Information Disclosure).

The performance standards of the IFC are designed to provide guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

For direct investments, IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced.

⁸ Source: www.ifc.org

5. ROLES AND RESPONSIBILITIES

This section outlines the roles and responsibilities of the key personnel responsible for the day-to-day management of activities to ensure effective implementation of the EMP.

5.1 Roles and Responsibilities

To ensure accountability, it is necessary to assign responsibilities. The key role-players for project implementation are;

- a) The **Environmental Compliance Officer (ECO)** representing the Ministry of Environment and Tourism (MET), or an appointed independent environmental officer, who is responsible for monitoring and auditing.
- b) **The Proponent**: Owner / Investor / Developer, whatever the project development set-up is.
- c) **The Site Manager**: the person appointed by the Proponent, who is responsible for the day-to-day management of the project site.

5.1.1 The Environmental Compliance Officer (ECO):

The ECO refers to the party responsible for the environmental monitoring and auditing to ensure that the provisions of the EMP are complied with.

The ECO shall have adequate environmental knowledge to understand and interpret the EMP and pertaining environmental aspects associated with the project. The specific tasks of the ECO are as follows:

- To undertake all monitoring and auditing activities in-order to ensure compliance with the EMP.
- Conduct arranged site inspection prior to the commencement of activities; and at reasonable intervals (e.g. every month, quarterly or annually), throughout the duration of the project. Depending on the risks, some projects may be inspected more frequently (e.g. every month).
- Conduct unannounced spot checks and submit compliance reports to the respective authorities
- Conduct and submit rehabilitation report after conclusion a specific activity
- Liaise closely with all key stakeholders i.e. Proponent, Site Manager and the Environmental Commissioner.
- Provide guidance on any environmental management issues, incidents or emergencies that may arise throughout the project lifespan.
- Provide recommendations for remedial action in the event of non-compliance.
- Auditing or monitoring activities may involve investigation, structured observation, measurement, and evaluation of environmental data.

5.1.2 The Proponent:

The specific responsibilities of The Proponent are as follows:

- Appoint a Site Manager (SM) to oversee the daily onsite activities.
- Liaise closely with the SM and ECO on any environmental management issues, incidents or emergencies.
- Ensure that all activities on and around the site are conducted in accordance with the requirements of the EMP at all times.
- Ensure that all sub-contractors and visitors to the site are conversant with the requirement of the EMP, relevant to their roles on site.
- Shall develop a **communication strategy** between The Proponent, Site Manager, workers, the ECO and any other relevant stakeholder.
- Shall develop an **organisational structure** to ensure that:
 - There are clear channels of communication
 - There is an organisational hierarchy for effective implementation of the EMP; and
 - Conflicting or contradictory instructions are eliminated
 - Ensure that all instructions and official communications regarding environmental matters shall follow the organisational structure as determined
 - Ensure that that EMP requirements are assigned to specific people / positions with the capacity and experience required for implementation.

5.1.3 The Site Manager :

The **Site Manager (SM)** should:

- Ensure that each team recruited to work at the sites, adheres to the EMP.
- Ensure that a **copy of the EMP is always kept on site and as it may be requested by authorities conducting spot checks at any time.**
- Ensure that all staff attend an induction session before commencement of any work on site and that they are adequately informed of the requirements of the EMP.
- Shall take special care to prevent irreversible damage to the environment.
- Ensure that activities are within the boundaries of the proposed zones as specified Site Map and boundary markings (visible pegs, tape etc).

5.2 EMP Implementation Context

Environmental management is not only concerned with the final results of The Proponent's operations, but also with how such operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standards of the day-to-day operations required to complete the Works.

The EMP is an important tool and necessary to mitigate / counter negative environmental or social impacts that may arise from the project. However, in the absence of audits and monitoring, it will become ineffective

6. PROJECT DESIGN AND PLANNING

The EMP provides mitigation measures in accordance with the scope of work during the construction and operations of the proposed development. The recommended mitigation measures should be considered at all stages / phases of the development process as follows:

- Design
- Planning
- Site preparation, and
- Construction and Operational Phase

6.1 Design phase

The design phase entails the conceptual framework (what, where, how big, etc) and initial engineering designs, and machinery required for the proposed development.

6.2 Planning phase

During the planning phase, it is imperative that the design is re-evaluated and if any environmental concern is detected at this stage, corrective measures should be applied. In-addition, a contingency plan should be in place, in case, unforeseen environmental concerns are detected later.

6.3 Site Preparation

To provide a systematic guide for the development of mitigations measures, the proposed development site preparation can be broken down / sub-divided into different development stages / phases as presented in the table 5.1 below.

Table 6-6:1: Site Preparation Phases requiring mitigation measures

Phase	Description
Phase 1	Access roads and routes
Phase 2	Site Clearing and deployment of machinery
Phase 3	Decommissioning – Removal of all unwanted material after the Site Manager of houses, clean-up, landscaping, and rehabilitation

6.4 Construction and Operational Phase

For ease of reference and monitoring during operation, the EMP is sub-divided into different themes and for each theme, the following aspects are highlighted:

- ✓ Potential Impact,
- ✓ Environmental Management Objective
- ✓ Mitigation Measures / Management Action/s required
- ✓ Indicator/s for Monitoring and Compliance
- ✓ Party responsible for implementation

7. POTENTIAL IMPACTS AND MITIGATION MEASURES

7.1 Impact Themes and Recommended Mitigation Measures

The EMP has been categorised into different themes, which serve as a quick guide to the recommended EMP remedial actions during the construction and Operation stages (Table 7.1 to 7.7).

EMP Themes	Specific Aspects
A – Staff induction	Induction
	Site Demarcation
	Communication
B – Health and Safety	General safety at work place
	Road Safety
	Ablution facilities
	Dust and Noise
C – Pollution and Waste Management	General waste: <i>Material waste (off cuts), concrete rubble, garden & domestic waste,</i>
	Vehicle emissions (smoke)
	Oil Spills
	Any other waste
D – Environment	Access roads
	Soil and Water Pollution
	Ablution facilities
	Waste Disposal
E – Socio economic	Employment opportunities for Locals
	Alcohol and Drug use
	Working hours
	HIV / AIDS
	Safety and Security
F – Cultural Heritage	Heritage resources / artefacts
G – Rehabilitation	Clean-up and maintain natural / original appeal

SECTION A: STAFF INDUCTION

Table 7:1: Mitigation measures pertaining to staff Recruitment and Induction

Potential Sources of Impacts:				
<ul style="list-style-type: none"> ✓ Employees working without employment contracts (recipe for labour disputes) ✓ Lack of adequate induction to inform the workers about the Do's and Don'ts ✓ Lack of formal orientation of the construction workers process (confusing and disorientation of workers) ✓ Poor Communication ✓ No formal presentation of the EMP and employees are not aware of the content and risks associated with the activities / actions 				
Impact	Objective	Mitigation Measures	Indicators for Monitoring and Compliance	Responsible Party
Recruitment	To ensure that all workers have employment contracts (Labour Act No. 11 of 2007)	Formalize recruitment of all staff with Contracts, stating nature of employment, duration and remuneration to protect both parties and to avoid labour disputes later on	Copy of staff contracts	Proponent / Site Manager
Staff Induction	To ensure that all staff / employees are conversant with the requirements of the EMP	<p>Induction for all workers on the provisions of the EMP before work commencement, covering but not limited to: Safety, Health and Environmental (SHE) measures, emergency response, reporting of incidents, HIV/AIDS awareness, alcohol and substance abuse, etc</p> <p>Staff who are operating equipment (such as trucks, loaders, jack hammers, compressors etc.) shall be adequately trained and sensitised against potential hazards</p>	<p>Induction Minutes and Attendance Register, Signed by each and every staff member</p> <p>Staff members appointed at a later stage should also undergo induction</p> <p>Quarterly minutes</p>	Site Manager

		Conduct Quarterly induction reviews and reflect on workers conduct		
	Availability of the EMP on site for ease of reference	Ensure that a copy of the EMP is kept on site and accessible by team leaders	Availability of EMP on site and accessibility by team leaders	Site Manager
	Punitive measures for staff, to ensure compliance	Adopt a disciplinary system to discipline staff for non-compliance, for offences such as littering, speeding, safety risk (both to themselves and to others), not using ablution facilities, etc.	Number of fines issued daily / per month	Site Manager
Communication	Ensure effective communication throughout the and construction period (project lifespan)	Develop a communication strategy (Channel & medium of communication) All correspondence should be written and signed off by witnesses (e.g Site Manager / team leaders) The contact numbers for the Site Manager and Team Leaders must be available onsite (displayed) in case of emergencies.	Communication Strategy Letters, e-mail, Notices, Minutes List of contact numbers available on site	Site Manager
Site Demarcation	To contain all project activities within the site boundaries and prevent and construction activities from extending beyond the and construction claims	Demarcate the and construction site with visible marking (e.g. fence, pegs, tape etc.) If need be, obtain permission from relevant authorities to make use of adjacent land e.g for temporary staff accommodation or machinery warehouse.	Temporary fencing or any other visible site demarcation in place	Site Manager
Notice Board	To warn any person (employees and public) entering the and construction site	Erect a notice board at the site entrance to notify employees and the public that they entering a construction site.	Visible notice board	Site Manager

SECTION B: OCCUPATIONAL HEALTH AND SAFETY

Table 7.2: Mitigation measures pertaining to Health and Safety

Potential Sources of Impacts:				
<ul style="list-style-type: none"> ✓ Inadequate training of employees or contractors on risks associated with Solar PV Plant and Electrolyser Plant development activities ✓ Safety hazards may occur if equipment is not handled in the correct manner ✓ Employees not receiving the correct Personal Protective Equipment (PPE) for their specific responsibilities. ✓ Employees not adhering to safety rules implemented at the site ✓ Noise generated by vehicles and equipment during the proposed activities 				
Impact	Objective	Mitigation Measures	Indicators for Monitoring and Compliance	Responsibility
General Occupational Health and Safety of the employees (injuries)	To ensure safe working conditions and adhere to the Health and Safety Regulations, Government Notice 156/1997 (GG 1617)	<p>Develop a Health and Safety Plan</p> <p>Identify potential hazards and develop responses to eliminate sources of risk or minimize workers' exposure to hazards</p> <p>Provide adequate and appropriate personal protective equipment for all workers</p> <p>Provide training to all workers on relevant aspects of occupational health and safety associated with their daily work</p> <p>Provide sufficient fire extinguishers and train staff on how to use them and the applications thereof</p>	<p>Health and Safety Plan</p> <p>Hazard risk report</p> <p>Safe work condition audit</p> <p>Personal protective equipment issue (Distribution register)</p> <p>Adequate protective gear for all staff</p> <p>Training schedule and attendance register</p> <p>Availability fire extinguishers and evidence training (e.g. minutes, training pictures etc</p>	Site Manager

Accidents and incidents	To ensure safe working conditions	<p>Report occupational injuries, illness and fatalities, including near misses.</p> <p>Investigate causes and take appropriate action to eliminate risks where possible</p> <p>Provide adequate access to first aid and medical assistance in cases of work-related accidents or injuries</p>	<p>Accidents & incidents register (including near misses)</p> <p>Root causes analysis report Incident review (cause and elimination of hazard)</p> <p>First aid kit availability and adequacy audit report</p>	Site Manager
Physical Hazards to workers	To ensure safe working conditions	Eliminate physical hazards to workers and mitigate any residual risks	Hazards risk report	Site Manager
Road Safety	To prevent traffic hazards / inconveniences from earth moving machinery during and construction period	<p>Signage for vehicles and earth moving machinery</p> <p>All trucks transporting materials (e.g sand / gravel) should be covered with suitable material (e.g net, tarpaulin, canvas etc)</p> <p>Adhere to traffic rules and speed limits both on and off the and construction site</p>	Public Complaints / Incident report/s	Site Manager
Ablution Facilities	To reduce health risks and environmental pollution and ensure healthy working environment with appropriate and user-friendly ablution facilities	<p>Ensure adequate, hygienic (clean) and user-friendly ablution facilities for all staff. Mobile chemical toilets are recommended</p> <p>Wastewater should be discharged in accordance with the effluent discharge regulations. No faecal waste should be discharged on site</p>	<p>Inspect ablution facilities regularly (daily)</p> <p>Availability of toilets, cleanliness and hygienic ablution facilities</p>	Site Manager

		<p>Acts of excretion and urination, other than at the toilet facility provided, shall be strictly prohibited.</p> <p>Appoint a cleaner or rotate cleaning responsibilities among workers. If necessary, designate Male and Female toilets</p>	<p>Incidents or complaints of waste discharge into the environment</p>	
Dust and Noise	<p>To mitigate dust and noise impacts to both employees and the public.</p> <p>To minimise noise disturbances during the and construction phase.</p>	<p>Adopt applicable dust suppression measures to mitigate dust impacts.</p> <p>Provide dust masks and earmuffs to all employees operating in a dusty or noisy environment.</p> <p>Alert the community and public of noisy undertakings prior (e.g blasting).</p>	<p>Dust and Noise Incident Reports.</p> <p>Monitoring of dust and noise levels using modern equipment such as: <i>Galvometric Dust Sampler, Personal Dust Monitor, Data Ram, Sound Level Meter, etc</i></p>	<p>Site Manager</p>
Fire Risk / Hazard	<p>To mitigate fire risk</p>	<p>Use and Contain fire for cooking purposes and apply caution to prevent an un-controlled fire throughout the project lifespan.</p> <p>The same fire caution should be adopted by smokers (smother the cigarette bud before disposing in appropriate waste bin or burry underground.</p> <p>Provide / install Fire extinguishers in accordance with safety regulations</p>	<p>Staff induction to demonstrate the use of fire extinguishers and fire hydrants</p> <p>Adequate and Service records</p>	<p>Site Manager</p>

SECTION C: POLLUTION AND WASTE MANAGEMENT

Table 7:3: Mitigation measures pertaining to Waste Management

<u>Potential Sources of Impacts:</u>				
<ul style="list-style-type: none"> ✓ Disregard of the pollution impacts (often considered insignificant e.g. littering, oil spills etc) ✓ Poor management, storage and disposal of concrete and cement or spillages from equipment (e.g. cement mixers), and general spillage of contaminated wash or wastewater ✓ Oil spills (includes fuel, grease, etc) ✓ Leaking or broken sewerage pipes ✓ Storage of unwanted waste (e.g. old / waste tyres) and poor disposal systems dispose 				
Impact	Objective	Mitigation Measures	Indicators for Monitoring and Compliance	Responsible Party
Vehicle emissions	Reduce greenhouse gas (GHG) emissions from poorly maintained or malfunctioning equipment (vehicles / machinery).	All vehicles and equipment shall be kept in good working order and serviced regularly (in accordance with the servicing frequency of the specific machinery), in order to prevent emission of noxious smoke etc	Vehicle servicing records Reports of smoke emissions from machinery	Site Manager
Oil Spills	Ensure waste oil is managed appropriately, and pollution is prevented at all costs	Provide concrete bunding for fuel storage and transfer on site. The bunding should be bigger than the fuel storage tank/s to allow a bit of working space around tank/s (e.g 20% bigger than the tank/s) Use of sheeting to prevent soil contamination (e.g. during vehicle servicing)	Concrete bunding at all fuel storage and handling sites	Site Manager

		<p>The fuel tanks should stand on a concrete slab or other suitable surface to prevent the leakage of contaminants into the soil.</p> <p>Concrete slabs or other suitable surface should be installed at each point where hazardous materials are handled.</p> <p>Waste oil should not be stored onsite indefinitely and should be recycled (transfer to oil recycling companies)</p> <p>If an oil spill occurs, collect the contaminated soil, store in drums and dispose at appropriate waste disposal site (e.g. Municipal disposal site)</p> <p>All vehicles and machinery should be fitted with oil drip trays to prevent oil dripping to the ground.</p>	<p>Drums or containers for oil recycling and proof of oil transfer to recycling companies</p> <p>Oil drip trays for each vehicle</p>	
Solid Waste	To prevent pollution and maintain a clean environment	<p>Classify waste into different categories e.g. material waste (wood, steel, corrugated iron etc), building rubble (concrete), garden waste (tree stumps, branches etc), and domestic waste (Litter – cans, plastics, tissues etc)</p> <p>Each category should be disposed of in accordance with the Municipal Regulations and in the most suitable and environmentally acceptable manner.</p>	Scattered waste, Littering and any other unsightly waste at the site (eyesore)	Site Manager / dedicated Waste Disposal Officer

		<p>All waste produced on site should be contained and disposed as per Municipal regulations.</p> <p>No onsite burying, dumping or burning of waste material shall be permitted.</p> <p>Ensure appropriate waste collection and removal from the site and dispose at appropriate municipal waste disposal sites.</p>		
Waste Water	To avoid effluent discharge into the environment	<p>Refer to regulations on effluent disposal</p> <p>Be on the look-out and repair any leaking or broken sewer pipes (regardless of how small it may be perceived).</p>	No leakage of sewer pipes	Site Manager or dedicated Plumber

SECTION D: ENVIRONMENT

Table 7:4: Mitigation measures pertaining to Environmental impacts

Potential Sources of impacts:				
<ul style="list-style-type: none"> ✓ Uncontrolled vehicle routes (everyone drives wherever they want) ✓ Lack of awareness amongst workers and contractors of how their actions may impact on the environment. ✓ Soil erosion and biodiversity loss due to the clearance of vegetation, excavations etc ✓ Over-utilization and wastage of water resources 				
Impact Description	Objective	Mitigation Measures	Monitoring & Compliance Indicators	Responsible Party
Landscape alteration and Visual Impact	Limit the number of access roads	Instruct drivers to stick to demarcated roads and only create new access routes when necessary	Instructions / Meeting Minutes, signed by drivers	Site Manager
	Minimize / limit visual impact	Limit Landscape alteration Colour Schemes for infrastructure (buildings, walls, fences etc) should blend in with the natural environment	Colour Schemes presented and approved by authorities	Proponent (Architect)
Ecological disturbances (both fauna and flora)	Minimize disturbance to prevent loss of biological diversity	Remove trees / bushes / grass only as necessary (if it obstructs the and construction process)	Photographic records of site before and construction commencement. Regular review of photographic records	Site Manager
High Water Demand and wastage of water resources	Limit water abstraction and water use Recycle and re-use water as far as possible	Obtain water abstraction permits from MAWF – Water Affairs. Permits are required for both: collection of water from the river or for drilling of boreholes.	Water demand and records for water use, water saving mechanisms and recycling efforts	Site Manager

<p>Land degradation and loss of topsoil leading to soil erosion</p>	<p>To reduce soil erosion</p>	<p>Adopt soil protection measures to mitigate soil erosion against storm water (run-off).</p> <p>Compacted soil should be ripped to ensure effective re-vegetation.</p>	<p>Photographic records of site before commencement</p>	<p>Site Manager</p>
<p>Pollution of surface and groundwater resources</p>		<p>Install oil and grease traps, cleaning up spills immediately and proper disposal of contaminated material.</p> <p>Keep appropriate equipment to deal with emergency spill incidents on site. e.g spill kits for hydrocarbons, drip trays for equipment and/or machinery leaks, drums or containers, for contaminated water</p> <p>Immediately clean all spillage of fuels, lubricants and other petroleum-based products.</p> <p>No hazardous chemicals must be discharged in the sewage / water systems.</p> <p>Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site.</p>	<p>Adequate drainage system/channel in place</p> <p>Inventory registers for all chemicals</p> <p>ECO to verify implementation of the mitigation measures proposed in this EMP and compile the report</p>	<p>Site Manager ECO</p>

<p>Poor waste management, including bad odour and scattered waste onsite</p>	<p>To prevent pollution due to poor waste management</p>	<p>Installation of sufficient waste bins skips or bulk containers. Containers must always be present on site.</p> <p>Containers used for the disposal of general and hazardous waste must be demarcated accordingly.</p> <p>General waste material should always be stored or disposed separately from hazardous waste material (e.g. oil, diesel), and deposited into separate and appropriately marked bins, skips or bulk containers</p> <p>Waste material may only be temporarily stored on site and should be removed to a licensed landfill every week / month, or as necessary</p> <p>No littering is permitted, and site clean-ups must be regularly undertaken</p>	<p>Regular site inspections Internal audits against this EMP must be conducted every 6 months and records kept onsite Shortcomings must be addressed immediately</p>	<p>Site Manager</p>
<p>Soil and groundwater pollution from unsanitary conditions onsite</p>	<p>To prevent soil, and groundwater pollution from unsanitary conditions onsite.</p>	<p>Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers.</p> <p>Ablution facilities are to be serviced weekly or more frequently if required.</p>	<p>Availability of adequate, clean and hygienic sanitary facilities (toilets) on the construction site</p>	<p>Site Manager</p>

		<p>Toilet paper must be provided at all times.</p> <p>Defecating / urinating anywhere other than in the toilets should be prohibited.</p>		
<p>Soil and groundwater pollution from leaking or broken sewerage pipes.</p>	<p>To prevent soil and groundwater pollution from leaking or broken sewerage pipes</p>	<p>Ablution facilities should be maintained to prevent blockage and leakages.</p> <p>Create employee awareness about the proper use of ablution facilities and the importance of proper hygiene. No cigarette butts, fat, oil, paper towels etc. may be disposed of into toilets or washbasins.</p>	<p>Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed</p>	<p>Site Manager</p>

SECTION E: SOCIO-ECONOMIC

Table 7:5: Mitigation measures pertaining to Socio Economic impacts

Sources of impacts:				
<ul style="list-style-type: none"> ✓ Unfair labour practices and unwillingness to capacitate and recruit locals ✓ Lack of awareness on HIV-AIDS ✓ Drug and alcohol abuse 				
Impact Description	Objective	Mitigation Measures / Management Actions	Indicators for Monitoring and Compliance	Responsible Party
Employment opportunities for Locals	Enhance benefits to the local community	Recruit locals for unskilled labour. It should be specified in the contractor's contract that all positions shall only be filled by non-locals if it can be demonstrated that the required capacity is not available locally Where possible, procure materials from local suppliers.	Employee structure and proportion of local employment	Site Manager
Excessive working hours	Adhere to the Labour Act No. 11 of 2007	Adhere to prescribed working hours as per the Namibian Labour laws and regulations. Provision for overtime or compensatory time off for long hours worked	Verification of working hours against the labour Act Overtime recording and payment data	Site Manager
Alcohol abuse and Drug use	Reduce alcohol abuse and prevent drug use	Warn the employees against the use of alcohol and drug at the site (spot dismissal) Provide awareness on the dangers and health impacts of alcohol and drug use	Drunk / Misbehaving employees Monitoring records for alcohol / drug presence at the site	Site Manager

HIV / AIDS	Reduce HIV / AIDS (project should not become HIV transmission hotspot)	Provide HIV / AIDS awareness at induction and avail condoms to enhance accessibility (e.g in toilets)	Availability of condoms in toilets	Site Manager
Security	Orientation of workers about security for both equipment and them	Orientate all staff about the security of equipment and themselves & provide contact numbers for Police and other emergency services e.g. Ambulance	Proof of security orientation and emergency contact numbers	Site Manager

SECTION F: CULTURAL HERITAGE

Table 7:6: Mitigation measures pertaining to Cultural Heritage impacts

Sources of impacts:				
✓ Disregard of Cultural Heritage and artefacts				
Impact Description	Objective	Mitigation Measures/	Monitoring & Compliance Indicators	Responsible Party
Heritage Resources / artefacts	Reduce the impacts of the Solar PV construction and associated earthworks on heritage resources / artefacts	Heritage remains or artefacts discovered on site must be reported to the National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461)	Sighting report/s of heritage resources / artefacts	Site Manager
		No artefacts must be removed or be interfered with prior to authorisation from the Namibian National Heritage Council (NHC) Recovery of heritage remains or artefacts discovered and removal thereof should be directed by the National Museum		

8. REHABILITATION

8.1 Importance of Rehabilitation

Socio-economic development is very important for our livelihood and provides services, income and employment opportunities, and hence activities such as renewable energy and clean energy developments are vital and necessary for development.

However, such developmental activities should be conducted in a thoughtful and forward-looking manner. In other words, developmental activities, should consider the future land use after such activity has come to an end. Therefore, to ensure that the land remains valuable for other land uses in the future, rehabilitation should be part and parcel of such developmental activity right from the beginning and throughout the project lifespan.

8.2 What is Rehabilitation?

Rehabilitation is the process of repairing and taking all the necessary actions to limit, minimize and mitigate the damage caused by the developmental activity, in-order to make the land suitable for other uses or to simply beautify the affected area (so that it does not become an eyesore). Rehabilitation can also be referred to as the measures taken to repair damaged environments (example refilling of excavated pits with the overburden, re-vegetating, removal of unwanted infrastructure, cleaning up pollution etc).

8.3 Designing a Rehabilitation Plan

A rehabilitation plan refers to a set of steps or measures to be taken in-order to ensure that negative impacts associated with the development at hand are mitigated. This however requires prior planning and integration of rehabilitation activities throughout the project lifespan. Meaning, rehabilitation measures should be taken right from the beginning of the project.

The environmental characteristics of an area where a project is located plays a vital role in designing a rehabilitation plan.

8.4 Conclusion

Construction activities should be undertaken in a responsible and environmentally friendly manner. Although balancing the demands of development and nature is not always clear cut, the importance of minimal disturbance to the natural environment is of utmost importance to safeguard the environment

SECTION G: REHABILITATION

Table 7:7: Potential impacts and Mitigation measures pertaining to Rehabilitation

Sources of impacts:				
<ul style="list-style-type: none"> ✓ Landscape alteration due to lack of rehabilitation ✓ Biodiversity loss due to lack / poor rehabilitation ✓ Loss of topsoil due to lack of restoration measures ✓ Steep edges of and construction pits may become a death trap for animals ✓ Waste (Left over of broken equipment, material offcuts etc) 				
Impact Description	Objective	Mitigation Measures/	Indicators for Monitoring and Compliance	Responsible Party
Habitat alteration and permanent environmental scars of the and construction operations	To minimize habitat alteration and environmental scars	Limit environmental damages and re-use e.g. the overburden may be collected and piled and used for re-filling of pits Plant indigenous trees / grass to fill the gaps for trees removed during construction.	Re-filling of and construction pits with the overburden Indigenous Trees planted	Site Manager
	Landscaping	Landscaping – refers to re-shaping man-made landforms to blend in with the environment and in order to limit the damage to the natural landscape.	Landscaping efforts and modification towards natural state	Site Manager
Waste discarded in the environment (all over the place)	Clean-up	Remove any foreign objects (including infrastructure), that is not needed at site upon project completion.	Clean-up after project closure	Site Manager

9. CONCLUSION

9.1 Conclusion

The EMP recommends measures to be implemented by the Proponent, the contractor and sub-contractors to manage the proposed construction and operation of the Solar PV Plant and associated activities in accordance with the provisions of the Environmental Management Act and EIA regulations.

In-addition, the aim of the EMP is to ensure legal compliance to prevent environmental fatal flaws as mitigation for any impacts arising from the construction process at the end of the and construction phase.

Non-compliance against the EMP is punishable and specific responsibilities has been assigned to role players in-order to ensure that the EMP is implemented. The key role-players (ECO, Proponent and Site Manager (representing Contractor) as defined under section 4 should:

- **Read** the EMP (particularly the Site Manager) and ensure that they are fully conversant with provisions of the EMP,
- If need be, **Ask for clarity** from the Environmental Assessment Practitioner (EAP), Environmental Compliance Officer (ECO) or relevant authority,
- Ensure implementation of the recommended mitigation measures, and
- Communicate defaults / challenges to the ECO as soon as possible.

It is recommended that an Environmental Control Officer (ECO) should monitor (conduct periodic and unannounced EMP audits) throughout the development phase, in-order to ensure compliance in-accordance with the mitigation measures.

9.2 Recommendations

- i. If challenges / negative aspects arise, explore alternatives and adopt best practises.
- ii. Collaborate with MEFT (ECO) and other authorities to ensure environmental protection and socio-economic growth.
- iii. Ensure adequate implementation of the EMP
- iv. Undertake bi-annual environmental performance audits

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