



Excel Dynamic Solutions (Pty) Ltd

ENVIRONMENTAL MANAGEMENT PLAN

FOR

THE ESTABLISHMENT OF THE GREEN HYDROGEN & METHANOL, SOLAR & DESALINATION PLANT & OTHER ASSOCIATED INFRASTRUCTURE LOCATED IN HENTIESBAY, ERONGO REGION

ENVIRONMENTAL MANAGEMENT: FINAL DRAFT

ECC APPLICATION :007407



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1 INTRODUCTION

1.1 Project Background

Excel Dynamic Solutions (Pty) Ltd (The Consultant) has been appointed by Ugab Power Reserve Pty Ltd (*The Proponent*) to act on their behalf in obtaining the Environmental Clearance Certificate (ECC) for the proposed development of the green hydrogen, methanol, solar and desalination plant and other associated infrastructure located near Henties in the Erongo Region. The proposed site (centre coordinates: 22°06'26"S 14°18'42"E) covers an area of 3,500 hectares, within the Henties Bay Town & Townland No.133 as shown in Figure 1.

The proposed development and its associated facilities are among the listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC). Thus, it is subjected to an ECC, to be issued by the Ministry of Environment, Forestry and Tourism (MEFT) under the department of Environmental Affairs. Subsequently, to ensure that the proposed activity complies with national environmental legislation, the project Proponent appointed an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd, to undertake the required Environmental Assessment (EA) process and apply for the ECC on their behalf.

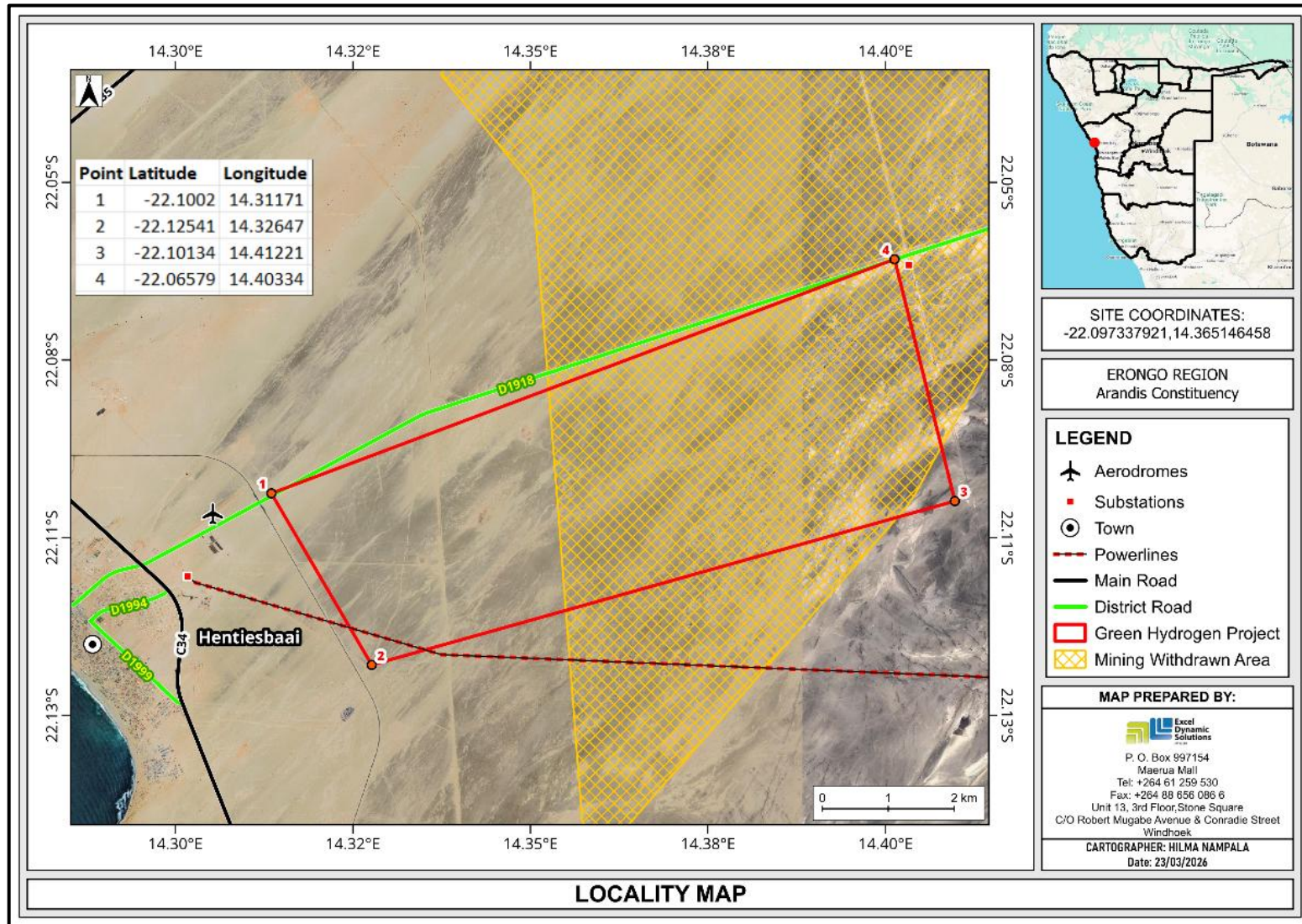


Figure 1: The locality map of the proposed site

In terms of the Namibian Environmental Management Act (EMA) No. 07 of 2007, Section 27 (2j), Government Notice No. 29, Section 6 and Government Notice No. 30, the proposed project constitutes several listed activities that require an ECC from the Department of Environmental Affairs (DEAF) of MEFT. The relevant listed activities as per EIA regulations are:

Listed Activity Category (EIA Regulations, 2012)	Relevant Listed Activity Description	Project Component Triggering the Activity
Energy Generation, Transmission and Storage Activities	The generation of electricity and the construction of facilities for the generation, transmission and supply of electricity	Construction and operation of a solar power plant, substations and associated powerlines for the Green Hydrogen and Methanol Facility
Industrial and Manufacturing Activities	The construction and operation of industrial-scale manufacturing and processing plants	Construction and operation of the green hydrogen production facility, electrolyzers, methanol synthesis plant and associated industrial infrastructure
Hazardous Substance Treatment, Handling and Storage	The storage, handling, processing or disposal of hazardous substances and waste	Storage and handling of hydrogen, methanol, chemicals, fuels and reagents, as well as the generation of hazardous waste during construction and operation
Water Resource Developments	The abstraction of water for industrial use, the construction and operation of desalination plants, and the discharge of effluent	Abstraction of seawater, construction and operation of a desalination plant, and discharge of brine into the marine environment
Infrastructure Development	The construction of roads, pipelines, bulk supply infrastructure and related facilities	Construction of access roads, internal roads, water intake and discharge pipelines, hydrogen and methanol pipelines, transmission lines and ancillary infrastructure
Land Use Change and Development	The rezoning or transformation of land and large-scale development activities	Change of land use from its current designation to industrial use for the establishment of the project

This statutory document has been prepared in accordance with Section 8 of the EMA (No. 7 of 2007). The compilation of this EMP is one of the requirements (scope of work) presented to Excel Dynamic Solutions (Pty) Ltd by the Proponent. It is required of the Environmental Consultant to comply with the EMA and provide for the following:

- Prepare an explicit Environmental Management Plan to be used as a guideline to monitor compliance with the recommendations stipulated in the EIA and to assist in managing and monitoring activities throughout the construction of the proposed development.
- The Environmental Consultant must clearly elucidate in the EMP the roles and responsibilities of the Proponent, the contractors, and any other identified stakeholders.

Aim of the Draft Environmental Management (EMP)

Regulation 8(j) of the EIA Regulations (2012) requires that a draft Environmental Management Plan (EMP) shall be included as part of the Environmental Assessment (EA). A '**Management Plan**' is defined as:

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

An EMP is one of the most important outputs of the EA process, as it synthesises all the proposed management & mitigation, and monitoring actions, set to a timeline with specific assigned responsibilities. It provides a link between the impacts identified in the EA process and the required mitigation measures to be implemented during the construction phase of the proposed development. It is important to note that an EMP is a statutory document, and a person who contravenes its provisions may face imprisonment and/or a fine. This EMP is a living document and can be amended to adapt to address project changes and/or environmental conditions, and feedback from compliance monitoring.

The purpose of this document is, therefore, to guide environmental management throughout the different phases of the proposed development activities, namely: the pre-development (site acquisition and preparation) phase, the construction phase, the construction closure phase, and the project setup.

Environmental Monitoring Requirements: To support and ensure that the proposed mitigation measures are achieving the desired results, a monitoring plan must be implemented alongside the mitigation plan.

This draft EMP will be used by the Proponent, employees and/or contractors to provide management measures to be undertaken during construction and setting up the related activities, to address the environmental impacts identified in the scoping report and ensure that the impacts on the environment are avoided or limited if they cannot be avoided completely.

Appointed Environmental Assessment Practitioner

To fulfil the requirements of the EMA and its 2012 EIA Regulations, the Proponent appointed Excel Dynamic Solutions (Pty) Ltd (EDS), an independent consulting company, to conduct the required EA process on the Proponent's behalf. This draft EMP will be submitted as part of an application for the proposed development to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF), at the Ministry of Environment, Forestry and Tourism (MEFT).

Environmental Assessment Legal Requirements

The content of the EMP must meet the requirements of Section 8 (j) of the EIA Regulations. The EMP must address the potential environmental impacts of construction activities throughout the proposed development life cycle. It must also include a system to assess the effectiveness of monitoring and management arrangements after project implementation.

The Proponent, therefore, has the responsibility to ensure that the proposed development activities and the EA process conform to the principles of the EMA, and to ensure that employees act in accordance with such principles. **Table 1** below lists the requirements of an EMP as stipulated by Section 8(e) of the EIA Regulations, primarily on specific approvals and permits that may be required for the activities required of the proposed development.

Table 1: Applicable legal requirements and permits for the activities of the

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Environmental Management Act (EMA) (No 7 of 2007)	Requires that projects with significant environmental impacts undergo an environmental assessment process (Section 27). Details the principles which are to guide all EIAs.	The EMA and its regulations should inform and guide this EA process. Should the ECC be issued to the Proponent, it should be renewed every 3 years, counting from the date of issue. Contact details at the Department of Environmental Affairs and Forestry (DEAF),

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Nature Conservation Amendment Act, No. 3 of 2017:	National Parks are established and gazetted in accordance with the Nature Conservation Ordinance, 1975 (4 of 1975), as amended. The Ordinance provides a legal framework with regard to permission to enter a state-protected area, as well as requirements for individuals who damage objects (geological, ethnological, archaeological, and historical) within a protected area. Though the Ordinance does not specifically refer to any development as an activity within a protected area (PA) or recreational area (RA), it does restrict access to PAs and prohibit certain acts therein, as well as the purposes for which permission to enter game parks and nature reserves may be granted.	<p>The Proponent will be required to enhance biodiversity conservation and maintain the ecological integrity of the Project Site area.</p> <p>The Proponent will also be required to comply with the existing and planned local operational management plans, regulations and guidelines.</p>
Electricity Act, 2007	Regulates the energy sector in Namibia, including generation, transmission, and distribution of electricity.	<ul style="list-style-type: none"> • Depending on the project's energy sources and potential for on-site generation, compliance with this act might be necessary. • The act may also on energy efficiency measures

<p>The Parks and Wildlife Management Bill of 2008:</p>	<p>Aims to provide a regulatory framework for the protection, conservation, and rehabilitation of species and ecosystems, the sustainable use and sustainable management of indigenous biological resources, and the management of protected areas, to conserve biodiversity and to contribute to national development.</p>	<p>conservation. The duty of care must be applied to soil conservation, and management measures must be included in the EMP.</p>
<p>Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)</p>	<p>Regulation 3(2)(b) states that “No person shall possess or store any fuel except under authority of a license or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”</p>	<p>The Proponent should obtain the necessary authorisation from the MME for on-site fuel storage.</p>
<p>Forestry Act 12 of 2001, Amended Act 13 of 2005</p>	<p>Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22(1)). The Act prohibits the removal of and transport of various protected plant species.</p>	<p>Should there be protected plant species known to occur within the project site, they are required to be removed, and a permit should be obtained from the nearest Forestry office (Ministry of Environment, Forestry and Tourism). (MEFT)) before removing them. Mr. Johnson Ndokosho (Director of Forestry Division)</p>

National Heritage Act No. 76 of 1969	Call for the protection and conservation of heritageresources and artefacts.	Should any archaeological material, such as bones, old weapons/equipment, etc., be found on the site, work should stop immediately, and the National Heritage Council of Namibia must be informed as soon as possible. The Heritage Council will then decide to clear the area or decide to conserve the site or material.
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Draft EMP Limitations

This EMP has been drafted with the acknowledgement of the following limitations:

- This EMP has been drafted based on the Environmental Assessment (EA) conducted for the proposed development.
- The mitigation measures recommended in this EMP document are based on the risks/impacts in the ESA Report, which were identified based on the project description as provided by the Proponent, site investigation and public input. Should the scope of the proposed project change, the risks/impacts will have to be reassessed and mitigation measures provided accordingly.

EMP ROLES AND RESPONSIBILITIES

The Proponent is ultimately responsible for implementing the EMP. However, the Proponent may delegate this responsibility at any time, as they deem necessary during the project phases. The roles and responsibilities of all delegates/parties involved in the effective implementation of this EMP are set out below:

Competent Monitoring Authority:

Department of Environmental Affairs and Forestry (DEAF, MEFT))

The DEAF is responsible for enforcing compliance with the EMA, its regulations and full implementation of this EMP. The competent authority also reviews biannual reports and grants ECC renewal after 3 years.

The Proponent or Proponent's Representative (PR)

If the Proponent does not personally manage all aspects and phases' activities referred to in this EMP, they should assign this responsibility to a suitably qualified individual referred to in this plan as the Proponent's Representative (PR). The PR may be appointed to manage all phases of the project, or only the EMP aspects. The PR's responsibilities may include:

- Managing the implementation of this EMP and updating and maintaining it when necessary.
- Management and monitoring of individuals and/ or equipment on-site in terms of compliance with this EMP.
- Issuing fines for contravening EMP provisions.

Site Manager (as appropriate)

This individual will be responsible for ensuring that the proposed development activities of the project are completed on time. The site Manager's duties and responsibilities will include:

- Ensure that relevant commitments contained in the EMP Action Plans are adhered to.
- Ensure relevant staff are trained in procedures entailed in their duties.
- Maintain records of all relevant environmental documentation for the project.
- Reviewing the EMP annually and amending the document when necessary.
- Issuing fines to individuals who may be in breach of the EMP provision and, if necessary, removing such individuals from the site.
- Cooperate with all relevant interested and affected parties/stakeholders.
- Development and management of schedules for daily activities.

Environmental Control Officer (ECO)

The Proponent may assign the responsibility of ensuring EMP compliance throughout the project life cycle to a designated member of staff or an external qualified and experienced person, referred to in this EMP as the Environmental Control Officer (ECO). The ECO will have the following responsibilities:

- Management and facilitation of communication between the Proponent, PR and Interested and Affected Parties (I&APs) regarding this EMP.
- Conducting site inspections (recommended frequency is monthly or weekly, as recommended – please refer to Table 3) of all areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP).
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP.
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP.
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.
- Ensuring that the development activities on site are conducted in accordance with the International Organisation for Standardisation (ISO) standard 14001: 2015 (environmental management system).

Archaeology: Chance Finds Procedure (CFP) Implementation Roles

The following personnel have been assigned responsibilities as per the Chance Finds procedure (Appendix 1):

- **Operator:** To exercise due caution if archaeological remains are found.
- **Foreman:** To secure the site and advise management timeously.
- **Superintendent:** To determine the safe working boundary and request an inspection.
- **Archaeologist:** To inspect, identify, advise management, and recover remains.

The Proponent should assess these commitments in detail and should acknowledge their obligation to the specific management actions detailed in the Tables under the following sections.

ENVIRONMENTAL MANAGEMENT & MITIGATION MEASURES

Management of Key Potential Adverse Environmental Impacts

From the assessment conducted, the following key potential negative impacts have been identified and are summarized below:

Impact Type	Summary of Impacts
Positive Impacts	<ul style="list-style-type: none">• Promotion of renewable energy through the use of solar power for green hydrogen and methanol production, supporting Namibia's low-carbon transition.• Reduction of greenhouse gas emissions compared to conventional fossil-fuel-based production methods.• Economic development through job creation during construction and operation phases.• Employment creation, skills development and technology transfer.• Improved water security by using desalinated seawater instead of limited freshwater resources.• Export and revenue generation through the production of green fuels for domestic use and international markets.• Support for local businesses through procurement of locally available goods and services.
Negative Impacts	<ul style="list-style-type: none">• Temporary environmental disturbance during construction, including habitat loss, noise and increased activity.• Potential marine impacts from seawater abstraction and brine discharge if not properly managed.• Health and safety risks associated with the storage and handling of hydrogen, methanol and other hazardous chemicals.• Land use change and alteration of landscape character due to industrial development.• Visual and social impacts from large-scale infrastructure such as solar plants, pipelines and industrial facilities.• Possible impacts on archaeological or cultural heritage resources within the project area.

Aim of the Environmental Management Plan Actions

The aim of the EMP's management actions is to avoid the above-listed potential negative impacts, where possible. Where impacts cannot be avoided, measures are provided to reduce their significance.

Management actions recommended for the potential impacts rated in the ESA carried out for the development activities were based on the following stages (phases):

- Pre-development and construction phases (**Table 2**)
- Monitoring during operation (**Table 3**)
- Construction closure phases (section 4)

The responsible person(s) should assess these actions in detail and acknowledge their commitment to the specific management actions detailed in the phases given under the following subsections.

1.1 Pre-development and construction Phase Management Action Plans (Mitigation Plan)

The management action plans recommended for this phase are presented in **Table 2** below.

Table 2: Management and mitigation action plans for the pre-development and construction phases

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
PRE-DEVELOPMENT PHASE						
EMP implementation and training	Lack of EMP awareness and implications thereof	<p>-A Comprehensive Health and Safety Plan for the project activities should be compiled. This will include all the necessary health, safety, and environmental considerations applicable to respective works on sites.</p> <p>An EMP non-compliance penalty system should be implemented on site.</p> <p>The Proponent should appoint an ECO to be responsible for managing the EMP implementation and monitoring.</p>	<p>-All required Plans and systems are compiled and in place and the Environmental Control Officer (ECO) is appointed</p>	Proponent	EMP Implementation Plans and Systems	Pre-development works
Authorizations	Lack of Agreements, Permits/ Licenses	<p>-All the required agreements and licenses or permits should be applied for and signed, respectively, before commencement of work on the site, or as required.</p> <p>-The permits and agreements referred to herein include:</p> <ul style="list-style-type: none"> o Land acquisition. 	<p>-Applicable permits and licenses to be obtained from relevant authorities and kept on site for record-keeping and future inspections.</p> <p>-Agreements/permits signed and obtained on time,</p>	Proponent	<p>Proponent</p> <p>Respective authorities and services provider(s)</p>	Prior to construction works

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<ul style="list-style-type: none"> o waste management disposal permits from the relevant facility operator/owner o Water supply agreements. o Electricity supply permit o Onsite fuel storage permit from MME for any petroleum stored onsite. o Water abstraction permit 	<p>months prior to construction and setting up, or the commencement date of works on site.</p>			
Communication between the Proponent and other neighbouring land users and custodians	Lack of communication (proper liaison) between other land users and the Proponent with regard to land use	<p>-The Proponent should appoint a Public Relations Officer (PRO) to liaise with the land users.</p> <p>-A clear communication procedure/plan, which should include a grievance mechanism.</p>	<p>A PRO is appointed</p> <p>-Ongoing Stakeholder Consultation throughout the project cycles, when and as required.</p> <p>PRO contact details to be provided to the affected landowners</p>	Proponent	<p>PRO</p> <p>Complaint's logbook</p>	<p>PRO appointment (Before project activities) and their responsibilities throughout the project activities</p>
Employment	Creation of employment opportunities	-Non-skilled labour should be sourced from the locally affected area (people from the local communities), in accordance with procedures approved by the relevant authorities.	-Number of locals employed for pre-development and Construction and setting up activities	Proponent in collaboration with the Site Manager (if necessary)	Record of employees	Pre-project activities and when necessary, throughout

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>-Preference of local people for employment for jobs should be implemented, i.e., permanent residents from the surrounding areas should be employed for the unskilled labour preferentially to out-of-area people (outsiders) where possible. Out-of-area employment should be justified, for example, by the unavailability of local skills only.</p> <p>-Equal opportunity should be provided for both men and women, when and where possible.</p>				
Specialised procurement of services	Contractors and services	-All services related to development activities, such as construction, that the Proponent may need; preference should be given to local providers of such services. If not available locally, the services search should be extended to a regional level (Erongo Region), nationally, and, lastly, internationally.	Number of hired contractors.	Proponent Site Manager	Record of hired or contracted companies or services providers	Pre-project activities and ,when necessary, throughout
CONSTRUCTION AND OPERATION PHASE						
EMP implementation and training	Lack of EMP awareness and implications thereof	<p>-EMP trainings should be provided to all new workers on site.</p> <p>-All site personnel should be aware of the necessary health, safety,</p>	Compliance monitoring is conducted biannually and should be recorded.	ECO	Bi-annual reports	Throughout the Development phase and as required

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>and environmental considerations applicable to their respective work.</p> <p>-The implementation of this EMP should be monitored.</p> <p>The site should be inspected, and a compliance audit conducted monthly throughout the project activities.</p> <p>An EMP non-compliance penalty system should be implemented on site.</p>			Records of EMP training conducted.	
Communication between the Proponent and other neighbouring land users and custodians	Lack of communication (proper liaison) between locals and regard to land use.	The Proponent should compile a clear communication /plan that includes a grievance and response mechanism.	<p>PRO is part of the project personnel.</p> <p>-Community grievances addressed to their satisfaction</p>	PRO	<p>Complaint's logbook</p> <p>PRO contact details to be provided to the affected locals.</p> <p>Records of stakeholder' consultation</p> <p>Land acquisition agreement conditions</p>	Throughout the development activities
Water Resources Use	Over-abstraction (water demand and availability)	- Water reuse/recycling methods should be implemented as far as practicable, such that the water used for the cleaning of project equipment, if possible.	Water supply agreements	Proponent	<p>Water supplier</p> <p>Water supply agreements</p>	Once-off supply agreement

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>-Water storage tanks (if there are any on-site) should be inspected daily to ensure that there is no leakage, resulting in wasted water on-site.</p> <p>-Water conservation awareness and saving measures training should be provided to all the project workers in both phases so they understand the importance of conserving water and are held accountable.</p> <p>- Abstract a reasonable amount of water for desalination</p>	<p>Proof/recordings/quantification of water-saving efforts.</p> <p>Water supplier</p> <p>-Water permits</p> <p>-inspection of water storage tanks on site</p>	<p>Site Manager</p>	<p>Proponent</p> <p>Water storage tanks on site</p>	<p>Throughout the project phase</p>

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
Soils	Physical soil/land disturbance and loss of topsoil	<p>-Overburden soils and rocks should be handled more efficiently during operations to avoid erosion when subjected to erosional processes.</p> <p>-Soils that are not within the intended and targeted footprints of the site should be left undisturbed, and soil conservation implemented as far as possible.</p> <p>-Project vehicles and machinery should stick to access roads provided and or meant for the project operations, but not to unnecessarily create further tracks on site by driving everywhere, resulting in soil compaction.</p> <p>-The project footprint area should not be cleared entirely, and the vehicles and equipment must be placed in such a way that soil disturbance is minimised, and the site should be rehabilitated after each on-site work.</p>	<p>No proliferation of informal vehicle tracks.</p> <p>No new erosion gullies.</p>	ECO	<p>Proponent</p> <p>All personnel</p> <p>Complaint's logbook</p>	Throughout the project phase
Soils and water resources	Soils and water resources pollution	-Oil and wastewater spill control preventive measures should be in place on-site for the management of soil	No complaints of pollutants on the soils and eventually in the	ECO	Complaint's logbook	Throughout the project phase

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>contamination, thus preventing and minimising contamination from reaching water resources. Some of the soil control preventive measures that can be implemented include:</p> <ul style="list-style-type: none"> -Spill control preventive measures should be in place on site to manage soil contamination, thus preventing and or minimising the contamination from reaching water resources bodies. -All project employees should be sensitized about the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures. -The Proponent should develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible. -Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired. -Project machines and equipment should be equipped with drip trays 	<p>water due to development activities</p> <p>No visible oil spills on the ground or pollution spots.</p> <p>-Waste containers provided at work sites and campsites</p>		<p>Non-permeable material to cover the ground surface in areas where hydrocarbons and potential pollutants are utilized.</p>	

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>to contain potential oil spills when operated on-site.</p> <p>-Polluted soil should be removed immediately and put in a designated waste type container for later disposal.</p> <p>-Drip trays must be readily available on this trailer and monitored to ensure that accidental fuel spills along the tank trailer path/route around the sites are cleaned on time (soon after the spill has happened).</p> <p>-Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.</p> <p>-Washing of equipment contaminated with hydrocarbons, as well as the washing and servicing of vehicles with hydrocarbons, should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources.</p> <p>-Toilet water should be treated using the long drop toilet system and periodically emptied out before reaching capacity and</p>				

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		transported to a wastewater treatment facility.				
Biodiversity	Loss of Fauna and Flora	<p>Fauna</p> <ul style="list-style-type: none"> -Access roads (even existing ones) should be utilised appropriately in a manner that disturbs as few land areas as possible, thus minimising faunal habitat destruction. -Breeding sites for faunal species that are found within the site and nearby should not be disturbed. -Environmental awareness on the importance of faunal preservation should be provided to the workers and contractors. <p>Flora:</p> <ul style="list-style-type: none"> -The Proponent should avoid unnecessary removal of vegetation, thus promoting a balance between biodiversity and their construction works. -Movement of vehicles and machinery should be restricted to existing roads and tracks to prevent unnecessary damage to the vegetation. 	<p>No disturbance to unmarked areas.</p> <p>No complaints from locals regarding unauthorised vegetation removal or tree felling.</p> <p>No intentional disturbance and destruction of site vegetation and faunal species</p> <p>Visible preservation of onsite vegetation</p>	ECO	<p>Barricading tape (to indicate working areas)</p> <p>Complaint logbook</p>	Throughout the project phase

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>-Even if a certain vegetation is found along the sites, this does not mean that it should be removed. Therefore, care should be taken without destroying the site vegetation.</p> <p>-Design access roads appropriately in a manner that disturbs much as possible.</p> <p>-Make use of the existing road network as much as possible and avoid off-road driving, thus minimizing onsite floral destruction.</p> <p>-Vegetation clearing to be kept to a minimum. The vegetation of the site is largely low and open and therefore ,vegetation clearing should only be applied where necessary and within the site footprint.</p> <p>-Environmental awareness on the importance of floral biodiversity preservation should be provided to the workers and contractors.</p> <p>Completely eradicate invasive species in an environmentally friendly manner.</p>				
Land Use	Conflict between land	-Construction activities should not in any way hinder the existing land use	Land access and use permits/authorisations.	PRO	Proponent	Throughout the project phase

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
	uses construction and setting up activities	uses, but rather promotes coexistence throughout project operations while respecting other land users. -The Proponent should ensure that their activities comply with the conditions set by the competent, regulatory, and affected authorities, such that the proposed construction activities do not severely impact the different existing activities around the site.	Compliance with conditions set within operational permits by relevant and affected authorities. Little to no complaints of significant interference from the neighbouring land users	Proponent ECO	Relevant authorities (MEFT, MME, etc.)	
Road use and safety	Increase in vehicular traffic flow.	-Vehicles should be driven only on existing access roads and necessary temporary accessroads only leading to the site; no new roads should be constructedwhere possible. -The transportation of project materials, equipment and machinery should be limited to once or twice a week only, but not every day. -The heavy truck loads should comply with the maximum allowed limit while transporting materials and equipment/machinery on the public and access roads. -The carted water into the area from outside the project area	No complaints from members of the public regarding vehicular traffic issues related to the project activities. All personnel operating the project vehicles and machinery are appropriately licensed and in possession of validdriving licenses. Demarcated areas for parking, offloading,and loading zones are on site.	Proponent ECO	Number of project vehicles on site Names of drivers Frequency of water carting	Throughout the project phase Site access permit (s) to be applied for and obtained prior to commencement of project works

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>should be done once or twice a week in container that can supply and store water for most of the week, thus reducing the number of trucks on the road.</p> <p>-Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses.</p> <p>Vehicle drivers should adhere to the road safety rules.</p> <p>-Drivers should drive slowly (40km/hour or less), and on the lookout for animals and people.</p> <p>-Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents because of mechanical faults of vehicles.</p>	<p>If required, site access road permits obtained, and requirements fulfilled.</p> <p>No creation of unnecessary tracks on site.</p>			
Local services and infrastructure	Overuse and maintenance	<p>-The heavy trucks transporting materials and services to site should be scheduled to travel at least twice or thrice a week to avoid daily travelling to site, unless on cases of emergencies.</p> <p>The heavy trucks transporting materials and services to site should be scheduled to travel at least twice or thrice a week to</p>	-Visible efforts of maintaining access and community roads by the Proponent	Proponent Site Manager	Road clearing machinery (bulldozers)	Throughout the project phase, when necessary

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Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		avoid daily travelling to site, unless on cases of emergencies.				
Occupational Health and safety	General health and safety associated with project activities in both phases	<p>-Induction must always be offered to visitors on site and be provided with PPE before entering the site</p> <p>-The Proponent should commit to and make provision for bi-annual full medical check-up for all the workers at site to monitor the impact of project related activities on them (workers).</p> <p>-As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs i.e working and production of methanol and the desalination plant equipment.</p> <p>-employees should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc.</p> <p>-Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible.</p>	Comprehensive health and safety plan for all construction activities compiled.	Proponent Site Manager ECO	Occupational Health and Safety Personnel Health and Safety Trainings First aid kits Trained worker to administer first aid	Throughout the project phase and trainings offered as and when required

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Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>-An emergency preparedness plan should be compiled, and all personnel appropriately trained.</p> <p>-Workers should not be allowed to drink alcohol prior to and during working hours, nor allowed on site when under the influence of alcohol, as this may lead to mishandling of equipment, which results in injuries and other health and safety risks.</p> <p>-The site areas that are considered temporary risks should be equipped with "danger" or "cautionary" signs.</p>				

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Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
	<p>or heritage objects and sites</p>	<p>recognize “chance finds heritage” in the course of their work.</p> <p>-During the construction works, it is important to take note and recognise any significant material being unearthed and make the correct judgment on which actions should be taken (refer to CFP Appendix attached to the EMP).</p> <p>-A landscape approach to site management must consider culture and heritage features in the overall planning of construction infrastructures within and beyond the license boundaries.</p> <p>-The Proponent and Contractors should adhere to the provisions of Section 55 of the National Heritage Act in the event significant heritage and culture features are discovered while conducting works.</p> <p>-Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project Archaeological Management Plan (AMP)/EMP, compliance should be ensured.</p> <p>-An archaeologist or Heritage specialist should be onsite to</p>	<p>No-Go Areas avoided</p>	<p>ECO</p> <p>Operator</p> <p>Foreman</p> <p>Superintended</p> <p>Archaeologist</p>	<p>Flag tapes</p> <p>GPS (site marking)</p>	<p>up, and during construction.</p>

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Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>Monitor all significant earth-moving activities that may be implemented as part of the proposed project activities.</p> <p>-Show overall commitment and compliance by adopting a “minimalistic or zero damage approach”.</p>				
Littering and waste management (general waste and sanitation)	Environmental Pollution	<p>-Workers should be sensitized to dispose of waste manner and not to litter.</p> <p>-After each daily works, the Proponent should ensure that there are no wastes left on the sites.</p> <p>-All domestic and general project waste produced daily should be contained until such time as it will be transported to designated waste sites in the nearby town (Henties Bay Landfill).</p> <p>-No waste may be buried or burned on site or anywhere else.</p> <p>-Sewage waste should be stored as per the available sewage system supplied on site and regularly disposed of at the nearest treatment facility.</p>	<p>No visible litter around the project area</p> <p>Provision of sufficient waste storage containers</p> <p>Waste management awareness</p>	ECO	<p>Waste storage containers</p> <p>Waste disposal permits to municipalities.</p> <p>Environmental, Health and Safety Statements and Policy</p>	Throughout the project phase

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		<p>-Oil spills should be taken care of by removing and treating the soil affected by the spill.</p> <p>-A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.</p> <p>-Careful storage and handling of hydrocarbons on site is essential; therefore, it should be enforced.</p> <p>-Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater.</p>				
	Wastewater generated by on-site workers.	<p>-Provision of toilet facilities for workers (mobile/portable chemical toilet if possible).</p> <p>-Emptying of chemical toilets according to the manufacturer's specifications.</p>	Adequate toilet and basic ablution facilities on site.	Proponent ECO	<p>Chemical toilets</p> <p>Sewage removal operator</p> <p>waste treatment agents/chemicals</p>	Throughout the project phase

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
Air Quality	Dust generation	<p>-Vehicles should not drive at a speed of more than 40 km/h to avoid dust generation around the area.</p> <p>-Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers on site, where they are exposed to dust.</p> <p>-Excavating equipment should be regularly maintained to ensure excavation efficiency and to reduce dust generation and harmful gaseous emissions.</p>	<p>No complaints from the public about vehicle emissions and dust generation.</p> <p>Visible efforts to curb dust</p>	ECO	<p>Complaint's logbook</p> <p>Dust suppressant (Water)</p>	Throughout the project phase
Noise	Nuisance	<p>-Noise from project vehicles and equipment on the working sites should be at acceptable levels.</p> <p>-The construction times should be set such that no such activities are carried out during the night or very early in the mornings (to be limited between 8 am and 5pm on weekdays).</p> <p>-Construction hours should be restricted to between 08h00 and 17h00 to avoid noise and vibrations generated by equipment and the movement of vehicles before or after hours.</p>	<p>Complaints from neighbouring land users about excessive noise.</p>	ECO	<p>Complaint's logbook</p> <p>Noise protective equipment for workers</p>	Throughout the project phase

Draft EMP

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
		-When operating machinery on site, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.				
Social nuisance	Local properties disturbance and values	<p>-Any workers or site employees who will be found guilty of intruding on people's privately owned properties should be called in for a disciplinary hearing and/or dealt with as per their employer's (Proponent) code of employment conduct</p> <p>-The project workers should be advised to respect the community and locals' private properties, values, and norms.</p> <p>-No worker should be allowed to wander in people's private yards or fences without permission.</p> <p>-Out-of-area workers who may be employed (due to their unique work skills) on site should be sensitised on the importance of respecting the local values and norms.</p>	No complaints from stakeholders about property theft, disturbance, or intrusion	ECO	Grievance logbook Land access agreement conditions	Throughout the project phase
CONSTRUCTION CLOSURE PHASE						

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Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Resources	Timeline
Construction closure phase	Disturbance and damage to land	<p>-All drilled boreholes should be capped and backfilled.</p> <p>-All waste generated and stored on site during construction activities should be disposed of at the nearest solid waste management sites.</p> <p>-Any temporary setup on site should be dismantled as far as practicable.</p> <p>-Provision of both financial and technical resources for progressive construction closure.</p>	<p>Capped boreholes and backfilled pits</p> <p>No sign of waste or littering was seen on site or around the site areas.</p> <p>Carrying away of waste, and removal of vehicles and equipment from the site</p> <p>Campsite dismantled, and materials removed from the site.</p>	Proponent	<p>Excavators and other backfilling/demolishing machinery</p> <p>Record of boreholes drilled</p> <p>Waste containers on sites</p> <p>Records of finances set aside for project construction closure activities</p>	Progressive construction was done throughout the project phase.

1.3 Monitoring Action Plans (Monitoring Plan)

To support and ensure that the proposed mitigation measures are achieving the desired results, a monitoring plan must be implemented. The monitoring action plans recommended for planned construction works are presented in **Table 3** below.

Table 3: Management action plans for Monitoring

Environmental Feature	Impact	Monitoring Actions	Implementation responsibility	Frequent	Threshold	Action if the threshold is exceeded
Archaeology and Heritage	Presence or unearthing of archaeological or cultural heritage resources	To prevent the destruction of artefacts and sites. Preservation of all artefacts and sites that are discovered within the site boundary or around the project site area. Inspection of records of findings.	ECO Archaeologist	Daily	Unearthing of archaeological or cultural heritage resources	Cease all activities on site and wait for NHC to inspect the site and give further instructions / actions
Soils	Loss of topsoil	All measures should be considered to prevent the loss of topsoil	ECO and site Manager	weekly	Proliferation of new vehicle tracks	Rehabilitation of affected areas
Monitoring	EMP non-compliance	The ECO or the Proponent/Contractor should monitor the implementation of this EMP to ensure compliance. The ECO(s) should inspect the site throughout the construction period and after completion.	ECO	Daily	Increase in health, safety and environmental damage incidence	Daily safety talks, remedy the consequences
Biodiversity	Loss of biodiversity	Comply with marked no-go areas and avoid areas sensitive to any type of disturbance. Eradicate invasive species in an environmentally friendly manner. Clear only footprint areas to maintain as much of the remaining natural vegetation on site and to prevent loss of habitat (if so, advised by MEFT).	ECO Workers involved in this phase	Weekly	Vegetation clearance outside of marked areas.	Rehabilitation of affected areas to the satisfaction of the ECO

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Environmental Feature	Impact	Monitoring Actions	Implementation responsibility	Frequent	Threshold	Action if the threshold is exceeded
Health and Safety	Health and safety of the workers	<p>-Workers should be trained on how to handle materials and equipment on site (if they do not already know how to) to avoid injuries.</p> <p>-Construction equipment and materials transported to the site should be securely fastened to the vehicles (trucks and cars). This is to ensure that the materials and equipment do not fall off the vehicles and cause injuries to anyone during transport.</p> <p>- All personnel should be provided with appropriate personal protective equipment (PPE), such as gloves, masks, safety boots, safety glasses and hard hats, always during construction hours on site to prevent serious injuries or loss of life.</p> <p>-No employee should be allowed to drink alcohol to during workinghours as this may lead to mishandling of equipment, which results in injuries and other health and safety risks.</p>	<p>ECO</p> <p>Worker Involved in this phase</p>	Daily/Weekly	Health and safety incident	Remedy the consequences

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Environmental Feature	Impact	Monitoring Actions	Implementation responsibility	Frequent	Threshold	Action if the threshold is exceeded
Neighbouring land users to the site	Disturbance	The construction works schedule should be limited to normal working hours, between 08h00 and 17h00. This is to ensure that the generated noise does not become a nuisance to the neighbours.	ECO Site Manager	Weekly	A logged complaint about excessive noise	Revision of site activities
Waste	Environmental Pollution	-The site should always be kept tidy. All domestic and general construction waste produced daily should be cleaned and contained to prevent environmental pollution. -Separate waste containers (bins) for hazardous and domestic/general waste must be provided on site to avoid mixing of waste.	ECO All workers are involved in this phase.	Daily	Visible litter around project site A logged complaint	Clean-up of the affected areas and ensuring construction workers utilise the provided waste containers.
Transport	Transportation of workers to and from site	-Project workers will be transported, in an SUV, bus (or similar suitable passenger vehicle) to and from the site to ensure workers' safety. -No off-road driving	ECO	Daily	A logged Complaint about bad form of transport affecting occupational safety and health of workers	
Vehicular traffic safety	Increase in local traffic flow.	-All drivers of the project vehicles should of a valid and appropriate driving licenses to operate such vehicles.	ECO	Weekly	A logged complaint about traffic increase or damage to roads	Find alternative access roads for the team. Rehabilitation of affected roads

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Environmental Feature	Impact	Monitoring Actions	Implementation responsibility	Frequent	Threshold	Action if the threshold is exceeded
		<p>-Project vehicles should be in a roadworthy condition and serviced regularly to avoid accidents because of mechanical faults in vehicles.</p> <p>-Vehicle drivers should not be allowed to operate vehicles while under the influence of alcohol.</p> <p>-No heavy trucks or project related vehicles should be parked in biologically sensitive areas.</p>				

Construction Closure Phase

During operation, the project should implement an Environmental Management Plan (EMP) to ensure proper waste management, pollution prevention, and environmental monitoring. Waste must be separated, stored safely, and disposed of at approved facilities such as the Henties Bay Landfill. Measures should be in place to protect water resources, control noise and emissions, conserve biodiversity, and ensure worker health and safety, while maintaining ongoing engagement with local communities.

During closure, all infrastructure should be removed, and the site rehabilitated to a stable and natural condition. Waste, including hazardous materials, must be properly disposed of or recycled. Contaminated soils should be remediated, and disturbed areas re-vegetated with indigenous species. Post-closure monitoring should be conducted to ensure environmental stability, supported by adequate financial provision for rehabilitation.

ENVIRONMENTAL MONITORING AND REPORTING

To minimize the "medium" and uphold "low" significance ratings of impacts identified and assessed in the ESA report, monitoring reports are to be compiled and submitted to the DEAF for archiving on a bi-annual basis (every 6 months throughout the project operations) or as required by the Environmental Commissioner (as per the ECC conditions). This practice will make any considerations for ECC renewal easy as it nears expiration. Therefore, the Proponent should meritoriously monitor and submit the reports to the DEAF. The submission is not only done for record keeping purposes, but also in compliance with the environmental legislation.

CONCLUSIONS AND RECOMMENDATIONS

In the event that the Environmental Commissioner considers ECC issuance for the proposed development, it is recommended that an ECC for this project be granted, subject to the following recommendations:

- All mitigations provided in this Report and the management action plans in the EMP should be implemented, and monitoring should be conducted as recommended.
- All the necessary environmental and social (occupational health and safety) precautions provided should be adhered to.
- The monitoring of the implementation of mitigation measures should be conducted, applicable impacts' actions taken, reporting done and recorded as recommended in the Draft EMP.

The proposed construction and operation of the project has some sensitive environmental and social components that may be potentially affected, and therefore, potential negative impacts stemming from these activities were acknowledged, assessed and mitigation measures were made. The mitigation measures endorsed in the ESA report and management action plans provided in the draft Environmental Management Plan can be considered adequate to elude and/or reduce the risks to acceptable levels. Therefore, Excel Dynamic Solutions (Pty) Ltd assures that these measures are sufficient to enable environmentally sustainable and safe construction of the site. Therefore, it is recommended that written approval for the ECC may be issued on the condition that the provided management measures and action plans are effectively implemented on site and monitored. Predominantly, monitoring of the environmental components described in the ESA should be conducted by the Proponent and applicable Competent Authorities. This is to ensure that all potential impacts identified in this study, and any that might arise during the proposed development, are properly identified in time and addressed.

APPENDIX 1: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The “*chance finds*” procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The “chance finds” procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): “*a person who discovers any archaeological objectmust as soon as practicable report the discovery to the Council*”. The procedure for reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

The Manager/Supervisor must report the findings to the following competent authorities:

- National Heritage Council of Namibia (061 244 375)
- National Museum (061 276800),
- National Forensic Laboratory (061 240461).

Archaeological material must NOT be touched. Tampering with the materials is an offence under the Heritage Act and punishable upon conviction by the law.

Responsibility:

Operator: To exercise due caution if archaeological remains are found

Foreman: To secure the site and advise management timeously

Superintendent: To determine the safe working boundary and request inspection.

Archaeologist: To inspect, identify, advise management, and recover remains

Procedure:

Action by a person identifying archaeological or heritage material:

- a) If operating machinery or equipment, stop work
- b) Identify the site with flag tape
- c) Determine GPS position if possible
- d) Report findings to the foreman

Action by the foreman

- a) Report findings, site location and actions taken to the superintendent
- b) Cease any works in the immediate vicinity

Action by the superintendent

- a) Visit site and determine whether work can proceed without damage to findings
- b) Determine and mark the exclusion boundary
- c) Site location and details to be added to the project GIS for field confirmation by the archaeologist

Action by an Archaeologist

- a) Inspect site and confirm the addition to the project GIS
- b) Advise NHC and request written permission to remove findings from the work area
- c) Recovery, packaging and labelling of findings for transfer to the National Museum

In the event of discovering human remains

- a) Actions as above
- b) Field inspection by an archaeologist to confirm that the remains are human
- c) Advise and liaise with NHC and Police
- d) Recovery of remains and removal to the National Museum or the National Forensic Laboratory, as directed.