Namwaste Management Facility

Final Environmental Management Plan

Namwaste (Pty) Ltd

Prepared by:

SLR Environmental Consulting (Namibia) (Pty) Ltd

8 General Murtala Muhammed Ave, Eros, Windhoek

SLR Project No.: 720.09045.0008

MEFT Reference No: APP- 231110002454

9 September 2024

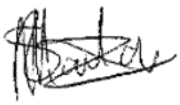
Revision: 03
Report No.: 03

Title	Namwaste Management Facility: Final Environmental Management Plan
Project Manager	Stephanie Strauss
Project Manager Email	sstrauss@slrconsulting.com
Author	Robyn Christians
Reviewer	Matthew Hemming
Keywords	EMP, waste management, Arandis
Status	Final
Report No.	03
SLR Company	SLR Consulting (Africa) (Pty) Ltd
MEFT Ref:	231110002454

Revision Record

Revision	Date	Prepared By	Checked By	Authorized By
01	9 August 2024	Robyn Christians	Matthew Hemming	Natalie Kohler
02	4 September 2024	Stephanie Strauss	Matthew Hemming	Natalie Kohler
03 (Final)	9 September 2024	Stephanie Strauss	Matthew Hemming	Natalie Kohler

Report Sign Off and Approvals



(Project Manager and author) **(Reviewer)**

Basis of Report

This document has been prepared by an SLR Group company with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Namwaste (Pty) Ltd (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

Table of Contents

Tables in Text

Figures in Text

Appendices

Terms and Description

Term(s)	Description
Construction / contractors camp	Is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;
Construction Phase	The activities pertaining to the preparation for and the physical construction of the proposed development.
Contractor	Persons/organisations contracted by the Developer to carry out parts of the work for the proposed project.
Environment	The environment is defined as the surroundings within which humans exist and that are made up of – (i) the land, water, and atmosphere of the earth; (ii) micro-organisms, plant, and animal life; any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Incident	An unexpected or sudden occurrence related to the Project, including major emissions, spills, fires, explosions, floods, or erosion leading to serious or potentially serious negative environmental impacts.
Hazardous Substance	Substances that have the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.
Hazardous Waste	Waste that belongs to any category of waste contained in *Annexure I of the Basel Convention on the control of transboundary movements of hazardous wastes and their disposal. Protocol on liability and compensation for damage resulting from transboundary movements of hazardous wastes and their disposal (Secretariat of the Basel Convention, April 2020).*
Independent Auditor	The person or entity who will conduct an environmental audit during the construction phase of the project according to the provisions of the Environmental Management Plan and Environmental Clearance Certificate (ECC).
Method Statement	A written submission by the Contractor to the Project Manager/Engineer in response to the specification or a request by the Project Manager/Engineer and ECO. The Method Statement must set out the plant, materials, labour and method the Contractor proposes using to carry out an activity. The Method Statement shall provide such detail that the Project manager/Engineer and ECO is able to assess whether the Contractor's proposal is in accordance with the Specifications, EMP and ECC and/or will produce results in accordance with this specification.
Operational Phase (Post Construction)	The period following the Construction Phase, during which the proposed development will be operational.
Rehabilitation	Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption.
Construction Manager	Person/organisation appointed by the Developer to oversee the work of all contractors.

Term(s)	Description
Solid waste	means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);
Spoil	Means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;
Topsoil	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

Acronyms / Abbreviations and Definitions

Acronym / Abbreviation	Definition
AIDS	Acquired Immune Deficiency Syndrome
B.Sc.	Bachelor of Science
CEP	Community Engagement Plan
CM	Compliance Officer/Manager
COVID	Coronavirus Disease
DEA	Directorate of Environmental Affairs
DMS	Disposal Management System
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EIA Regulations, 2012	Environmental Impact Assessment Regulations, 2012 (GN No.30 of 2012) Namibia
EIA Report	Environmental Impact Assessment Report
EMA	Environmental Management Act, No. 7 of 2007 (Namibia)
EMP	Environmental Management Plan
EMPA	Environmental Management Planning and Approvals
EPRP	Emergency Preparedness and Response Plan
ESMS	Environmental and Social Management System
EPCM	Engineering, Procurement and Construction Management
FPA	Fire Protection Agency
GBV	Gender Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GN	Government Notice
GWP	Groundwater Management Plan

Acronym / Abbreviation	Definition
HCS	Hazardous Chemical Substances
HIA	Heritage Impact Assessment
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IFC	International Finance Corporation
IRP	Integrated Resource Plan
ISO	International Standards Organization
IUCN	International Union for Conservation of Nature
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining Licence
MME	Ministry of Mines and Energy
MSDS	Material Safety Data Sheets
NCAA	Namibian Civil Aviation Association
NMF	Namwaste Management Facility
NNNP	Namib Naukluft National Park
NRA	Namibia Roads Authority
PCD	Pollution Control Dam
PS	Performance Standard
SDoD	Shutdown on Demand
SHE	Safety, Health and Environment
SIA	Social Impact Assessment
SLR	SLR Consulting (Namibia) (Pty) Ltd
S&EIA	Scoping and Environmental Impact Assessment
TIA	Traffic Impact Assessment
ToPs	Threatened or Protected species
VAT	Value Added Tax

1.0 Introduction

1.1 Project Background

Rent-A-Drum (Pty) Ltd (Rent-A-Drum) has been operating in the Namibian waste management sector for 34 years. The Rent-A-Drum Group was acquired by the Séché Environnement Group in 2023. The Séché Environnement Group owns a majority stake in the Rent-A-Drum Group, of which Namwaste (Pty) Ltd (Namwaste), is a subsidiary. Namwaste (Pty) Ltd is the applicant for the proposed Project.

The Séché Environnement Group, an established French-owned company, which has been in operation for 35 years and operates in 15 countries throughout the world is a major player in the circular economy and waste management, decontamination and emergency environmental services sectors. The Rent-A-Drum Group currently offers integrated waste management solutions and has an operational footprint in 6 of Namibia's regions, serving over 2 000 customers and employing approximately 550 full time staff members.

Currently Namibia as a whole is serviced by only two hazardous landfill sites. The Kupferberg facility in Windhoek reportedly has 2 years airspace remaining, and the facility in Walvis Bay is not an engineered disposal facility. Given the lack of suitable hazardous waste disposal facilities in Namibia, the hazardous waste stockpiles which exist on many of the mines in the country and the fact that the mining, oil and gas, and other industrial sectors are predicted to grow significantly in the next decade, there is a need for the development of a suitable facility for the treatment and disposal of hazardous waste in Namibia.

Namwaste proposes to develop a new general and hazardous waste treatment and disposal facility in the Erongo region (to be known as the Namwaste Management Facility (NMF)), which will address the pressing shortage of solutions for hazardous waste management in the Country and contribute to the protection of the environment, whilst also creating employment opportunities and fostering economic growth.

1.2 Project Overview

The proposed site is located ~50 km north-east of Swakopmund, ~15 km north-west of Arandis, along the Trekkopje Road (Orano Uranium Mine access road), as shown Figure 1-1. The site is approximately 1 500 ha in extent, whilst the development footprint would be approximately 177 ha and occupy a portion of the site. Some of the supporting infrastructure (e.g. road, water and electricity) is located between the site and in Arandis.

The NMF will include general and hazardous waste treatment and disposal facilities as well as all required ancillary infrastructure. The NMF will be developed in phases for the disposal of general and hazardous solid and (pre-treated) liquid waste and arsenic waste. The disposal of low-level radioactive waste is not included in the current project scope

The main components of the proposed NMF are summarised in Section 2 below and detailed in the accompanying Environmental Impact Assessment Report (EIA Report), Section 5.4.

This Environmental Management Plan (EMP) for the Namwaste Management Facility has been compiled as part of the Environmental Clearance Certificate (ECC) application process and in compliance with Section 8(j) of the EIA Regulations 2012. The purpose of the EMP is to ensure that impacts associated with the project are avoided and, where they cannot be avoided, are kept to a minimum and that environmental damages, if any, are rehabilitated. The EMP, which has as its basis the technical design controls and embedded mitigation measures listed in the EIA Report (Section 5), sets environmental objectives and actions against which the project's environmental performance can be monitored and assessed.

For each of the planning and design, construction and operation phases of the Namwaste Management Facility, the EMP presents the related environmental management outcomes and actions, the roles and responsibilities and monitoring requirements.

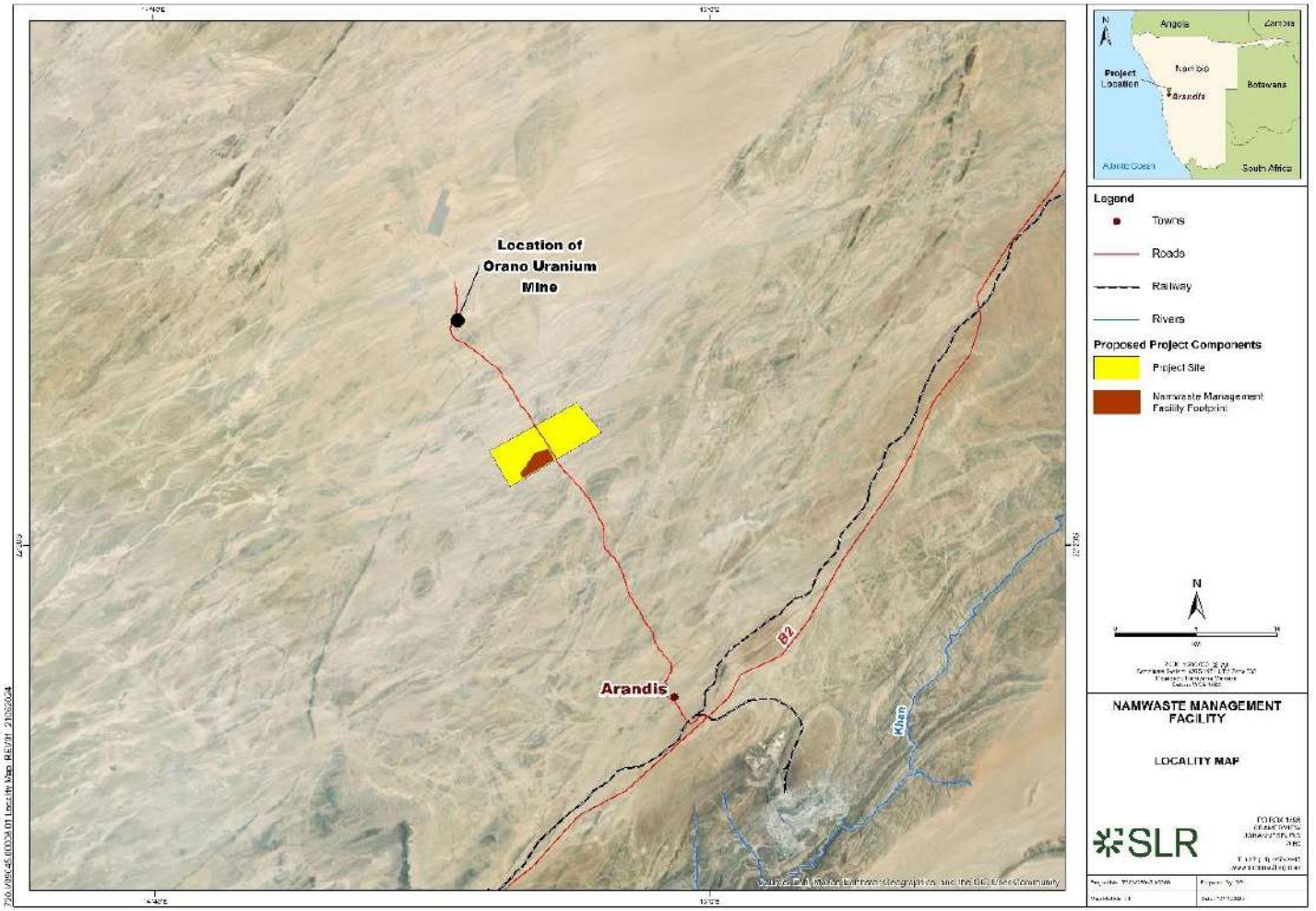


Figure 1-1: Locality of the proposed NMF Site

1.3 Details of the Applicant

The application for an ECC for the NMF has been lodged by Namwaste (Pty) Ltd, contact details are provided in Table 1-1.

Table 1-1: Applicant details

Details	
Company	Namwaste (Pty) Ltd
Relevant representatives	Thierry Provendier
Tel:	+26461 244 097
Postal address	PO Box 30735, Pionierspark, Windhoek
Email	namwaste@rent-a-drum.com.na

1.4 Legal Requirement of the Environmental Management Plan

The compilation of this EMP forms part of the requirements of the EIA Regulations 2012. *A draft version of the EMP was circulated to all stakeholders during the EIA review period*. This EMP has been submitted to the Ministry of Environment, Forestry and Tourism (MEFT) for approval and will be updated to comply with any conditions of the ECC when granted.

The EMP seeks to adopt all the mitigation measures and recommendations from the EIA Report including recommendations made by the various specialists. This EMP will be submitted for public review and comment prior to being submitted to the MEFT for approval.

In terms of the Environmental Management Act No 7 of 2007 (EMA) and Regulation 8(j) of the EIA Regulations, 2012 a draft EMP must be included as part of the EIA process.

A management plan means *"a plan that describes how activities that may have significant environmental effects on the environment are to be mitigated, controlled and monitored and must include –*

(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 rehabilitation of the environment and closure;

(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

(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."

1.5 Objectives of the Environmental Management Plan

The purpose of this EMP is to ensure that environmental impacts and risks associated with the construction and operation of the NMF are avoided or, where they cannot be avoided, are kept to a minimum through management control and mitigation, and if environmental impacts do occur that they are responded to appropriately.

The EMP sets environmental management outcomes and impact management actions for implementation, against which environmental performance at the NMF can be measured and reported.

1.6 Document Structure

This EMP has been prepared in compliance with Section 8 of the EIA Regulations 2012 and is structured in the following sections:

Chapter 1: Introduction: This section includes the project background and details of the applicant. It outlines the legal requirements and objectives of the EMP and further describes the structure of the document. Information on the EAP responsible for the compilation of the EMP is also provided.

Chapter 2: Project Description: This section provides a brief description of the proposed activities to be undertaken for the Project. A detailed project description can be found in Section 5 of the EIA Report.

Chapter 3: Administration and Regulation of Environmental Obligations: This section identifies the management structure, as well as the roles and responsibilities of the various stakeholders. The procedures for environmental management and monitoring of the construction and operation phases are also presented.

Chapter 4: Environmental Specifications: This section includes environmental specifications relating to the planning, pre-construction, site establishment, construction and operation phases for the NMF and associated infrastructure. It contains the specific actions and / or measures that must be taken in order to minimise and control the impact of project activities on the affected biophysical and socio-economic environment.

Chapter 5: Environmental Awareness and Training Plan: This section outlines environmental awareness training that should be provided to all employees during the NMF phases in order to promote the effective implementation of the EMP actions.

Chapter 6: Environmental Monitoring and Reporting: This section details the requirements of monitoring programmes and the compliance monitoring and reporting to be undertaken for the NMF.

Chapter 7: Dealing with Risks to avoid Pollution of Degradation: This section outlines ongoing monitoring and management measures as well as procedures to be undertaken in case of environmental emergencies.

1.7 Expertise of the EAP

The details of the EAPs involved in the preparation of this EMP are provided in Table 1-2 below. Curriculum Vitae are attached as **Appendix A**.

SLR has no interest in the proposed project other than fair payment for consulting services rendered as part of the environmental assessment process.

Table 1-2: Expertise of the EAP

Robyn Christians	
Qualification	BSc Environmental Restoration (2007) LLB (2016)
Professional Registration	Environmental Assessment Professionals of Namibia (EAPAN) –Practitioner
Experience in years	8 years
Experience	Robyn is a Senior Environmental Consultant with SLR and has eight years of experience as an Environmental Assessment Practitioner within the environmental consulting field in Namibia. Robyn has been involved in several EIAs for projects in various sectors. Robyn has worked on a variety of authorisation and auditing processes within various sectors. Key projects experience includes Environmental Assessments in the Oil and Gas, mining and exploration projects and renewable energy installations. She has conducted numerous public participation and stakeholder engagement activities relevant to the projects. Robyn also has experience in environmental compliance monitoring and auditing for projects.
Stephanie Strauss	
Qualification	MPhil Environmental Management (2022) PGD Environmental Management (2018) BA Honours Geography and Environmental Studies (2012)
Professional Registration	Environmental Assessment Professionals of Namibia (EAPAN) –Practitioner
Experience in years	10 years
Experience	Stephanie is an Associate Environmental Consultant with SLR and has nine years of experience as an Environmental Assessment Practitioner within the environmental consulting field in Namibia. Stephanie has been involved in several EIAs for projects in various sectors. Stephanie has worked on a variety of authorisation and auditing processes within various sectors. Key projects experience includes Environmental Assessments for urban development projects, road rehabilitation, telecommunication, waste management, and infrastructure development, mining and exploration projects. She has conducted numerous public participation and stakeholder engagement activities relevant to the projects. Stephanie also has experience in environmental compliance monitoring and auditing for projects.

2.0 Project Description

2.1 Overview

A summary of the NMF project components is provided in Table 2-1 below. A detailed project description can be found in Section 5.4 of the EIA Report.

Table 2-1: Summary of Project Components

Project Component	Details
Waste Treatment Facility and Ancillary Infrastructure	• Waste treatment facility (a series of concreted, lined, bunded, treatment bays under roof used to blend treatment additives into wastes streams that require treatment prior to disposal) with silos for storage of additives to be used in treatment (e.g., lime, cement, ferrous sulphate, ash and soil); • Laboratory to test and verify the make-up of incoming and/or treated waste as required;
Waste Disposal Facility and Ancillary Infrastructure	• Waste Disposal Facility comprising phased cells; • Warehouse with a concrete slab for off-loading of arsenic waste in bulk bags; • Landfill leachate collection and containment in suitable facilities; • Workshop; • Office block; • Parking area; • Staff dining and ablution facilities; • Yard for trucks and skips, fuel storage facilities (20 kL diesel storage tank); • Plant/vehicle washing bay and vehicle maintenance area with contaminated runoff control; and • Package sewage plant (all sewage generated on the site will be treated on site).
Stormwater Management Infrastructure	• Stormwater/ run-off management infrastructure for collection and containment of any contaminated water in suitable containment facilities; • Upstream cut-off drain to divert clean stormwater off site;
Ancillary Infrastructure	• Access road (~8 m wide) from the entrance of the industrial area of Arandis to Trekkopje Road (~5 km); • Access control facilities including perimeter fencing; • Weighbridges and control room; and • Internal roads.
Water Infrastructure	• Bulk water supply pipeline (approximately 20 km long) to convey water to the site. The pipeline will connect to the existing pipeline from the Rossing Reservoir towards Arandis Town; • On-site water storage at NMF (2 x 30 m^3 JOJO type tanks); • Boreholes for abstraction of water (50 m^3 per day); • Borehole water monitoring network;
Electrical Infrastructure	• Electrical supply via underground cable and overhead lines (33kV) and substation (500kVA) connected to nearest supply in Arandis (overhead line approximately 16 km)

2.2 Project Location

The proposed Project site is located ~50 km north-east of Swakopmund, ~15 km north-west of Arandis, along the Trekkopje Road (Orano Uranium Mine access road). The Project site is approximately 1 500 ha in extent, whilst the NMF development footprint would be approximately 177 ha and occupy a portion of the site. The proposed NMF footprint was identified through a Technical Feasibility Study (SLR, 2023) and subsequent design process. The coordinates of the proposed footprint NMF are shown in Table 2-2. The current conceptual layout of the NMF, informed by the consideration of a range of legislative, technical, financial and environmental aspects, is presented in Figure 2-1 and Figure 2-2.

Table 2-2: Coordinates of the proposed NMF footprint

Corner	Latitude	Longitude
1	22°17'48.71"S	14°53'1.28"E
2	22°16'54.46"S	14°53'42.23"E
3	22°16'47.45"S	14°54'15.04"E
4	22°17'6.38"S	14°54'27.31"E
5	22°17'52.41"S	14°53'3.63"E

Supporting infrastructure (water supply pipeline, electrical supply pipeline and access road) will be developed as part of the NMF Project. The water supply pipeline and electrical supply powerline will travel from the NMF footprint along the Trekkopje Road to Arandis. Within Arandis the infrastructure (water supply, electrical supply and access road) will be developed to the east of the town as shown in Figure 2-3.

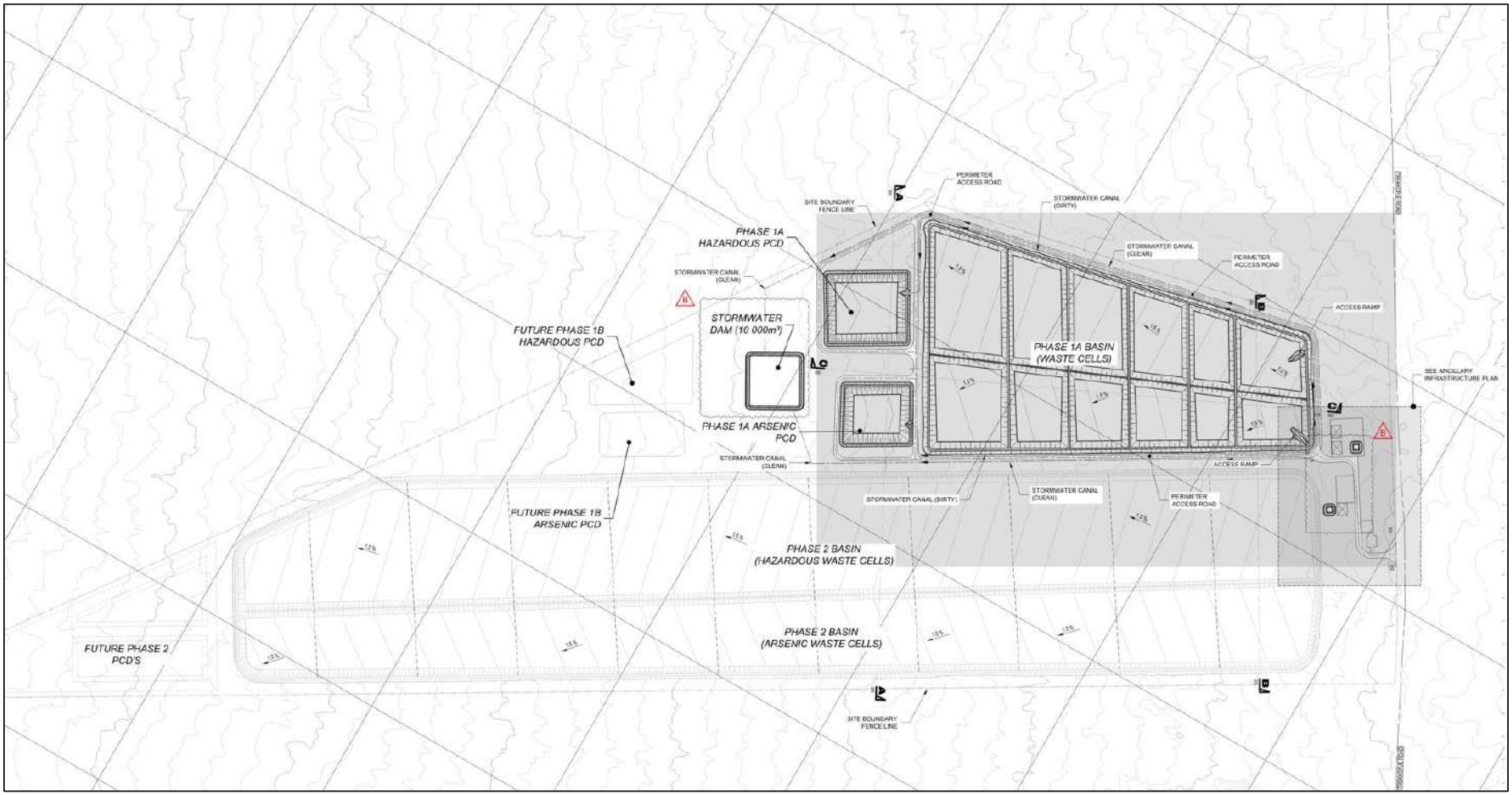


Figure 2-1: Final Phase 1 - General conceptual NMF layout

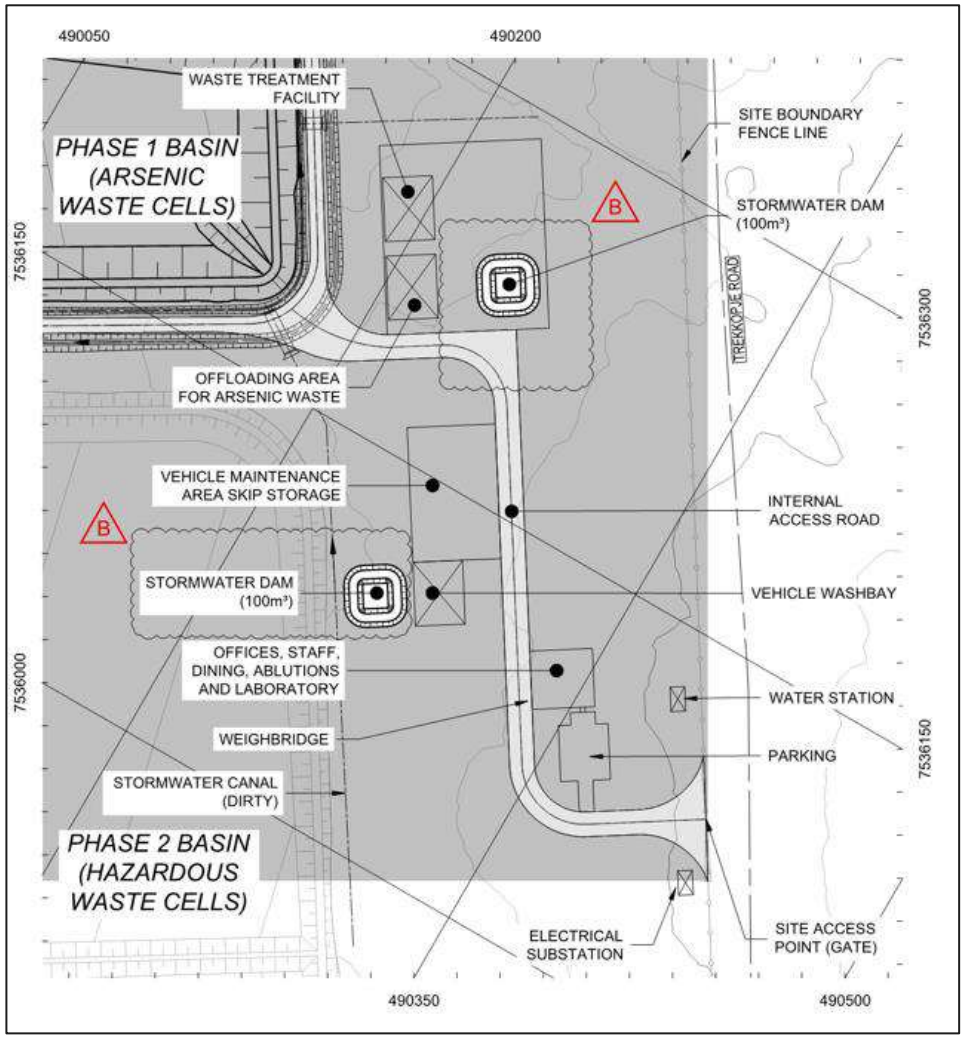


Figure 2-2: Conceptual ancillary infrastructure layout

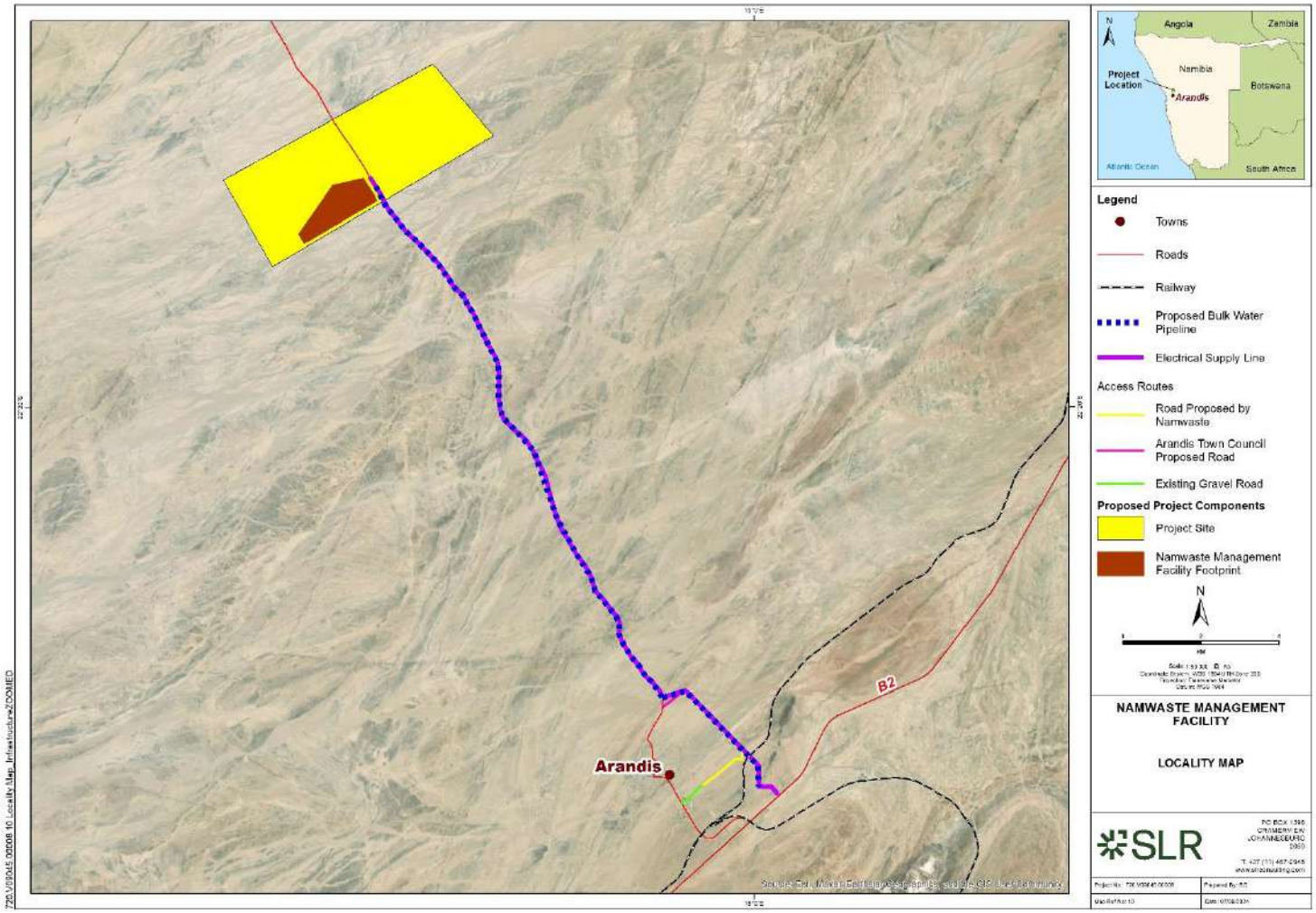


Figure 2-3: Supporting Infrastructure

2.3 Permit requirements

In addition to the ECC, the NMF may require the following permits:

2.3.1 Protected plants

Plant species protected by the Forest Act, 2001 (No.12 of 2001) and the Nature Conservation Amendment Act, 1996 (No. 5 of 1996) require a permit from the local Department of Forestry and MEFT respectively prior to the removal of such species. As per the ecological study undertaken, there are instances of protected plant species within the NMF footprint.

2.3.2 Heritage Resources

In terms of the National Heritage Act, 2004 (No. 27 of 2004) permits may be required in the event of damage to a protected heritage site occurring as an inevitable result of development. An application for consent from the National Heritage Council of Namibia is to be submitted to the Council prior to the commencement of any activities.

2.3.3 Hazardous Materials

The following permits will be required for the storage and handling of hazardous materials:

- A consumer installation certificate for diesel storage (> 600 l) in terms of the Petroleum Products and Energy Act, No 13 of 1990.
- Registration for the selling, operating and installation of infrastructure related to Group I to III hazardous substances under the Hazardous Substances Ordinance, No 14 of 1974 in relation to the Hazardous Waste Treatment and Disposal Facility.

2.3.4 Groundwater Abstraction, Stormwater Dam and Effluent Discharge

The following permits would be required in terms of the Water Resources Management Act, No 11 of 2013 if any of the following are undertaken:

- Drilling permit for any new boreholes to be drilled;
- Groundwater abstraction licence;
- Stormwater dam licence; and
- Effluent discharge permit for effluent discharged from the sewage treatment plant to the environment.

2.4 Project Phases

The following provides a basic description of what activities are expected at each phase of the project development. For a detailed description of the various activities occurring during each project phase, please see Sections 5.5 to 5.7 of the EIA Report.

2.4.1 Planning and Pre-Construction Phase

The planning and pre-construction phase entails the bulk of the design and technical work for the project in order to produce detailed designs and layouts for contractor tendering and construction. Field surveys may be required to generate information required for final designs. Appropriate design and layout of the NMF and support infrastructure to relevant standards and with consideration of local sensitivities has the greatest potential to avoid risks during later project phases. The design and planning to be undertaken during this phase must give attention to the measures and outcomes identified in Table 4-1.

2.4.2 Site Establishment and Construction Phases

Development of the facilities and infrastructure at the NMF will require activities typical of most construction, including vegetation clearance, soil stripping, bulk earth works and levelling to achieve the required elevations. Topsoil will be preserved from all stripping activities and stockpiled for use.

The common, shared infrastructure will be developed as and when required to ensure accessibility and functionality of the site. This is likely to include internal roads, electricity and water services, as well as drainage. Once the site for each facility has been prepared, the infrastructure will be constructed and or installed as per the required design specifications.

The initial construction is anticipated to be completed within 12 to 18 months. However, certain components of the NMF are phased, and the later phases will only be developed as and when required. For example, construction of the waste disposal facility will be implemented in phases with each waste cell being developed as the demand for waste disposal capacity requires. It is anticipated that a new cell will be developed every 2 years (with a construction duration of approximately 6-8 months). This will require site preparation activities such as: soil stripping, bulk earth works and levelling to the required elevations. Topsoil will be preserved from all stripping activities and stockpiled.

The construction of the access road to bypass the centre of Arandis, electrical supply line, bulk water supply pipeline, site perimeter fences, offices, staff dining and ablution facilities, waste treatment facility, first cell, pollution control dams (PCD) and stormwater dam for Phase 1A, and stormwater management infrastructure is planned to commence in the fourth quarter of 2024 and will continue into the second quarter of 2025. Cell excavation and construction will be an on-going activity throughout the lifespan of the facility. Mitigation measures and expected outcomes for this phase can be found in Table 4-2 for activities related to the NMF and Table 4-7 for activities related to the ancillary infrastructure.

2.4.3 Operations Phase

The operations phase is the most enduring phase of the project and involves the day-to-day activities anticipated in management of the NMF. This includes, but is not limited to, the transport, management, treatment and final disposal of waste, the management of containment measures, and the regular construction of new and capping of completed waste cells. The facility will be operational on weekdays (excluding public holidays), for 12 hours per day on average. Emergency spills and clean-ups (for 3rd parties) may necessitate short periods of time during which the facility will be required to operate 24 hours per day. For mitigation measures and monitoring requirements for this phase, please see Table 4-4 for activities related to the NMF and Table 4-8 for activities related to the ancillary infrastructure.

2.4.4 Decommissioning Phase

The waste disposal site at the NMF has been designed for a 62-year operational life (under Business Case 1), subject to market fluctuations. The waste treatment facility will be maintained and used for the duration of the disposal facility's life. Decommissioning of the facilities, which are not required for post-closure long-term management and monitoring of the site, will require the dismantling of the equipment, the sale and final disposal of all components, the decontamination of any contaminated areas and the rehabilitation of the site to a condition suitable for an end land use.

The life of the waste disposal site is directly related to the rate of airspace utilisation. Once the site is near to its final levels a closure plan will be developed. The end land use will be determined through a consultative process.

The closure plan will include details regarding the post-closure, long-term management and monitoring of the site.

3.0 Administration and Regulation of Environmental Obligations

3.1 Roles and Responsibilities

The implementation of this EMP requires the involvement of several role players, each fulfilling a different but vital role to ensure sound environmental management during all phases of the proposed Project. Details of the management structure for this EMP are presented below. All official communication and reporting lines including instructions, directives and information shall be channelled according to the management structure presented below. The specific EMP obligations for each of the responsible persons are detailed in Table 4-1 to Table 4-8**Error! Reference source not found.**.

3.1.1 Competent Authorities

The MEFT has overall responsibility for ensuring that the holder complies with any conditions listed in the ECC and this EMP. The MEFT will be responsible for approving any future amendments, and renewals, that may be required to the EMP.

3.1.2 Environmental Clearance Certificate Holder

The holder of the ECC, Namwaste (Pty) Ltd, is ultimately responsible for the implementation of the conditions of the ECC and all measures/actions in the EMP required to ensure that project phases are undertaken in terms of the obligations set by the regulatory framework.

Namwaste (Pty) Ltd must appoint appropriately qualified staff and consultants as 'responsible persons' to carry out the obligations set by the regulatory framework and the EMP. Where appropriate, the responsibilities arising from the EMP should be specified in contractual terms with third parties.

Namwaste (Pty) Ltd is responsible for the appointment of an Operations Manager and a Compliance Officer/Manager for all project phases, a Design Engineer for final planning, and a Construction Manager for the construction phase. Namwaste (Pty) Ltd must ensure that the appointed persons are aware of their delegated responsibilities in terms of this EMP.

Namwaste (Pty) Ltd must ensure that any person or sub-contractor acting on its behalf complies with the conditions / specifications contained in this EMP. Namwaste (Pty) Ltd should disclose any requirements of the EMP in Terms of Reference issued for tenders. Namwaste (Pty) Ltd should ensure that adherence to the ECC conditions and EMP is included as a contractual commitment for all contractors appointed to work on site. Contracts must include appropriate and effective noncompliance remedies in respect of E&S risk management. When contractors are used, the responsibility for ensuring compliance with the EMP remains with Namwaste (Pty) Ltd.

Namwaste (Pty) Ltd is responsible for the financial aspects of all environmental control measures and monitoring requirements recommended in the EMP. Namwaste (Pty) Ltd shall ensure the provision of resources for adequate facilities, equipment and suitably trained employees for implementation of the EMP. Namwaste (Pty) Ltd shall address any site problems pertaining to the environment at the request of the MEFT, Operations Manager and/or the Compliance Officer/Manager.

The ECC Holder's duties further include:

- Ensure that all relevant approvals and permits are obtained, prior to the start of construction.

- Notify the competent authority (prior to construction commencing) of the date on which construction activities will commence.
- Appoint a suitably qualified and experienced Environmental Control Officer (ECO) prior to the commencement of construction activities on site, for the duration of the construction contract. Once appointed, the name and contact details of the ECO must be submitted to the competent authority.
- Appoint a suitably qualified and experienced Independent Environmental Auditor to conduct compliance audits.
- Attach the EMP to all contract documentation with contractors, service providers, and all other relevant contracting parties.
- Ensure that the requirements set out in the EMP, and all other approvals are adhered to and implemented.

3.1.3 Design Engineer and Construction Manager

Design, construction and development of the infrastructure at the NMF must be carried out under the supervision of a suitably qualified engineer appointed by the ECC Holder and according to the design details / drawings approved by the MEFT or relevant authority.

The Design Engineer must be suitably qualified and comply with recognised civil engineering practice.

The Construction Manager shall have the following responsibilities:

- To implement relevant provisions of the EMP during the final design phase. Particular cognisance must be given to aspects that are key to achievement of operational outcomes.
- To implement all relevant provisions of the EMP during the construction phase. If the Construction Manager encounters difficulties with specifications, they must discuss alternative approaches with the design engineers and/or the Operations Manager prior to proceeding.
- To ensure that all construction staff are familiar with the ECC and EMP, including the conditions and mitigation measures contained therein.
- To compile the Method Statement (see Table 4-2) for the construction activities and or environmental aspects of the site.
- Monitoring and verifying that the environmental impacts are kept to a minimum.
- To make personnel aware of environmental issues and to ensure that they show adequate consideration of the environmental aspects of the proposed Project.
- To report any incidents of non-compliance with the ECC and/or EMP to the Compliance Officer/Manager and Operations Manager.
- To rehabilitate any sensitive environments damaged due to the construction phase.
- Failure to comply with the ECC and/or EMP may result in fines and reported non-compliance may result in the suspension of work or termination of the contract.

3.1.4 Contractor(s)

The Contractor shall have the following responsibilities:

- Implement all construction conditions specified in the ECC and the EMP, as well as other relevant permits.

- Ensure that all personnel are fully aware of the environmental requirements detailed in the EMP. The Contractor will be held liable for any penalties incurred by personnel.
- Liaise closely with the ECO and ensure that the works on site are conducted in an environmentally sensitive manner.
- Prepare the required Method Statements for approval by the ECO and Construction Manager.
- Report any incidents of non-compliance with the EMP to the ECO and Construction Manager.
- Carry out any instructions issued by the ECC Holder, at the request of the ECO, that are required to comply with this EMP.
- Make provision for site inspections by any authority.
- Rehabilitate any sensitive environments damaged due to their negligence. This shall be done in accordance with the Construction Manager's specifications and recommendations of the ECO.
- Failure to comply with the EMP may result in fines and reported non-compliance may result in the suspension of works or termination of the contract by the Construction Manager.

3.1.5 Environmental Control Officer

The ECC Holder must appoint an independent ECO who will be responsible for ensuring that the provisions of the EMP, as well as the ECC, and all relevant environmental permits, are complied with during the construction phase. The ECO will be responsible for issuing instructions to the Contractor, where environmental considerations call for action to be taken. The ECO must submit regular written reports, at least once a month, to the Compliance Officer/Manager/ECC Holder and, when required and / or requested, to the competent authority (MEFT). The ECO's duties in this regard will include, *inter alia*, the following:

- Monitor and audit: A pre-construction site visit should be undertaken prior to site clearing. Two site visits in the first month, and then monthly site visits for the balance of the construction period are recommend.
- Compile monthly audit reports for submission to the appointed Contractor, the Compliance Officer/Manager / ECC Holder, and when required to the competent authority (MEFT).
- Review and approve Method Statements.
- Advise the Contractor and/or Construction Manager on environmental issues within the defined project site.
- Assist the Contractor and/or Construction Manager in finding environmentally acceptable solutions to construction concerns that may occur.
- Recommend additional environmental protection measures if necessary.
- Monitor and verify that the EMP, ECC, and all other relevant permits and approvals are adhered to.
- Compile and administer an environmental and social monitoring system (ESMS) to ensure that the environmental management measures are implemented and are effective;
- Monitor and verify that negative environmental and social impacts are avoided, and where unavoidable, are minimised.

- Present the initial environmental awareness training course to the Contractor and their staff.
- Check the environmental complaints register, which is kept on-site and maintained by the appropriate on-site officer and ensure that the correct actions are/were taken in response to these complaints.
- Check that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance.
- Compile a photographic log of environmental management aspects on the site during the construction phase.
- Report all incidences of non-compliance to the Contractor and the Compliance Officer/ Manager/ECC Holder.
- Take immediate action on site to stop works where significant and irreparable damage is being inflicted on the environment and immediately inform the Compliance Officer/ Manager/ECC Holder of the occurrence and action taken.

Provide feedback on any environmental and social issues during the site meetings.

3.1.6 Operations Manager

The Operations Manager is responsible for the day-to-day operation and maintenance of the Namwaste NMF. The Operations Manager is ultimately responsible for compliance with the conditions set in the Environmental Clearance Certificate and implementation of on-site environmental management actions prescribed in the EMP. Any on-site decisions regarding environmental management are ultimately the responsibility of the Operations Manager.

The Operations Manager shall provide the necessary support and resources to the operational team so that they can implement the EMP requirements. The Operations Manager shall assist the site's operational team to address any Site problems pertaining to the environment. This support will be provided by the Operations Manager during the construction and operational phases of the proposed Project development.

An Operations Manager shall be required to undertake the following:

- Implement all provisions of the EMP during the operation phase. If the Operations Manager encounters difficulties with specifications, he / she must discuss alternative approaches with the Operator prior to proceeding.
- Familiarise all staff with the EMP.
- Keep negative environmental impacts to a minimum and enhance positive impacts.
- Make personnel aware of environmental issues and ensure they show adequate consideration of the environmental aspects of the project.
- Rehabilitate any sensitive environments damaged due to the Operator's negligence.
- Address any issues at the request of MEFT and / or the public.
- Implement internal operations and activities.
- Manage the various contractors e.g. landscaping, maintenance, cleaning, etc.
- Monitor and undertake all day-to-day maintenance / management activities.
- Implement the provisions of operation-related measures in accordance with the EMP.
- Undertake continual internal review of the property and operations.

- Report any incidents of non-compliance with the EMP to the Compliance Officer/ Manager/ECC Holder and / or MEFT
- Keep a register of complaints on site and record comments and issues and the actions taken in response to these complaints.

3.1.7 Compliance Officer/Manager

The Compliance Officer/Manager is appointed by the ECC Holder and will be responsible for ensuring compliance with environmental and social requirements. This includes the management and implementation of the EMP during construction and operations.

A Compliance Officer/Manager shall be required to undertake the following:

- Monitoring implementation of all provisions of the EMP by contractors, service providers, operational teams and all other relevant parties during all phases of the project.
- Familiarise all staff with the EMP.
- Keep negative environmental and social impacts to a minimum and enhance positive impacts.
- Make personnel aware of environmental issues and ensure they show adequate consideration of the environmental aspects of the project.
- Monitor rehabilitation of any sensitive environments damaged due to the Operator's negligence.
- Address any issues at the request of MEFT and / or the public.
- Undertake continual internal review of the EMP, update as required and amend ESMS as appropriate.
- Report any incidents of non-compliance with the EMP to the Operations Manager, ECC Holder and / or MEFT.
- Keep a register of environmental and social complaints on site and record comments and issues and the actions taken in response to these complaints.
- Keep a register of fauna and avifauna fatalities on site.

3.1.8 Independent Environmental Auditor

The ECC Holder must appoint an Independent Environmental Auditor who will be responsible for the following actions:

- Environmental Audit to determine compliance with the conditions of the ECC and the EMP. The audit report is to be included in the biannual monitoring reports to be submitted to the MEFT: DEA.
- Audits must be undertaken at the frequency specified in the ECC. If no frequency is specified, audits must be undertaken annually.

3.2 EMP Administration

3.2.1 Planning and Pre-Construction

Copies of this EMP shall be made available to the Design Engineer (s) and Operations Manager. All senior personnel shall familiarise themselves with the contents of this document.

The ECC and EMP, as relevant, must be included in all tender documents issued to procure construction contractors.

3.2.2 Construction

Contractor appointments must include contractual obligations to implement EMP commitments as applicable.

Copies of this EMP shall be kept at the Site office(s) and shall be made available to the Construction Manager, the Contractor(s) and each ECO. All senior personnel shall familiarise themselves with the contents of this document.

Suggestions for revisions or updates to the EMP should be directed to the Compliance Officer/ Manager and Operations Manager. Any revisions to the EMP document must be approved by MEFT before the revised EMP is implemented. When the EMP is updated, the responsible persons and relevant Contractors must be informed thereof. The Construction/Manager shall be responsible for the distribution of approved revisions to the EMP.

3.2.1 Operations

Copies of this EMP shall be kept at the Site office(s) and shall be made available to the Construction Manager, the Contractor(s), and Operations Manager. All senior personnel shall familiarise themselves with the contents of this document.

An EMP is an evergreen document, and it must be regularly reviewed and updated to ensure its relevance and effectiveness in line with environmental and waste legislation. The EMP should be reviewed regularly and updated accordingly. After the promulgation of new legislation or at the introduction of new or expanded operations at the site, the EMP should be updated and/or amended as appropriate.

Suggestions for revisions or updates to the EMP should be directed to the Compliance Officer/ Manager and Operations Manager. Any revisions to the EMP document must be approved by MEFT before the revised EMP is implemented. When the EMP is updated, the responsible persons and relevant operational teams at the Namwaste NMF must be informed thereof. The Compliance Officer/Manager and Operations Manager shall be responsible for the distribution of approved revisions to the EMP.

3.3 Stakeholder Engagement

Namwaste should continue to engage with stakeholders throughout the NMF's construction and operation. Communication with local communities and other local stakeholders will be a key part of this engagement process. A Stakeholder Engagement Plan is to be developed and incorporated into NMF's operations.

The objectives of communication and liaison with local communities are to:

- Provide residents of Arandis and other interested stakeholders, with regular information on the progress of the NMF and its implications.
- Manage any disputes between Namwaste, the contractors, and local residents.

4.0 Environmental Specifications

The following sub-sections provide the impact management outcomes (objectives) to be achieved such that the environmental impacts and risks identified during the EIA of the Namwaste Management Facility are avoided, managed or mitigated to acceptable levels. Impact management actions are specified which, when implemented, will enable the proposed environmental outcomes to be achieved.

The EMP is arranged per project component and phase, and impact management outcomes and actions are detailed for each relevant aspect. The tables detail the impact management actions, the implementation and monitoring requirements and the standard against which compliance can be assessed. The ECC holder is responsible for ensuring the implementation of these actions.

4.1 Namwaste Management Facility

This section has been divided per phase of the NMF development. It is focused solely on the waste management facility, with a separate section (see Section 4.2) detailing the objectives and actions for the construction of the support infrastructure.

4.1.1 Environmental outcomes and actions for the Planning and Pre-construction

Impact management outcome: All relevant environmental impacts and factors are considered during the planning processes. All the relevant permits and licences are in place to ensure compliance with regulatory requirements.

Table 4-1: Environmental actions and outcomes applicable to the Planning and Pre-construction phase

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Permitting	Maintain regulatory compliance to minimise project delays	• All relevant permits and licences must be obtained (or amended, where relevant) prior to initiating any construction activities and ensure the associated conditions are always implemented. • All authorisations, licences and permits must be valid and must be filed in the Environmental File and available either in hard copy or electronically on site. • All authorisations, licences and permits must be shared with planning/design teams for integration into final designs.	All authorisations, licences and permits are filed, and the Permit register remains updated. The conditions of all	Prior to construction activity commencing	Before construction commences during site walk over Quarterly audit - internal	Namwaste Construction Manager Contractor ECO

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• To allow the mitigation measures in this document to be implemented, task-specific method statements must be developed for each set of tasks. A Method Statement details how and when a process must be carried out, detailing possible risks, and the methods of control required. • The Contractor must be accountable for all actions taken in non-compliance of the approved method statements. The Contractor must keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation	authorisations, licences, permits have been implemented. Method Statements compiled, approved and complied with. Quarterly internal audit reports available for review			
2	Planning and design	Minimise risks to environmental and social aspects	All planning, design and further development of the NMF must: • be undertaken in terms of the conditions of the ECC and EMP. • include consideration for, and management of, potential environmental and social risks. All infrastructure at the NMF must be designed in terms of recognised civil engineering practices and the applicable standards. • Planning for construction works must include considerations to minimise the disturbance footprint, to preferentially place temporary facilities within the development footprint or on previously disturbed areas, to demarcate and avoid no-go or sensitive areas and to prevent single access. Traffic Planning: • Engagement with the road planning authority to ensure project inclusion in planned B2 upgrades. Terrestrial Ecology	Design sign-off Proof of consultation with authority	Planning	Once	Namwaste Design Engineer

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• A suitably qualified botanist should be commissioned to assess threatened species presence with development footprints, collect seeds/cuttings, and relocate plants where possible. • The botanist should share their findings with the National Botanical Research Institute (NBRI) if appropriate. • An invertebrate specialist be engaged prior to construction to supply a baseline description, highlighting taxa that are of conservation concern and providing a description of aspects on site that are important to the continued survival of taxa or populations.	Appointment of the required specialist.			
3	Environmental Awareness Training	Ensure all staff is aware of the EMP, to ensure compliance.	• Environmental awareness training workshops. • All staff must receive environmental awareness training prior to commencement of the activities.	Attendance register	Pre-construction	Monthly and when required	ECO Contractor
4	Surface water Groundwater Leachate quality and management	To minimise impacts on surface water and groundwater quality and availability such that risks to the ecosystem and downstream users are prevented.	• The containment barriers of all waste cells, PCD and storm water dams must be designed by suitably qualified engineers to have equivalent performance to the containment barriers set out in terms of Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013) (or its successor), as relevant, and be approved as per the requirements of the ECC. • Provision must be made for the construction of all waste cells, PCDs and storm water dams to be carried out under the supervision of a suitably qualified engineer in terms of a Construction Quality Assurance plan. • Develop and maintain a network of boreholes and locations that enables monitoring of ground and surface water conditions upstream and downstream of the NMF. • Stormwater management infrastructure must be developed and maintained to divert clean water away from the facility and contain all dirty water arising on the site, with adequate	Final Design Drawings and Report Approval by qualified engineers Final Design Drawings and Report Approval	Planning	Prior to construction of each cell, PCD and stormwater dam At the frequency indicated in	Design Engineer & Compliance Officer/ Manager and Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			freeboard to prevent overtopping in the case of a 1:50 year flood event. • Storm water management infrastructure should be designed to attenuate and divert water away from the NMF infrastructure to prevent flooding of the infrastructure.	Water Monitoring Program Final Design Drawings and Report Approval Stormwater Management Plan		the Monitoring Plan Prior to construction of each cell, PCD and stormwater dam As specified in the SWMP	Compliance Officer/Manager & Operations Manager Engineer & Compliance Officer/ Manager and Operations Manager
5	Appointment of contractors	Minimise risks to environmental and social aspects by ensuring clear roles and responsibilities.	• Namwaste must brief contractors on the conditions of the ECC and EMP. • Namwaste must include the ECC and EMP in tender documentation so that the tendering parties are fully informed of the E&S risk management requirements. • Tender documents must require tenderers to specify their resources and provisions for E&S risk management in their submission. • When awarding construction or maintenance contracts, Namwaste must be satisfied that any selected Contractor is a legitimate and reliable enterprise, which has the knowledge and skills to perform their project tasks in accordance with their contractual commitments. Such knowledge and skills must extend to the obligations in the ECC and EMP. • Compliance with the ECC and EMP must be included as a contractual commitment in construction or maintenance contracts.	Tender documents Contract between Namwaste and Contractors	Planning and Construction periods during Operations	Once for each contractor appointment	Namwaste EPC Contractors

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
6	Stakeholder relationships	Maintain industry relations	• Communicate with the Walvis Bay Municipality regarding the development of the Namwaste Management Facility.	Evidence of communication	Planning Phase	Once	ECC holder
6	Surface water	Prevention of flooding	• Investigate and implement stormwater infrastructure that can attenuate runoff to avoid drastic flow increases in the receiving drainage lines. • Containment and conveyance stormwater infrastructure should be designed in a manner that prevents frequent spills and minimizes flooding. • Rainwater harvesting is also recommended to manage water emanating from impervious areas and minimise flooding. • The principles of the conceptual SWMP should be implemented during the detailed design phase	On site inspection	During operations	Continuous	–Operations Manager

4.1.2 Environmental outcomes and actions for the Site Establishment Phase

Impact management outcome: Impacts on the environment are minimised during site establishment and the construction and development footprint is kept to a demarcated area.

Table 4-2: Environmental actions and outcomes applicable to site establishment.

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Site Establishment	Defined footprint and boundaries to minimise project impact	A **Site Establishment Method Statement** must be provided by the Contractor prior to any on site activity. The Method Statement to include the layout of the construction camp/laydown area in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to: • Site offices, • Overnight vehicle parking areas, • Stores, • The workshop, • Stockpile and lay down areas, • Hazardous materials storage areas (including fuels), • The batching plant (if one is located at the construction camp), • Designated access routes, • Equipment cleaning areas • Cooking and ablution facilities, • Waste and wastewater management.	Method statement developed. Layout of the construction camp with designated areas provided.	Site Establishment Phase	Once, prior to each construction project commencing	Contractor and ECC Holder ECO - monitoring
2	Site Establishment	Project footprint avoids sensitive areas	• Location of construction camps/laydown areas must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through.	Approved layout plan implemented	Site Establishment Phase	Once, prior to each construction project commencing	ECC Holder ECO - Monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
3	Site Establishment	Protection of sensitive area	• Place sites within previously disturbed areas or areas to be disturbed in future where possible. • Demarcate the development footprint, working area and no-go boundaries on figures. • Avoid and enforce the “no-go” areas outside the defined project area.	Layout and sensitivity map indicating avoidance of sensitive areas. The camp must be fenced. Photographic record	Site Establishment Phase	Once, prior to each construction project commencing	ECC Holder Contractor ECO - monitoring
4	Surface water quality Ground-water quality	To minimise / prevent impacts on water quality and availability such that risks to the ecosystem and downstream users are prevented.	**General Management** • The footprint of disturbed areas must be minimised. • “No-go” zones must be delineated for construction plant and personnel. • Ensure the siting of facilities where hazardous goods must be stored, handled or managed, > 50 m away from drainage lines or areas with dykes or very shallow aquifer (<5mbgl), unless appropriate stormwater management infrastructure has been developed. A waste management plan (WMP) must be developed in-house by Namwaste for the construction phase.	Site inspections and audits No erosion Construction WMP Water quality monitoring reports	Planning and design phase	Once, prior to each construction project commencing	Construction Engineer & Operations Manager
5	Cultural heritage	To mitigate impacts on cultural and heritage resources	• Should any graves be discovered, a grave relocation must be done in line with legislation, taking the preferences of the affected families into consideration. • If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented. Discoveries to be reported to National Heritage Council of Namibia (52, Robert Mugabe Avenue, Windhoek, Namibia, Tel: 061 244 375).	Chance Find Protocol	Site Establishment Phase	Daily during construction	Construction Engineer & Operations Manager (supported by Archaeologist and/or Palaeontologist)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
6	Social	Local content Ensure adequate housing for workers	• Maximise use of local skills and resources through preferential employment of locals where practicable. • Determine the local housing capacity of Arandis and the likely impact of the various options for workers' accommodation. • Investigate potential partnerships with NGOs, donors, or other community organisation who would be able to assist in developing options for workers' accommodation. • Minimum Standards for housing should be complied with. • The use of existing accommodation for contractor staff, where possible, is encouraged. • Work with relevant stakeholders to identify local businesses and contractors providing the required services. • Source as many goods and services as possible from the local and regional economy (e.g. use local contractors and accommodation and equipment suppliers as far as possible and purchase perishable goods locally). • Provide suitable training to service providers, where possible and practicable. • Develop and implement a fair and transparent procurement policy	Worker's accommodation identified and complies with minimum requirements of the relevant Namibian legislation. Contractor staff are utilising existing accommodation, where possible	Site Establishment Phase	Once prior to each construction project commencing	Contractor ECO.
7	Environmental Awareness Training	Ensure all staff is aware of the EMP, to ensure compliance.	• Environmental awareness training must include as a minimum the following: o Description of significant environmental impacts, actual or potential, related to their work activities; o Mitigation measures to be implemented when carrying out specific activities; o Emergency preparedness and response procedures; o Emergency procedures;	Training Records to include: A record of all environmental awareness training courses undertaken as part of the EMP must be available.	Site Establishment Phase	Monthly and as when required	Namwaste Contractor ECO - monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			○ Procedures to be followed when working near or within sensitive areas; ○ Wastewater management procedures; ○ Water usage and conservation; ○ Solid waste management procedures; ○ Sanitation procedures; ○ Fire prevention; and ○ Disease prevention. • Environmental training should be undertaken in English with reasonable accommodations for a secondary language (most common amongst the workforce). • The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course. • Refresher environmental awareness training is available as and when required. • All staff are aware of the conditions and controls linked to the ECC and within the EMP and made aware of their individual roles and responsibilities in achieving compliance with the ECC and EMP. • The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: ○ Safety notifications; and ○ No littering.	A staff attendance register of all staff who have received environmental awareness training must be available.			
8	Vehicle Tracks	To minimise physical harm to humans	• Maximise use of existing roads to minimise disturbance caused by the development of new roads. Implement approved layout and specify existing access routes to be used. • Transport planning and logistics to avoid platooning. Delivery of materials to be limited to off peak times.	Proof of Deliveries – for materials	Site Establishment Phase	Continuous	Contractor ECO - Monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Adherence to gravel road speed limits. Erection of speed limit signs at regular intervals along the route.	Visible inspection of route to ensure integrity of signs Proof of consultation with authorities			
9	Environmental disturbance	Minimise project impact beyond project boundary	• Identify access restricted areas, that have been informed by the environmental assessment, site walk through, and any additional areas identified during development and construction. • Access to the site must be limited and all construction staff and machinery must remain within the demarcated construction area. • Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate. • Unauthorised access and development related activity inside access restricted areas is prohibited.	Photographic record Access control register	Site Establishment Phase	Continuous	Namwaste Contractor ECO - Monitoring

4.1.3 Environmental outcomes and actions for the Construction Phase

Impact management outcome: Impacts on the environment during construction of the site facilities are minimised and the project footprint is kept to a minimum and within the approved area.

Table 4-3: Environmental actions and outcomes applicable to construction.

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Terrestrial Ecology	No loss of habitat beyond project site	• Do not destroy the trees or shrubs in the drainage on the northern border of the NMF. • Demarcate or fence any sensitive areas that should be avoided, e.g. nests, trees, shrubs, burrows as identified by the specialist. • Keep the overall development footprint as small as possible. • Limit working areas to within the development footprint • No collection of plants or wood for any reason whatsoever. • No fires.	Visual monitoring checklists Photographic record	Duration of construction	Bi-weekly	Construction Engineer & Operations Manager ECO (monitoring)
2	Air quality Land use	To minimise / manage air pollution nuisance (dust and odour), noise and prevent health impacts to public receptors.	• Apply separation distances or buffers to ensure that incompatible land uses are located in a way that minimises impacts caused by noise, odour, nuisance dust, polluting air emissions and/or water polluting activities. • No residential developments should be allowed to develop within the health buffer zone. • Namwaste must interrogate all land use planning applications within the buffer zone and challenge those that propose land uses which are incompatible with the buffer zone requirements.	Maintain a buffer zone Maintain a complaint's register for external grievances	Duration of construction phase	Ongoing	Construction Engineer & Operations Manager ECO (monitoring)
3	Surface water quality	To minimise / prevent impacts on surface water quality and availability	**General Management** • Storm water management infrastructure must be constructed first, which must include temporary diversion of upstream run-off from the construction and laydown areas.	Site inspections and audits No erosion	Duration of construction phase	Continuous during construction	Construction Engineer & Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
	Ground-water quality	such that risks to the ecosystem and downstream users are prevented.	• Impacted and clean surface water management measures, such as storm water canals, sediment traps and sumps are to be constructed first to ensure that runoff and dirty water spills are contained. • Temporary storm water collection sumps must be provided to allow particles suspended in the storm water to settle before releasing the storm water to the catchment. • Emergency repairs to construction vehicles must take place only in dedicated areas that are equipped with drip trays. • No routine repairs or servicing of construction vehicles must be permitted on site. • Use bunded containment and settlement facilities for hazardous materials, such as fuel and oil. Storage areas to be located greater than 50m from drainage lines. • Spill kits to be kept on site, and used to clean up hydrocarbon spills in the event that they should occur. Establish and implement a robust clean-up plan that must be used to handle spills during construction. • Erosion protection measures must be implemented at steep areas. • Sewage management must be implemented during the construction phase, which must likely involve the use of chemical toilets • Water quality monitoring (surface and groundwater) must be undertaken downstream of the construction areas, before and during construction where practical, in order to detect any increase in suspended solids or turbidity. • If erosion is evident, or the water quality monitoring indicates an increase in suspended solids, water management around the construction areas must be reviewed and upgraded. • Water used for dust suppression and during construction activities to be monitored.	Construction WMP Water quality monitoring as per Water Monitoring Plan			ECO - Monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Dust suppression must be controlled to avoid over application and runoff of excess water. **Site development** • Minimise the disturbance of vegetation and soils as much as possible by restricting construction activities within demarcated areas. • Clear areas only as and when needed for construction-related purposes. • Dirty construction activities requiring containment of storm water (e.g. servicing areas and workshops, fuel storage areas, waste storage areas) must be minimised and surrounded by bunds. • Upslope runoff must be diverted around construction activities.				
4	Stormwater and pollution management	To minimise impacts on surface water and groundwater quality and availability such that risks to the ecosystem and downstream users are prevented.	• The construction of each waste cell, PCD, or stormwater dam must be carried out under the supervision of a registered professional engineer in terms of a Construction Quality Assurance plan. • Waste cell, PCD, or stormwater dams must only be commissioned once they have been certified as completed by the RE. • Stormwater management infrastructure must be developed and maintained to divert clean water away from the facility and contain all dirty water arising on the site, with adequate freeboard to prevent overtopping in the case of a 1:50 year flood event. • Ensure that PCD, stormwater dams and sewerage system are inaccessible to reptiles and birds.	CQA Inspections Visual record Stormwater Management Plan	Duration of construction of the containment barrier system	Continuous	Construction Engineer & Operations Manager
5	Visual Soils	To minimise / avoid visual impacts / aesthetics to	• Restrict construction activities to daylight hours to negate or reduce the visual impacts associated with lighting. (Exceptions to be discussed and approved by ECO)	Visual monitoring checklists	Duration of construction	Bi-weekly	Construction Engineer & Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons

		public receptors.	• Removal of existing vegetation and topsoil should be minimised.
			• Earthworks should be undertaken in a phased manner to restrict vegetation clearance to the development footprint and its surrounds. In all other areas, natural vegetation, should be retained, especially along the periphery of the site.
			• Cleared areas/cut and fill slopes must be rehabilitated as soon as possible.
			• Paint all structures with colours that reflect and compliment the colours of the surrounding landscape.
			• Management of topsoil:
			  • All top soil that is removed must be stockpiled for later use.
			  • Position storage / stockpile areas in unobtrusive places.
			  • Demarcate topsoil stockpile areas and prevent stockpile erosion and contamination.
			  • Strip and stockpile topsoil and subsoil separately.
			  • Handle soils with care from the construction phase through to the decommissioning phase.
			  • The stockpiles themselves must be placed in locations of low land capability.
			  • The topsoil stockpiles must be placed in their final location and must not be moved until the time comes to use the soil for rehabilitation. The topsoil should not be higher than 4m and dumped off the back of the dump truck into its final location.
			  • No shaping of the topsoil stockpile is allowed, and no vehicles are allowed to drive on top of the stockpiles at any time.
			• Maintain housekeeping by regularly removing rubble and waste from the site.
				Monitoring of disturbed surfaces, topsoil stockpiles and rehabilitated areas			ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Limit the number of vehicles and trucks travelling to and from site. • Use dust suppression techniques on all access roads, cleared areas and on top-soil stockpiles.				
6	Traffic	To minimise physical harm to humans	• Provision of road markings for the full section of the NMF access road. • Make use of existing roads or upgrade tracks before new roads are constructed on the project site. The number and width of internal access routes must be kept to a minimum. • Communicate with relevant stakeholders regarding anticipated traffic volumes as and when required. • Communicate with the relevant local stakeholders regarding measures being put in place to monitor and improve road safety as and when required.	Site inspections and audits	During transportation and movement of heavy vehicles delivering materials to site	Duration of construction	Construction Engineer & Operations Manager

7	Environmental Awareness Training	Ensure all contractors is aware of the EMP, to ensure compliance.	• Environmental awareness training must include as a minimum the following:
			  • Description of significant environmental impacts, actual or potential, related to their work activities;
			  • Mitigation measures to be implemented when carrying out specific activities;
			  • Emergency preparedness and response procedures;
			  • Emergency procedures;
			  • Procedures to be followed when working near or within sensitive areas;
			  • Wastewater management procedures;
			  • Water usage and conservation;
			  • Solid waste management procedures;
			  • Sanitation procedures;
			  • Fire prevention; and
			  • Disease prevention.
				Training Records to include:
				A record of all environmental awareness training courses undertaken as part of the EMP must be available.
				A staff attendance register of all staff who have received environmental awareness
					Prior to construction	Monthly and as when required	Namwaste
							Contractor
							ECO - monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons

			• Environmental training should be undertaken in English with reasonable accommodations for a secondary language (most common amongst the workforce).
			• The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course.
			• Refresher environmental awareness training is available as and when required.
			• All staff are aware of the conditions and controls linked to the ECC and within the EMP and made aware of their individual roles and responsibilities in achieving compliance with the ECC and EMP.
			• The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:
			  ○ Safety notifications;
			  ○ Relevant E&S topics (e.g.);
			  ▪ No access to no-go areas;
			  ▪ No poaching, wood collection or disturbance to wildlife;
			  ▪ No offroad driving;
			  ▪ Traffic safety; and
			  ▪ No littering.
				training must be available.			

8	Access restriction and Control	Minimise project impact beyond project boundary	• Identify access restricted areas, that have been informed by the environmental assessment, site walk through, and any additional areas identified during development and construction. • Access to the site must be limited and all construction staff and machinery must remain within the demarcated construction area.	Photographic record Access control register	Prior to construction	Continuous	Namwaste Contractor ECO - Monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate. • Unauthorised access and development related activity inside access restricted areas is prohibited. • Regularly inspect the project area and surrounding area for signs of illegal activity.				
9	Soils Drainage	Minimise erosion and contamination	• Implement embedded controls such as geotextiles and gabion baskets to control soil erosion on-site where required. • Introduce and enforce speed limits on all vehicles; maintain speed limits on site to minimise wind erosions; • Educate and sensitise personnel to avoid driving on bare rocky hillside and other areas prone to soil erosion. • Spills of fuel and lubricants from vehicles must be contained and cleaned up immediately. • The use of biodegradable fluids as an alternative to mineral oil (e.g. lubricants or Hydraulic oils) must be considered where feasible. • Avoid disposal of construction waste on undesignated areas (outside the site proposed for the waste management facility) which are not contained, such as the potential contaminating fluids and other waste; and clean up areas of spillage of potentially contaminating fluids and solidsPhasing/scheduling of earthworks must be implemented to minimise the footprint that is at risk of erosion at any given time, or schedule works according to the season. • Where feasible, schedule construction to take place in months or seasons where there is less rainfall.	Monitoring of disturbed surfaces, topsoil stockpiles, rehabilitated areas, the functioning of drains and the maintenance of roads.	During construction	Continuous	Namwaste Contractor ECO - Monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Storage of potential contaminants in appropriate containers, with secondary containment and/or within bunded areas. Storage areas to be located greater than 50m from drainage lines. • In case of an occurrence of a discharge incident that could result in the pollution of surface water resources, an emergency response plan should be implemented. • Maintenance of vehicles/plant to be done in a bunded concrete hardstand area or off-site. • A spill kit must be kept on-site and be easily accessible. • Ensure maintenance of the surface water management infrastructure to prevent erosion.				
10	Social	Prevent spread of disease	• Include health related training in all induction training for project employees. • Ensure there is easy access to HIV and AIDS related information and condoms for all workers involved with the proposed programme. • Encourage voluntary HIV and AIDS counselling and testing.	Successful undertaking of project induction Number of staff undertaking voluntary HIV and AIDS counselling and testing	During construction	Continuous	Namwaste Contractor ECO - Monitoring
11	Security	Ensure security on site	• Liaise with relevant stakeholders regarding where construction workers must be accommodated before and during construction to inform them of construction status and discuss safety management measures to reduce security risks. • Maintain a visible security presence on site. • Implement a grievance mechanism during the construction phase. • Control site access.	Security incidents recorded	During construction	Continuous	Namwaste Contractor ECO - Monitoring

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Declare areas outside of the construction site as no-go areas for construction activities. • Regularly inspect the project area and surrounding area for signs of illegal activity				
12	Social	Minimise tension and conflict	• Implement a grievance mechanism during the construction phase. • Undertake engagement with relevant stakeholders within Arandis as and when necessary.	Proof of implementation of a grievance mechanism. Number of complaints in relation to tension and conflict.	During construction	Continuous	Namwaste Contractor ECO - Monitoring

13	Heritage	No damage/destruction of heritage resources	• Demarcated and treat the following sites as no-go zones:
			  ○ Potential hunting blind 22°17'8.628" S and 14° 54' 24.852" E;
			  ○ Potential seed digging 22°24'55.398" S and 14°59'58.902 E; and
			  ○ Potential grave sites 22°23'36.36" S and 14°58'20.00" E, as well as 22°23'36.46 S and 14°58'20.03 E.
			• Implement buffer zones of approximately 10 to 50 m around the above-mentioned sites and erect warning signs at the start of the buffer zones.
			• Integrate the site's locality into the general sensitivities map of the Project.
			• Should any potential heritage resources be discovered the Chance Find Procedure as outlined in the EMP (Appendix E) should be implemented.
				Demarcation of no-go areas and buffer zones
				Number of heritage resources encountered
					During construction	Continuous	Namwaste
							Contractor
							ECO - Monitoring

4.1.4 Environmental outcomes and actions for the Operation Phase

Impact management outcome: Impacts on the environment during operation of the site facilities are minimised and the project footprint is kept to a minimum and within the approved area.

Table 4-4: Environmental actions and outcomes applicable to operations of the NMF.

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
1	Air quality (odour and dust nuisance) Visual	To minimise air quality pollution and odour.	• Operating facilities and machinery to be maintained and kept in good condition to limit air quality and visual impacts. • Litter must be collected around the NMF, fences and surrounding areas when required and returned to the landfill. Odour • Adequate measures must be taken when accepting, treating and disposing waste loads, as well as operating the Pollution Control Dams, to minimise the release of odour or hazardous emissions. • Burning of waste must not be permitted. • Particularly odorous waste streams should be pre-scheduled for priority treatment, disposal and covering. • Leachate and contaminated runoff must be managed in accordance with best practice to minimise emissions. • Should there be odour complaints from receptors (e.g. in Arandis), the viability of covering the leachate dams (using hexacovers, for example) should be assessed.	Waste management procedures / protocols Monitoring of Air Quality control measures	During operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person

			• Develop an odour management plan (OMP) including elements to prevent or reduce odour nuisance beyond the operational boundary. The OMP should include:
			  ○ Protocol containing actions and timelines.
			  ○ Protocol for conducting odour monitoring (e.g. fenceline passive monitoring).
			  ○ Protocol for response to identified odour incidents (including the management of complaints, identification of operations at the time, weather conditions, procedures for communicating with the complainant and the authority, etc.).
			• Open communication and warning communities when to expect potential odour events (e.g. during upset conditions) must be implemented when required to generate increased trust and facilitate communication between parties.
			<u>Dust</u>
			• Waste loads with the potential to generate windblown litter must be fully covered during on-site transport.
			• Hard surfaces must be swept to limit the entrainment of dust.
			• When unloading, treating or disposing of dry wastes with the potential to generate dust the following can be applied:
			  ○ Internal wind screens,
			  ○ Wetting of wastes (if compatible / possible),
			  ○ The working face area must be wetted.
			• The outer berms and non-operational areas of the Site must be vegetated (where practicably possible).
			• Install porous windbreaks/ fencing to act as windbreaks around the facility or at a minimum alongside areas of				

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			high erosion potential (e.g. cell excavations and active cells where cover material is being spread and compacted frequently). • Initiate or increase the frequency (as applicable) of water sprays and consider the addition of surfactants/ chemical suppressants for areas / activities of concern (i.e. active cells), along unpaved roads and exposed surfaces. Additional spraying may be required during high wind speed (> 5.4 m/s) or gusty conditions. • Consider windbreaks, contouring and material covers or enclosures for soil stockpiles. • Minimum practical drop heights must be adhered to when offloading waste and cover materials. • The handling of friable materials must be halted during high wind speed (>5.4 m/s) or gusty conditions or alternatively wetted prior to disposal/application. • Reduce the size of active cells as far as practicable. • Cover material must be applied daily. • Where applicable, initiate rehabilitation (e.g. revegetation with appropriate species, even if sparse, in line with the surrounding landscape, or coarse material covers) to reduce entrainment as far as feasible on the surface of inactive cells. • As a minimum, Namwaste must wet or apply chemical binding agents to the unpaved sections of the bypass and Trekkopje Road.				
2	Air quality Human health Surface water quality	To minimise air pollution nuisance and odour, prevent health impacts to public receptors and	• Waste containers (e.g. IBCs) may only be utilised if they are of sound structure and integrity and suitable for the waste type to be contained. • Maintain appropriate operational controls (e.g. ensure active cell faces are covered daily with appropriate materials, manage pH levels during treatment, where relevant, to prevent excess generation of H2S, etc).	Site audits and checklists	During operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
		minimise surface water pollution.	• Investigate the need/practicality of installing an LFG collection and control system for the destruction of carcinogenic and odorous gases once sufficient data is available. • The cleaning and maintenance of waste containers must be done in designated areas where there are facilities to contain potential spillages and contaminated runoff water.				
3	Human health and safety	To ensure public safety and security and prevent injury or unauthorised site access.	**Site Security and Access Control** The licensed perimeter of the Site must be fenced to prevent unauthorised access. • Security staff must be trained in the provision of appropriate security services. • Appropriate signage must be erected at the Site's entrances to indicate the responsible person, contact details and risks involved with the site. • All visitors must be directed to the Site office. • Namwaste personnel must be provided with appropriate information, training, supervision (where relevant) and personal protective equipment for the areas of the Site which they may access. • Contractors and visitors must be provided with appropriate and relevant information and supervision and must be advised of personal protective equipment requirements for the areas of the Site which they may access. No entry to the operational areas may be permitted in the absence of the required PPE. • Authorised personnel must only be permitted access to areas of the Site for which they are appropriately informed, trained, supervised (where relevant) and equipped. • Namwaste must develop and apply Site Rules for Employees, Visitors, Truck Drivers and Contractors.	Security register and site security and access requirements	During arrival onsite	Continuous	Operations Manager or Security Contractor if applicable

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			• Security lighting must be directional and aimed to target specific areas. • Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the site. • Minimize the number of light fixtures to the bare minimum, including security lighting. • Avoid high pole top security lighting along the periphery of the site and use only lights activated on illegal entry to the site				
4	Off-road driving	To prevent environmental damage by off road driving	• Prevent prohibited driving/access by installing cameras and GPS trackers in all vehicles and have them monitored in real time by the security team.	Cameras should be installed in all vehicles belonging to the proponent. New tracks observed must be reported to the Compliance Manager to rehabilitate the site.	During operations	Continuous	Operations Manager or Security Contractor if applicable
5	Traffic Human health and safety	To minimise traffic volumes, ensure public safety and health, and minimise surface water pollution	**Public Roads & Arrival at the Site** • All waste delivery vehicles must be instructed to only use the nominated bypass route, unless the use of this route is not possible due to an emergency situation. Any transit through the centre of Arandis should result in sanctions to the driver and controlling company. • Namwaste vehicles, and third-party companies accessing the Site must comply with Road Traffic and Transport Act 22 of 1999 and related Regulations.	NMF Operations Manual	Duration of vehicle movements	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			• Waste delivery driver/contractors must be instructed to cover all waste loads. • Paved portions of entrance/exit road to the Site must be swept regularly. • Vehicles carrying waste to the site must be directed to the appropriate facility by instructions as per the waste acceptance procedure. • A Technical Services Acceptance Sheet (TSAS) must be prepared for each waste load before it can be booked for treatment or disposal at the facility which must describe the processes to be followed on site and must contain an overview of major hazards and precautions to be taken. • All waste loads must be inspected and/or subjected to verification analysis for conformance to the TSAS before it enters the facility. • Once a load has been cleared for acceptance, the delivery vehicle must be directed to the appropriate facility on the Site. • Communicate with relevant stakeholders regarding anticipated traffic volumes as and when required. • Communicate with the relevant local stakeholders regarding measures being put in place to monitor and improve road safety as and when required. • Dust suppression measures (e.g. road wetting or application of suitable binding agents) must be implemented on Trekkopje Road to minimise dust. **On-site / Internal Roads** • Appropriate warning and hazard signs must be erected in high-risk areas within the Site. • Internal roads must be developed and maintained to allow vehicular access across the Site. Such roads shall				

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			accommodate two-way traffic where necessary and be suitable for all weather access. • Surface water run-off from internal roads that give access to the waste disposal cells or on which waste loads are transported must be contained. • Speed limits of 30km/h or less must be enforced on internal roads. • Dust control measures must be applied to internal roads and during waste load transport to prevent wind-blown dust from resulting in nuisance conditions beyond the site boundary. • Vehicles must not be permitted to drive off formal roads, unless approved by the Operations Manager for a specific purpose. • Keep all roads well maintained and avoid steep inclines.				
6	Human health and safety Surface water quality Ground-water quality	To ensure public safety and health and minimise surface water pollution impacts through appropriate vehicle management and maintenance.	**Equipment and Vehicles** • Namwaste vehicles and plant must be serviced and maintained in proper working order and/or roadworthy condition per an equipment and vehicle maintenance plan. • Vehicle and plant servicing must only be undertaken in workshops, or areas with an impermeable base and facilities to contain potential spillages and contaminated water. • Emergency repairs to vehicles and plant on Site, outside of areas with an impermeable base, must make use of necessary precautions to prevent spillages of hydrocarbons. • Refuelling of vehicles and equipment on Site, outside of areas with an impermeable base, must make use of necessary precautions to prevent spillages of hydrocarbons. • If any spills or leaks from vehicles and/or machinery occur, they must be cleaned up immediately to avoid soil	Vehicle & equipment maintenance and servicing, and vehicle road worthiness checks.	Duration of equipment operations and vehicle movements	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			contamination. Appropriate spill kits must be available to contain and clean up any hydrocarbon spillages.				
7	Air quality Human health Ground-water quality	To prevent health impacts to public receptors, minimise air pollution, and minimise groundwater pollution.	**Waste Acceptance** • Only permissible/authorised waste may be accepted. • All waste loads arriving at the Site must follow the Namwaste Waste Acceptance Procedure. • A Technical Services Acceptance Sheet (TSAS) which must be prepared for each waste load prior to the load arriving at the facility, specifying processes to be followed on site, must be consulted for each load upon its arrival at the facility. • All waste loads must be inspected and/or subjected to verification analysis for conformance to the TSAS before it enters the facility. • Once a load has been cleared for acceptance, the delivery vehicle must be directed to the appropriate facility on the Site. • Should a waste load not meet the Site's acceptance criteria, Namwaste must contact the waste manager/waste generator to verify and, where possible, rectify the waste composition and related information. If the waste load does not meet the Site's acceptance criteria it must be rejected and returned to the waste manager/waste generator. • Waste loads awaiting acceptance, treatment or disposal must be handled and managed in such a way as to minimise the generation of odour, harmful emissions or spills.	Weighbridge tickets, TSAS and Waste reporting to Namwaste	During waste acceptance	On-going	Operations Manager
8	Human health	To prevent health impacts to public receptors and minimise surface water pollution.	**Dangerous Goods Handling and Storage** • All hydrocarbon and chemical (i.e., chemicals, paints, poisons, etc.) storage must be confined to demarcated, adequately bunded areas within the Site. • Handling and usage of dangerous goods, as defined in the South African National Standard (SANS 10234) or Namibian	MSDS availability	Operational phase	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			equivalent must be done with due consideration of the health, safety and environmental risk. • The relevant MSDSs for all dangerous goods must be available. • Surface water run-off from dangerous goods storage areas must be contained. • Chemicals must be stored in accordance with generally accepted practices to ensure their efficacy and safety. • Incompatible chemicals must be stored separately.				
9	Health of Public & Staff	To prevent health impacts to public receptors and staff	**Waste Treatment** • Waste requiring treatment must not be disposed until the treatment has been applied. • All waste must be treated in line with the instructions on the TSAS developed for each waste stream. • Waste may only be treated at the Site within the lined area of a waste disposal cell or within the operational area of a treatment facility. • Treatment of a waste loads may only commence if all constituents of the treatment method are available in appropriate quantities. • Incompatible wastes must be treated separately.	TSAS	During waste treatment operations	Continuous	Operations Manager
10	Surface water Ground-water	To minimise impacts on surface water and groundwater quality and availability such that risks to the ecosystem and downstream	**Waste Disposal** • Waste may only be disposed of within the lined area of waste cells. • The landfill form and slopes of the waste body must be managed to ensure stability of the waste body. • The final height of the waste body must not exceed the height limit indicated in the approval. • The landfill form must be managed to minimize ingress of rainfall into the waste body.	Site inspections and audits	Duration of operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
		users are prevented.	• Leachate must be contained in an appropriate PCD.				
11	Visual	To maintain site aesthetics and limit visual impacts to public receptors.	• The project site and lands adjacent to it must be kept clean of debris, graffiti, fugitive waste, or waste generated on the site. • Operating facilities must be actively maintained during operation. • Where possible, landfill operation must be restricted to daylight hours to negate or reduce the visual impacts associated with lighting. • The amount of security and operational lighting present on site must be limited as far as possible. • Light fittings for security at night must reflect the light toward the ground and prevent light spill as far as possible. • Lighting fixtures should make use of minimum lumen or wattage (whilst adhering to relevant safety standards). Use yellow or amber outdoor lights. • Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used (whilst adhering to relevant safety standards). • If economically and technically feasible, make use of motion detectors on security lighting. • Minimize the number of light fixtures to the bare minimum, including security lighting. • Avoid high pole top security lighting along the periphery of the site and only use lights activated on illegal entry to the site. • Buildings and mounting structures on the site should be painted with natural tones that fit with the surrounding environment. Fencing should be of the “see-through” variety.	Visual observations / checklist	During operations	Ongoing	Operations Manager
12	Surface water quality	To minimise impacts on	• Storm water controls must be implemented and maintained on a continuous basis for all areas of the Site to:	Site audits (as per the	Duration of operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
	Soils	surface water quality and availability such that risks to the ecosystem and downstream users are prevented.	• divert clean water away from the Site, and • drain and contain potentially contaminated storm water within containment structures at the Site. • Storm water runoff arising because of precipitation on land adjacent to the Site must be diverted around the Site to the environment in drains sized for rainfall events with a duration of 24 hours with an average frequency of once in every fifty years (1:50). • Storm water runoff arising from precipitation on the Site must be prevented from coming into contact with waste or other contaminating substance, where possible, and must be drained from the Site by means of drains sized for rainfall events with a duration of 24 hours with an average frequency of once in every fifty years (1:50). • Drains for clean storm water must be: o constructed of durable materials. o maintained to be functional and free of obstructions. • Storm water must be considered as contaminated when it arises from an operational area of the Site; or when its quality exceeds that specified in the General Standard, prescribed in terms Water Resources Management Act 11 of 2013, or with such quality requirements as determined by the Minister.	approval conditions)			
13	Surface water quality Ground-water quality	To minimise impacts on surface water and groundwater quality and availability such that risks to the ecosystem and downstream	• The Site's stormwater dams must be operated so as to prevent spills. • The integrity of containment barriers in storm water dams must be routinely monitored and corrective measures must be taken to ensure their integrity. • Stormwater dams must be maintained to be safe, functional impoundments and must be kept free of materials that reduce the storage capacity. Sediment must be removed on a regular basis to ensure that sufficient storage capacity is maintained.	Site audits (as per the approval conditions)	Duration of operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person

		users are prevented.	• A Liquid Management Model must be developed to demonstrate, on a monthly basis, that the Site has adequate storage capacity for storm water.
			• Contaminated storm water must be:
			  ○ Treated to comply with the appropriate standard and discharged in a legal manner;
			  ○ Discharged to sewer only if authorised by the relevant municipality; and/or
			  ○ Evaporated in dams and/or evaporated by spraying over lined portions of the landfill site.
			• Avoid, or minimise, the placement of infrastructure in drainage channels likely to support groundwater recharge.
			• Minimise the extent of dirty water areas and maximise the return of clean water to the environment;
			• Ensure maintenance of the surface water management infrastructure so that no spillage or erosion results.
			• All impervious surfaces to be monitored to ensure edges, drains, grates etc., are functional;
			• Ensure runoff water from the facility is directed towards a control structure where it is appropriately managed; and
			• Prevent sediments from entering the stormwater systems, through appropriate means, and clean sediments from stormwater systems regularly				

14	Ground-water quality	To avoid / minimise impacts on groundwater quality and availability such that risks to the ecosystem and downstream	• Water encountered in the sub-soil seepage or leachate detection system below containment barriers must be drained from the barrier system. If this water is clean it must be directed to the stormwater dam, if it is contaminated it must be contained in the PCDs. • Abstraction from the borehole should not exceed the sustainable yield estimated by the updated model. Records should be kept of monthly abstraction volumes.	Site audits (as per the approval conditions)	Duration of operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
		users are prevented.	• Water abstracted from the borehole should not be made available for human consumption unless chemical analysis indicates it complies with potable water standards. • Appropriate groundwater monitoring should be implemented to ensure drawdown does not exceed the water level determined through the associated yield analyses. It is expected that the permit issued by Department of Water Affairs must specify monitoring requirements.				
15	Leachate quality and management	To avoid / minimise impacts on surface water and groundwater quality and availability such that risks to the ecosystem and downstream users are prevented.	• Leachate levels in the waste bodies must be kept low by ongoing removal of leachate from the waste disposal cells to the PCD. • The total capacity of the Site's PCD must be of such a capacity as to contain all leachate expected as a result of disposal operations. • PCDs must be operated as empty as possible to ensure sufficient capacity is available at all times. • PCD must be operated with a free board of not less than 500 mm to maximum supply level (according to the engineering designs). • Emergency overflow from the PCD must be directed to a lined storm water dam. • PCD must be maintained to be functional, free of impoundments and materials that reduce the storage capacity. Sediment must be removed on a regular basis to ensure that sufficient storage capacity is maintained. • Maximise the removal of leachate from cells and liquids from subsoil drains and contain this in the appropriate facility; • A Liquid Management Model must be developed to demonstrate, on a monthly basis, that the Site has adequate storage capacity for leachate. • Leachate which has been treated by methods approved by the regulator may be:	Site audits (as per the approval conditions)	Duration of operations	Monthly (Liquid Management Model) Monthly liner inspections	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			• Discharged to sewer only if authorised by the relevant municipality; • Discharged in a legal manner; and/or • Evaporated by spraying over the PCD or lined portions of the landfill site. • Surface water runoff must be diverted away from PCD to the storm water dams. • The integrity of containment barriers in PCD must be routinely monitored and corrective measures must be taken to ensure their integrity. • Undertake sampling and analysis of groundwater, surface water, leachate detection, subsoil seepage and leachate quality via reliable and reproducible methods. The groundwater monitoring network (Appendix B) should be strategically developed to detect any potential seepage from the facility. This means, possibly incorporating existing boreholes, as well as considering drilling new boreholes. Leachate sampling and analysis must be undertaken per waste cell and repeated for any cell where there is a change in waste inputs, operating parameters or an observed change in leachate. The results of the leachate testing should be incorporated into subsequent numerical model updates. • The groundwater model should be updated with the relevant source terms once available.				
16	Effluent management	To avoid / minimise impacts on surface water and groundwater quality and	• Any effluent arising from the NMF may only be disposed to sewer if it meets the acceptance criteria set out in a discharge permit granted by the regulatory authority. • Sewage from Site facilities must be contained, treated and/or disposed to the waste disposal cells.	Discharge consent Site audits (as per the approval conditions)	Duration of operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
		availability such that risks to the ecosystem and downstream users are prevented.					
17	Human health and safety	To enhance human health, safety and security.	• Risk assessments must be undertaken for all critical processes and activities at the Site. • Where significant risks are identified an action plan must be developed and implemented. • The Emergency Preparedness and Response Plan (EPRP) must be updated to include response actions to counter risks and emergencies. • If internal or external audits identify risks not previously or adequately considered, then these must be subject to a risk assessment.	Update risk assessments and EPRP (as required in the Operating Manual)	Duration of operations	At change of operations or after an emergency	Operations Manager / Compliance Officer/Manager

18	Social
	
	Stakeholder management
		To support open and transparent communication between the Site management and stakeholders.	• Namwaste employee activities must be restricted to the Namwaste site unless explicitly tasked or authorised.
			• Namwaste must maintain complaints register for external stakeholders and follow up with close out actions after investigating the complaint(s)
			• Develop and implement a stakeholder engagement plan and grievance mechanism.
			  • Educate the community regarding hazardous waste and the potential health impacts.
			  • Provide information sessions to the community regarding the facility as and when required
				Stakeholder engagement plan
				
				Committee Meeting minutes
					Duration of operations	Bi-annual	Operations Manager

19	Social	Community support	• Engage with community stakeholders to develop meaningful strategies for community development. • Ensure that funding requirements for each project are considered into the future so that projects are viable and sustainable.	Stakeholder engagement plan	Duration of operations	Continuous	Operations Manager/Compliance Officer/Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			• Set clear goals for each project and phase out funding once these goals are achieved.	Project progress plans			
20	Social	Local employment Local content Training	• Maximise the use of local skills and resources through preferential employment of locals where practicable. • Develop, communicate and implement a fair and transparent labour and recruitment policy. • Ensure diversity and gender equality in recruitment, as far as possible. • Develop a training plan outlining the process for the upskilling and training of Namibian Nationals to ensure the facility is locally run within the proposed timeframes.	Number of locals employed Training plan	Duration of operations	Continuous	Operations Manager/Compliance Officer/Manager
21	Terrestrial ecology	To minimise disturbance / avoid the impact to terrestrial biodiversity and related ecosystem functionality on land surrounding the site.	• Edge effects such as erosion, stormwater runoff, and AIP proliferation, which may affect adjacent or downstream sensitive habitat, need to be strictly managed adjacent to the footprint areas; • Ongoing AIP monitoring and clearance should take place throughout the Operational Phase of the project. • Management of AIPs during the operational-phase activities must be focused on limiting their introduction and preventing their spread. For example, roadsides should be monitored, as they serve as common corridors along which AIP species are introduced and dispersed, and disturbed areas should regularly be monitored for AIP recruitment until successfully rehabilitated. • The project perimeters should regularly be checked for AIP proliferation to prevent spread into surrounding natural areas; • Concurrent rehabilitation should be implemented within the study area, rehabilitating bare (non-vegetated) areas as soon as they become available. • Rehabilitation must aim to establish surface profiles and textures that fit with the landscape and only utilise locally appropriate, indigenous plant species.	Site audits Visual observation checklist AIP Soil analysis	Operational and maintenance phase activities	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			• Introduce and enforce speed limits on all vehicles; maintain speed limits on site to minimise wind erosions; educate and sensitise personnel to avoid driving on bare rocky hillsides and mountains and other areas prone to soil erosion. • The baseline soil reference points chemistry considered when selecting the road dust suppression method which must be implemented on-site, to ensure minimal potential soil resource degradations occur during the life-span of the project.				
22	Surface water quality Groundwater quality Soil	To minimise impacts on surface water quality and loss of soil resource and availability such that risks to the ecosystem and downstream users are prevented.	**Site Infrastructure** • All oils, chemicals and other hazardous materials must be stored in covered, bunded areas. • All spills must be contained within dedicated bunded areas (at shunt yard, wash bays, workshops, waste handling areas, chemicals handling areas, etc.) • The treatment by-products generated by the operational activities must be stored in skips or tanks, located within lined, bunded areas until placed on the waste cells or removed from site. • All pipeline routes must be inspected regularly to enable early detection of leaks. • An inspection and maintenance plan must be implemented on the storm water system and PCDs to ensure that the system remains operational, unblocked and free flowing at all times. • When sediment levels reach a pre-determined level in the PCDs, sediment must be removed to ensure that sufficient storm water storage capacity is always maintained. • A surface water quality monitoring programme must be implemented	Surface water and groundwater inspection and maintenance plans Surface water and groundwater quality monitoring programmes Monitoring reports	Operational activities	Monthly / Quarterly Bi-annual for leaks and sub-soil seepage	Operations Manager
23	Hydropedo-logy	To avoid / minimise impacts on soil	• Clean water must be diverted and discharged back into the downgradient systems.	Surface water monitoring	Operational activities	As and when required	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
		and maintain the integrity of watercourses within the project footprint	• Any discharge of water must be done in a diffuse manner by means of a slow and gradual process through an energy dissipating structure or stilling basin to reduce velocity of the discharging water to avoid sudden flow velocity and volume increases or concentrated flows, which may result in erosion and flow channel incision.				
24	Community Development, Local Employment and Local Content	Maximise benefit to local communities	• Maximise use of local skills and resources through preferential employment of locals where practicable. • Develop, communicate and implement a fair and transparent labour and recruitment policy. • Ensure diversity and gender equality in recruitment, as far as possible. • Provide training to staff before and/or during the construction phase where possible and practicable. • Work with relevant stakeholders to identify local businesses and contractors providing the required services. • Source as many goods and services as possible from the local and regional economy (e.g. use local contractors and accommodation and equipment suppliers as far as possible and purchase perishable goods locally). • Provide suitable training to service providers, where possible and practicable. • Develop and implement a fair and transparent procurement policy.	Number of local people employed compared to total number of people employed. Numbers for woman to be indicated. Number of persons receiving training	Operational activities	Continuous	Operations Manager
25	Environmental Awareness Training	Ensure all staff is aware of the EMP, to ensure compliance.	• Environmental awareness training must include as a minimum the following: o Description of significant environmental impacts, actual or potential, related to their work activities;	Training Records to include: A record of all environmental awareness training courses	Prior to construction	Monthly and as when required	Compliance Officer/Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			○ Mitigation measures to be implemented when carrying out specific activities; ○ Emergency preparedness and response procedures; ○ Emergency procedures; ○ Procedures to be followed when working near or within sensitive areas; ○ Wastewater management procedures; ○ Water usage and conservation; ○ Solid waste management procedures; ○ Sanitation procedures; ○ Fire prevention; and ○ Disease prevention. • Environmental training should be undertaken in English with reasonable accommodations for a secondary language (most common amongst the workforce). • The ECC Holder must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course. • Refresher environmental awareness training must be available as and when required. • All staff must be made aware of the conditions and controls linked to the ECC and within the EMP and made aware of their individual roles and responsibilities in achieving compliance with the ECC and EMP. • The ECC Holder must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: ○ Safety notifications; and ○ Relevant E&S topics (e.g.): ▪ Windblown litter	undertaken as part of the EMP must be available. A staff attendance register of all staff who have received environmental awareness training must be available.			

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			▪ Risks associated with leachate; ▪ Offroad driving; ▪ Dust; ○ Traffic safety.				
26	Operations	Minimise project impact beyond project boundary	• Identify access restricted areas, that have been informed by the environmental assessment, site walk through, and any additional areas identified during development and construction. • Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate. • Unauthorised access and development related activity inside access restricted areas is prohibited.	Photographic record Access control register	Prior to construction	Continuous	Operations Manager
27	Soils	Prevention of loss of land capability, soil erosion and soil fertility	• Ensure maintenance of the surface water management infrastructure so that no erosion results. • Prevent the disturbance of land beyond the approved infrastructure footprint. • Rehabilitation of the waste cells and associated infrastructure must be initiated from the onset of the Project or progressively as soon as practically possible through the operation phase. Soil stripped from infrastructure placement should be used for rehabilitation of disturbed areas. • Rehabilitation must aim to establish surface profiles and textures that fit with the landscape and only utilise locally appropriate, indigenous plant species. • Rehabilitated areas must be inspected and maintained until they are stable and self-sustaining.	Monitoring of disturbed areas	During operations	Continuous	–Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			• Dust suppression methods should be implemented on access roads with higher traffic volumes to minimise wind erosion and dust. • Introduce and enforce speed limits on all vehicles; maintain speed limits on site to minimise wind erosions; educate and sensitise personnel to avoid driving on bare rocky hillside and other areas prone to soil erosion. • Ensure that soil is well aerated and not waterlogged due to site drainage by ensuring minimal water leakage periods exposure of any possible leakages from stormwater channels/drains within the site, though limited due to the arid conditions. • Timely maintenance and repair of the waste management facility components (leachate dams, stormwater management infrastructure, waste treatment facilities etc) must be done so as to, as it can reduce uncontrolled leakages to the soil				
29	Stormwater	Stormwater management	• Monitoring and inspection of stormwater management infrastructure outlets for signs of erosion, cracking, silting and blockages is recommended, to ensure efficient performance. • Monitoring should be undertaken monthly during the wet season and after storm events • • Stormwater management infrastructure must be developed and maintained to divert clean water away from the facility and contain all dirty water arising on the site, with adequate freeboard to prevent overtopping in the case of a 1:50 year flood event.	On site inspection Compliance with Stormwater Management Plan	During operations	Continuous As per the SWMP	Operations Manager
30	Groundwater abstraction	Ensuring sustainable abstraction	• The placement, drilling, and construction of abstraction borehole(s) should be informed by a qualified geohydrologist. • The sustainable abstraction rate(s) and proposed period(s) of pumping should be incorporated into	Monitoring of groundwater levels	During operations	Continuous	Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Person
			groundwater abstraction model(s) and drawdown(s) must be analysed. • Abstraction from the borehole(s) should not exceed the sustainable yield(s) estimated by the model(s). • Records should be kept of monthly abstraction volumes. • Water abstracted from borehole(s) should not be made available for human consumption unless chemical analysis indicates it complies with potable water standards. • Appropriate groundwater monitoring should be implemented to ensure drawdown(s) does not exceed the water level(s) determined through the associated yield analyses. Monitoring should comply with the requirements set out in the permit(s)issued by the Ministry of Agriculture, Water and Land Reform: Department of Water Affairs.				
31	Air quality Land use	To minimise / manage air pollution nuisance (dust and odour), noise and prevent health impacts to public receptors.	• Apply separation distances or buffers to ensure that incompatible land uses are located in a way that minimises impacts caused by noise, odour, nuisance dust, polluting air emissions and/or water polluting activities. • Namwaste must interrogate all land use planning applications within the buffer zone and challenge those that propose land uses which are incompatible with the buffer zone requirements.	Maintain a buffer zone Maintain a complaints register for external grievances	Operations phase	Ongoing	Construction Engineer & Operations Manager Compliance Manager (monitoring)

4.2 Support Infrastructure

4.2.1 Environmental outcomes and actions for the planning and design

Impact management outcome: All relevant environmental impacts and factors are considered during the planning processes. All the relevant permits and licences are in place to ensure compliance with regulatory requirements.

Table 4-5: Environmental outcomes and actions related to the planning and design activities regarding the support infrastructure

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Planning and design	Zero habitat destruction/ disturbance outside project area. Minimal habitat disturbance by project footprints.	• Minimise the corridor width to a maximum of 3 metres either side of the pipe as far as practically possible. • Design the power line and pipeline access and maintenance roads so that both can be reached by the same road, and you do not create two parallel corridors. • Cross drainages by the shortest routes possible and where drainages have a sandy substrate, bury the pipe. • Design site drainage and stormwater runoff to minimise risk of erosion. • The pipeline should be elevated in rocky drainages and also at the top of rocky ridges to alleviate the barrier effect and allow invertebrates, reptiles, and amphibians to pass. • The pipeline should be buried in sandy drainages and intermittently along its length to alleviate the barrier effect and allow invertebrates, reptiles, and amphibians to pass. • Cross drainages by the shortest routes possible and where drainages have a sandy substrate, bury the pipe	Visual Inspection Post-construction survey with a Terrestrial Biodiversity Specialist of the infrastructure corridor Inspections and audits	Prior to construction commencing	Before construction commences during site walk over	Namwaste

4.2.2 Environmental outcomes and actions for the site establishment phase

Impact management outcome: Impacts on the environment are minimised during construction of the support infrastructure components, namely a by-pass road, overhead line and water pipeline, and disturbance is kept to a minimum and within the approved area.

Table 4-6: Environmental outcomes and actions related to the site establishment activities regarding the support infrastructure

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Air Emissions	No complaints from neighbouring land users	• Adopt suitable measures to manage fugitive dust from vegetation clearing during the construction phase. This will include a programme of dust management that limits both occupational and community exposure to dust. • Adopt measures to control fugitive dust generated from construction traffic including limiting construction vehicles speeds to the 20 km/hr on unpaved access road to site and on site. • Ensure that exposed areas and material stockpiles are adequately protected against the wind (e.g. wetting exposed soil/ gravel areas during windy conditions, covering of material stockpiles, etc.). • Ensure that the location of stockpiles take into consideration the prevailing wind directions and locations of sensitive receptors. • All construction vehicles should be fitted with a telemetry system to monitor fuel consumption and driver behaviour (e.g., excessive breaking, idling, and so on) in order to reduce liquid fuel consumption. • When higher-than-average consumption is detected, appropriate action should be taken against the driver. • Speed limits, truck weights and the number of vehicles using unpaved roads/ surfaces should be reduced as far as practicable. Speed limits should be below 20 km/h onsite. Speed limits should also be controlled on the Trekkopje Road (unpaved).	Visual monitoring of fugitive dust (particulate matter) emissions. Monitoring of complaints by local communities.	During site clearing	Ongoing	Contractor

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
2	Noise Emissions	No complaints from neighbouring land users	• Construction activities should only occur during daytime hours, preferably between 6 am and 6 pm. • Equipment and vehicles should always be in good working order and undergo regular servicing. • A maintenance plan and register of vehicles and equipment should be provided and maintained by the contractor and be submitted to the ECO. • The permitted construction area footprint should be demarcated, and vehicles must not be permitted beyond the boundaries. • Vehicles and auxiliary power systems should be turned off when not in use. Warm-up idling should not be permitted.	Complaints from local communities	Site establishment	Ongoing	Contractor
3	Visual	Minimise visual disturbance	• Adopt responsible construction practices that strictly contain the construction/ establishment activities to demarcated areas • Earthworks should be executed so that only the footprint and a small 'construction buffer zone' around the proposed activities are exposed. In all other areas, the naturally occurring vegetation/gravel plains should be retained, especially along the periphery of the site and the powerline and bulk water supply pipe routes servitudes. • Disturbed areas, not occupied by infrastructure, should be effectively rehabilitated post-construction. • Rehabilitation must aim to establish surface profiles and textures that fit with the landscape and only utilise locally appropriate, indigenous plant species	Inspection of the disturbed areas	Site establishment	Ongoing	Contractor
4	Terrestrial Ecology	Zero habitat destruction/ disturbance outside project area. Minimal habitat disturbance by	• Start re-vegetation as soon as possible after construction. • Keep the overall development footprint as small as possible. • No off-road driving or driving next to established roads/ tracks should be allowed. • All roads and tracks should be planned to minimise fragmentation or disturbance of habitats.	Visual Inspection Post-construction survey with a Terrestrial Biodiversity	Site establishment Post-construction	On-going during construction Post-construction survey – 2 surveys at 2	Contractor

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
		project footprints.	• Drive around instead of across ridges where possible, and if not, then cross ridges at their lowest points and at points where the vegetation is least dense. • Anti-erosion measures should be taken where roads and tracks cross a wash or drainage line. • Water flow in all washes should be unimpeded. • Carefully plan the placement of stockpiling construction material to avoid sensitive areas. • Limit construction activities to daytime hours to reduce noise and minimise the disturbance of animals in their daily foraging and movement behaviour. • Position temporary construction infrastructure in areas that will definitely be disturbed during operations, as far as possible. • Identify nests, dens, burrows, and other breeding locations, demarcate them, and avoid these sites. If avoidance is not possible, commission specialists to relocate the animals. • Reptiles that are exposed during ground clearing should be captured for translocation by a qualified expert. • No collection of plants should be allowed. • Avoid damage to soil crust by staying on designated roads and restricting foot and vehicle traffic to the project site. • Limit driving to daylight hours because many reptiles are nocturnal and at risk from vehicle collisions. • Invite the National Botanical Research Institute (NBRI) to assess threatened species and commission them to relocate plants where possible. • No fires should be allowed. • Train all staff and contractors how to interact with wildlife in a sensitive and situation-appropriate manner. • Train all staff, contractors and construction staff on the reasons and methods for track discipline, and make sure	Specialist of the infrastructure corridor Inspections and audits		month intervals	

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			that unskilled labourers are also aware of the severity of the problem, not only top management. • If signs are used next to roads, ensure that the wording is clear and written in an appropriate tone. • Penalty clauses in contracts, fines and removal from site should be used as deterrents, and an ECO should be on site at all times to monitor compliance. • Power line: o Keep construction activities confined to the sites where poles will be located, and directly underneath the cables where unavoidable. Where the cables cross ridges, ensure that construction staff use one access route and not make multiple sets of tracks. • Pipeline/powerline corridor: o Use the same road during construction and for maintenance during operations. o The road should be close to the power line to ensure a narrow strip of disturbance or use the existing road where possible. o Excavated and laid-down soil should be levelled. o Strictly enforce a no-go policy outside the boundaries of the corridor. o Erect linear structures as close as possible to existing roads and tracks. o Do not put pylons on the tops of ridges but rather between two lower ridges with the cables running over the summit – this avoids an access road to the summits of ridges. o Use the existing road (Trekkopje Road) for construction and maintenance access where				

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			practical, instead of making new tracks or roads for the linear developments.				
5	Soil Erosion	Minimal incidents of erosion	• The placement of soil stockpiles must be identified prior to commencement of construction to minimise soil erosion. • Land clearance must be undertaken just prior to construction of a particular activity and unnecessary land clearance must be avoided. Work areas must be clearly defined to avoid disturbance outside of the footprint. • Construction vehicles to remain on designated prepared roads.	Visual inspection (erosion and rehabilitation) Proper topsoil stockpile management	Site establishment	Bi-weekly	Contractor
6	Fire	No fire related incidents	• No open fires shall be allowed on site, unless in safe areas specially demarcated for that purpose. • Ensure that the telephone number of the local Fire and Emergency Service is displayed at the site offices. • Ensure suitable fire-fighting equipment is provided on site. As a minimum this should include fire extinguishers, fire suppression system (as required, e.g., in power cabins) and a mobile water bowser. • Appoint a fire officer(s) from the staff who shall be responsible for ensuring immediate and appropriate action in the event of a fire as well as maintenance of the fire-fighting equipment. The appointed fire officer shall notify the local Fire and Emergency Services in the event of a fire and shall not delay doing so until such time as the fire is beyond his/ her control. • Take all reasonable steps to prevent the accidental occurrence or spread of fire. • Ensure that all site personnel are aware of the procedure to be followed in the event of a fire. • Hot-work (e.g. welding, grinding, cutting torch, etc.) must take place in specially designated areas only. • Smoking is not allowed on site, other than at designated smoking points. Cigarette butts shall not be discarded on the ground.	Inspection and checklist	Site establishment	Weekly	Contractor

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
7	Lighting	Limit disturbance beyond project footprint	• Ensure that any lighting installed on the site does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding users/ local communities and fauna. • Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the site. • Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on illegal entry to the site. • Minimise the number of light fixtures to the bare minimum, including security lighting. • During construction security lighting should only be used where necessary and carefully directed, preferably away from potential sensitive viewing areas. • Outdoor lights should be directed downwards and not up into the sky. • Direct the lights to shine exactly where illumination is needed. • Use yellow or amber outdoor lights because invertebrates don't detect yellow light as well as white. • Install insect screens in doors and windows located in buildings that are used after sunset.	Visual inspection Monitor community complaints with respect to light.	Site establishment	Weekly	Contractor
8	Concrete Mixing	Limit disturbance beyond project footprint	• Concrete should be mixed within a mixing tray and/or ready mix should be utilised. • If ready-mix cement is not brought to site, concrete batching activities and/or mixing shall be located within areas of low environmental sensitivity. • Concrete mixing directly on the ground shall not be allowed and shall only take place on impermeable surfaces. • If concrete mixers are washed on site, then contaminated runoff water must be channelled to an impermeable collection point.	Inspection and checklist	Site establishment	Ongoing	Contractor

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Washing of excess concrete into the ground or water resources is prohibited. • All cement-contaminated runoff from mixing areas shall be strictly controlled. • At the end of the contract, any ponds used for contaminated water collection shall be dried out and the solids disposed of appropriately. • Unused (full) cement bags shall be stored out of the rain and where runoff will not affect them; • Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis. • All excess concrete and aggregate shall be removed from site on completion of concrete works and disposed of appropriately.				
9	Construction Laydown Areas	Limit disturbance beyond project footprint	• The construction laydown areas shall be located at an easily accessible point and within an area of low environmental sensitivity i.e. avoid drainage lines. • The construction laydown areas shall be demarcated by a fence. • Suitable sanitary arrangements will be provided. There should be minimum one toilet for every 15 workers on site. Toilets must be easily accessible and shall be secured in order to prevent them from blowing over. • Ensure that all ablution facilities are maintained in a clean and sanitary condition. • Ensure that there is no spillage when the chemical toilets are cleaned and that the contents are properly removed from site. • Establish eating areas with adequate temporary shade to ensure that employees do not move off-site to eat. • Provide adequate refuse bins at all eating areas and ensure that all eating areas are cleaned up on a daily basis. • Ensure that there is access to clean drinking water for all employees on site. If water is stored on site, drinking	Inspection and checklist	Site establishment	Ongoing	Contractor

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			water and multi-purpose water storage facilities shall be clearly distinguished and demarcated.				
10	Surface Water Flooding Alteration of Natural Drainage Patterns and Flow Groundwater quality	Minimum alteration of surface water channels	• Minimise the disturbance of soils as much as possible by restricting construction activities within demarcated areas. • Avoid, or minimise, the placement of infrastructure in drainage channels likely to support groundwater recharge • Phasing/ scheduling of earthworks should be implemented to minimise the footprint that is at risk of erosion at any given time, or schedule works according to the season. Construction is recommended for months or seasons where there is less rainfall. • Progressive rehabilitation of disturbed land should be carried out to minimize the amount of time that bare soils are exposed to the erosive effects of rain and subsequent runoff. • Traffic and movement over stabilised areas should be controlled (minimised and kept to certain paths), and damage to stabilised areas should be repaired timeously and maintained. • In case of an occurrence of a discharge incident that could result in the pollution of surface water resources, an emergency response procedure should be implemented. • Maintenance of vehicles to be undertaken in a bunded lined area or off-site the project area. • A spill kit must be kept on-site and be easily accessible. • Good housekeeping practices should be implemented and maintained by timeous cleaning-up of accidental spillages. Waste should be disposed to a licensed waste site. In addition, spill cleaning kits and material safety data sheets (MSDS) for chemical and hazardous substances should be accessible and available.	Visual Inspection (audit checklist) Topsoil records Water quality monitoring	During site clearing and construction	Ongoing	Contractor

4.2.3 Environmental outcomes and actions for the construction phase

Impact management outcome: Impacts on the environment are minimised during construction of the support infrastructure components, namely a by-pass road, overhead line and water pipeline, and disturbance is kept to a minimum and within the approved area.

Table 4-7: Environmental outcomes and actions related to the construction activities regarding the support infrastructure

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Air Emissions	No complaints from neighbouring land users	• Adopt suitable measures to manage fugitive dust from vegetation clearing during the construction phase. This will include a programme of dust management that limits both occupational and community exposure to dust. • Adopt measures to control fugitive dust generated from construction traffic including limiting construction vehicles speeds to the 20 km/hr on unpaved access road to site and on site. • Ensure that exposed areas and material stockpiles are adequately protected against the wind (e.g. wetting exposed soil/ gravel areas during windy conditions, covering of material stockpiles, etc.). • Ensure that the location of stockpiles take into consideration the prevailing wind directions and locations of sensitive receptors. • All construction vehicles should be fitted with a telemetry system to monitor fuel consumption and driver behaviour (e.g., excessive breaking, idling, and so on) in order to reduce liquid fuel consumption. • When higher-than-average consumption is detected, appropriate action should be taken against the driver. • Speed limits, truck weights and the number of vehicles using unpaved roads/ surfaces should be reduced as far	Visual monitoring of fugitive dust (particulate matter) emissions. Monitoring of complaints by local communities.	During construction	Ongoing	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			as practicable. Speed limits should be below 20 km/h onsite. Speed limits should also be controlled on the Trekkopje Road (unpaved).				
2	Noise Emissions	No complaints from neighbouring land users	• Construction activities should only occur during daytime hours, preferably between 6 am and 6 pm. • Equipment and vehicles should always be in good working order and undergo regular servicing. • A maintenance plan and register of vehicles and equipment should be provided and maintained by the contractor and be submitted to the ECO. • The permitted construction area footprint should be demarcated, and vehicles must not be permitted beyond the boundaries. • Vehicles and auxiliary power systems should be turned off when not in use. Warm-up idling should not be permitted.	Complaints from local communities	During construction	Ongoing	Contractor ECO (monitoring)
3	Visual	Minimis visual disturbance	• Adopt responsible construction practices that strictly contain the construction/ establishment activities to demarcated areas • Earthworks should be executed so that only the footprint and a small 'construction buffer zone' around the proposed activities are exposed. In all other areas, the naturally occurring vegetation/gravel plains should be retained, especially along the periphery of the site and the powerline and bulk water supply pipe routes. • Disturbed areas, not occupied by infrastructure, should be effectively rehabilitated post-construction. • Rehabilitation must aim to establish surface profiles and textures that fit with the landscape and only utilise locally appropriate, indigenous plant species	Inspection of the disturbed areas	During construction	Ongoing	Contractor ECO (monitoring)
4	Surface Water Flooding	Minimum alteration of surface water channels	• Minimise the disturbance of soils as much as possible by restricting construction activities within demarcated areas.	Visual Inspection (audit checklist)	During construction	Ongoing	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
	Alteration of Natural Drainage Patterns and Flow Groundwater quality		• Avoid, or minimise, the placement of infrastructure in drainage channels likely to support groundwater recharge • Phasing/ scheduling of earthworks should be implemented to minimise the footprint that is at risk of erosion at any given time, or schedule works according to the season. Construction is recommended for months or seasons where there is less rainfall. • Progressive rehabilitation of disturbed land should be carried out to minimize the amount of time that bare soils are exposed to the erosive effects of rain and subsequent runoff. • Traffic and movement over stabilised areas should be controlled (minimised and kept to certain paths), and damage to stabilised areas should be repaired timeously and maintained. • In case of an occurrence of a discharge incident that could result in the pollution of surface water resources, an emergency response procedure should be implemented. • Maintenance of vehicles to be undertaken in a bunded lined area or off-site the project area. • A spill kit must be kept on-site and be easily accessible. • Good housekeeping practices should be implemented and maintained by timeous cleaning-up of accidental spillages. Waste should be disposed to a licensed waste site. In addition, spill cleaning kits and material safety data sheets (MSDS) for chemical and hazardous substances should be accessible and available.	Topsoil records Water quality monitoring			
5	Terrestrial Ecology	Zero habitat destruction/ disturbance	• Start re-vegetation as soon as possible after construction. • Keep the overall development footprint as small as possible.	Visual Inspection	Construction Post-construction	On-going during construction	Contractor Operations Manager

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
		outside project area. Minimal habitat disturbance by project footprints.	• No off-road driving or driving next to established roads/ tracks should be allowed. • All roads and tracks should be planned to minimise fragmentation or disturbance of habitats. • Drive around instead of across ridges where possible, and if not, then cross ridges at their lowest points and at points where the vegetation is least dense. • Anti-erosion measures should be taken where roads and tracks cross a wash or drainage line. • Water flow in all washes should be unimpeded. • Carefully plan the placement of stockpiling construction material to avoid sensitive areas. • Limit construction activities to daytime hours to reduce noise and minimise the disturbance of animals in their daily foraging and movement behaviour. • Position temporary construction infrastructure in areas that will definitely be disturbed during operations, as far as possible. • Identify nests, dens, burrows, and other breeding locations, demarcate them, and avoid these sites. If avoidance is not possible, commission specialists to relocate the animals. • Reptiles that are exposed during ground clearing should be captured for translocation by a qualified expert. • No collection of plants should be allowed. • Avoid damage to soil crust by staying on designated roads and restricting foot and vehicle traffic to the project site. • Limit driving to daylight hours because many reptiles are nocturnal and at risk from vehicle collisions. • Invite the National Botanical Research Institute (NBRI) to assess threatened species and commission them to relocate plants where possible. • No fires should be allowed.	Post-construction survey with a Terrestrial Biodiversity Specialist of the infrastructure corridor Inspections and audits		Post-construction survey – 2 surveys at 2 month intervals	ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons

			• Train all staff and contractors how to interact with wildlife in a sensitive and situation-appropriate manner.
			• Train all staff, contractors and construction staff on the reasons and methods for track discipline, and make sure that unskilled labourers are also aware of the severity of the problem, not only top management.
			• If signs are used next to roads, ensure that the wording is clear and written in an appropriate tone.
			• Penalty clauses in contracts, fines and removal from site should be used as deterrents, and an ECO should be on site at all times to monitor compliance.
			• Power line:
			  ○ Keep construction activities confined to the sites where poles will be located, and directly underneath the cables where unavoidable. Where the cables cross ridges, ensure that construction staff use one access route and not make multiple sets of tracks.
			• Pipeline/powerline corridor:
			  ○ Use the same road during construction and for maintenance during operations.
			  ○ The road should be close to the power line to ensure a narrow strip of disturbance or use the existing road where possible.
			  ○ Excavated and laid-down soil should be levelled
			  ○ Strictly enforce a no-go policy outside the boundaries of the corridor.
			  ○ Erect linear structures as close as possible to existing roads and tracks.
			  ○ Do not put pylons on the tops of ridges but rather between two lower ridges with the cables				

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			running over the summit – this avoids an access road to the summits of ridges. ○ Use the existing road (Trekkopje Road) for construction and maintenance access where practical, instead of making new tracks or roads for the linear developments.				
6	Avifauna	Limit fatalities across the linear corridor No access into no-go areas	• Before construction starts, the proposed power line route should be inspected for any signs of bird nesting activity. Disturbance of nesting/ chick-rearing birds should be avoided • Implement operational controls to manage and regulate contractor activity, such as: ○ A speed limit should be strictly enforced. ○ The construction activity should be restricted to the actual construction site and no unnecessary movement of vehicles or people should be allowed outside the construction zone. All vehicles should be fitted with silencers. ○ Exclusion fencing should be erected around identified sensitive areas, if required (e.g., pre-identified active nesting sites). ○ During induction to contractors, poaching must be discussed as something that will not be tolerated. Offenders must be reported to the relevant authorities. • Ongoing awareness should be promoted amongst construction workers and staff about the value of biodiversity and the negative impacts of disturbance, especially to breeding birds, and of poaching and road mortality. • Micro-siting: where possible avoid the unnecessary destruction of habitat or degradation of the environment; water courses and drainage lines are particularly sensitive.	Prior to construction and monthly after construction started. Post-construction survey The entire length of the power line should be monitored for bird carcasses Animal Fatality records/photographic evidence	Construction	Construction: 3 days (repeated twice at 2-month intervals) Operations: Once a month for the first year after construction. Thereafter the route should be patrolled every 3 months.	Contractor Operations Manager ECO (Monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Rehabilitate degraded or damaged biodiversity features and ecosystem services that cannot be completely avoided and/or minimised, e.g., by restoration of temporary-use and lay-down areas as soon as reasonably practicable after construction activities are complete. • Implement operational controls to manage and regulate contractor activity, such as exclusion fencing around sensitive areas (e.g., pre-identified active nest sites), designated machinery and lay-down areas, minimisation of vegetation loss and disturbance to soil; managing the timing of vegetation control activities at suitable intervals. • Ongoing awareness should be promoted about the value of biodiversity and the negative impacts of habitat destruction. • Ensure strict and effective waste management (including of food) during construction activities, to discourage an unnatural increase in scavenging species such as Pied Crow. • Avoid creating new habitats with open water, e.g., accumulations of stormwater or pipe leakages/ open water/ run-off, that may attract birds. • Powerline: o Adopt a pole / wire configuration design that is considered by industry standards to have the lowest risk of bird electrocution. o Construct and install bird perches and/or anti-perch devices above dangerous structures on poles. This is a measure that can also be retrofitted where monitoring indicates that electrocution is prevalent at a specific pole. o Fit insulation (of appropriate specification for the voltage) to conductor wires and insulators supporting the cables, or the grounded crossarms				

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			○ Reconfigure jumper wires to pass under the crossarm rather than over it and offset jumpers where possible. ○ It is recommended that the powerline section from -22.393676°, 14.969052° to -22.290892°, 14.909888° be fitted with diverters. ○ Diverters should be fitted on the top conductor, 10 meters apart along the full length of each span, and with alternating, contrasting colours (e.g. black alternating with yellow). a. The marking distance between diverter devices on each line should be 10 m; the colours should be offset where possible (e.g., black and white/ yellow). b. At this stage, no nocturnally visible marking is recommended, but it should become mandatory should monitoring results indicate the necessity (e.g., repeat collisions of any nocturnal fliers such as flamingos or owls on power lines), using an adaptive management approach. • The need for retro-fitting any mitigation for collisions on stay wires (e.g., marking with vibration dampers) should also be based on monitoring results, using an adaptive management approach.				
7	Alien Invasive Vegetation	Limit the establishment and proliferation of alien invasive species	• Alien invasive plant control through: ○ Implementation of an alien invasive species management plan. ○ On-site alien invasive plant monitoring and control (removal and disposal); and ○ Sourcing of material for road or pylon construction: any requirement for fill material should be sourced from weed free areas to minimise the risk of spreading alien invasive species and to reduce the ongoing maintenance requirements.	Implementation of invasive species management plan	Construction	Ongoing	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Alien invasive seedlings and saplings must be removed as they become evident for the duration of construction. • Staff must be educated and made aware of alien vegetation that could be present and that must be eradicated. • Clearing of vegetation should be limited to the development footprint areas. • Access roads should be planned in areas that have already been disturbed or transformed to limit additional fragmentation within the landscape and additional loss of vegetative cover. • All construction vehicles and equipment, as well as construction material should be free of plant material when leaving the site to avoid contamination of road reserves. Therefore, all equipment and vehicles should be thoroughly cleaned prior to leaving the site.				

8	Hazardous Waste and Spills	Limit contamination of environment with hazardous waste	• Construction vehicles and equipment must be regularly serviced off site. Spills of fuel and lubricants from vehicles and equipment will be contained using a drip tray with plastic sheeting filled with adsorbent material.
			• Accidental spillage of potentially contaminating liquids and solids must be immediately contained and cleaned up by trained staff with the correct equipment and disposed of in an appropriate manner.
			• In the event of a hazardous spill:
			  ○ Immediately implement actions to stop or reduce the spill.
			  ○ Contain the spill.
			  ○ Arrange implementation of the necessary clean-up procedures.
			  ○ Collect contaminated soil, water and other materials and dispose of it at an appropriate waste disposal site.
				100% of hazardous waste disposed of (or recycled) at suitably licensed facilities.
				Zero non-compliances with EMP waste management requirements.
				Permits/ licenses for all waste transported and
					Construction	Monthly	Contractor
							ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• The Contractor shall ensure that a spill kit is kept on site and that staff are trained in its use to attend to any spillage of hydrocarbons • Hazardous wastes are separated and contained in compatible, appropriately labelled containers to prevent reaction with containers and spillage during handling. • Storage of hazardous waste to be located away from any ephemeral drainage lines. • Storage areas must have clear signage for the various hazardous waste streams. • Potentially contaminating fluids and other hazardous wastes must be contained in containers on hard, level surfaces in containers and covered from rain, and be clearly marked. • Develop and implement a site-specific Hazardous Waste Management Plan (HWMP) for the management, handling and disposal of hazardous waste streams. • Hazardous waste must be trucked out and disposed of at a licensed landfill site. A waste manifest must be kept for all hazardous wastes that are disposed of and maintained on site. • Potential treatment or disposal of sewage and contaminated soil is to be included in the HWMP.	disposal facilities used. Accurate waste tracking documents (including disposal records) available for all waste streams.			
9	Soil Erosion	Minimal incidents of erosion	• The placement of soil stockpiles must be identified prior to commencement of construction to minimise soil erosion. • Land clearance must be undertaken just prior to construction of a particular activity and unnecessary land clearance must be avoided. Work areas must be clearly defined to avoid disturbance outside of the footprint. • Construction vehicles to remain on designated prepared roads.	Visual inspection (erosion and rehabilitation) Proper topsoil stockpile management	Construction	Bi-weekly	Contractor ECO (monitoring)
10	Fire	No fire related incidents	• No open fires shall be allowed on site, unless in safe areas specially demarcated for that purpose.	Inspection and checklist	Construction	Weekly	Contractor

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Ensure that the telephone number of the local Fire and Emergency Service is displayed at the site offices. • Ensure suitable fire-fighting equipment is provided on site. As a minimum this should include fire extinguishers, fire suppression system (as required, e.g., in power cabins) and a mobile water bowser. • Appoint a fire officer(s) from the staff who shall be responsible for ensuring immediate and appropriate action in the event of a fire as well as maintenance of the fire-fighting equipment. The appointed fire officer shall notify the local Fire and Emergency Services in the event of a fire and shall not delay doing so until such time as the fire is beyond his/ her control. • Take all reasonable steps to prevent the accidental occurrence or spread of fire. • Ensure that all site personnel are aware of the procedure to be followed in the event of a fire. • Hot-work (e.g. welding, grinding, cutting torch, etc.) must take place in specially designated areas only. • Smoking is not allowed on site, other than at designated smoking points. Cigarette butts shall not be discarded on the ground.				ECO (monitoring)
11	Lighting	Limit disturbance beyond project footprint	• Ensure that any lighting installed on the site does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding users/ local communities and fauna. • Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the site. • Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on illegal entry to the site. • Minimise the number of light fixtures to the bare minimum, including security lighting.	Visual inspection Monitor community complaints with respect to light.	Construction	Weekly	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• During construction security lighting should only be used where necessary and carefully directed, preferably away from potential sensitive viewing areas. • Outdoor lights should be directed downwards and not up into the sky. • Direct the lights to shine exactly where illumination is needed. • Use yellow or amber outdoor lights because invertebrates don't detect yellow light as well as white. • Install insect screens in doors and windows located in buildings that are used after sunset.				
12	Concrete Mixing	Limit disturbance beyond project footprint	• Concrete should be mixed within a mixing tray and/or ready mix should be utilised. • If ready-mix cement is not brought to site, concrete batching activities and/or mixing shall be located within areas of low environmental sensitivity. • Concrete mixing directly on the ground shall not be allowed and shall only take place on impermeable surfaces. • If concrete mixers are washed on site, then contaminated runoff water must be channelled to an impermeable collection point. • Washing of excess concrete into the ground or water resources is prohibited. • All cement-contaminated runoff from mixing areas shall be strictly controlled. • At the end of the contract, any ponds used for contaminated water collection shall be dried out and the solids disposed of appropriately. • Unused (full) cement bags shall be stored out of the rain and where runoff will not affect them; • Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis.	Inspection and checklist	Construction	Ongoing	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• All excess concrete and aggregate shall be removed from site on completion of concrete works and disposed of appropriately.				
13	Construction Laydown Areas	Limit disturbance beyond project footprint	• The construction laydown areas shall be located at an easily accessible point and within an area of low environmental sensitivity i.e. avoid drainage lines. • The construction laydown areas shall be demarcated by a fence. • Suitable sanitary arrangements will be provided. There should be minimum one toilet for every 15 workers on site. Toilets must be easily accessible and shall be secured in order to prevent them from blowing over. • Ensure that all ablution facilities are maintained in a clean and sanitary condition. • Ensure that there is no spillage when the chemical toilets are cleaned and that the contents are properly removed from site. • Establish eating areas with adequate temporary shade to ensure that employees do not move off-site to eat. • Provide adequate refuse bins at all eating areas and ensure that all eating areas are cleaned up on a daily basis. • Ensure that there is access to clean drinking water for all employees on site. If water is stored on site, drinking water and multi-purpose water storage facilities shall be clearly distinguished and demarcated.	Inspection and checklist	Construction	Ongoing	Contractor ECO (monitoring)
14	Community Development, Local Employment and Local Content	Maximise benefit to local communities	• The competitive bidding process should include providing a recruitment weighting for the component of Namibian staff employed at all levels of its workforce. • The bidding process should include proposals to involve Namibian Small and Medium Enterprises to be involved (e.g. using labour-based works) in the construction phase where feasible.	Number of local people employed compared to total number of people employed. Numbers for	Construction	Once (pre-construction)	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Namwaste must oversee that its contractors promote sound worker-management relationships and safe and healthy working conditions.	woman to be indicated. Review of contracts and conditions of employment (during HSE audit)			
15	Community Health, Safety and Security	Zero complaints from surrounding communities	• The construction contractor must operate an alcohol-free and drug-free worksite which will include daily testing of employees/ contractors on entry to the work site, at the beginning of shifts and at random times on duty. • The construction contractor must ensure that all armed security workers who may be engaged directly or by contract to provide security to the sites, are well trained so they do not cause a security risk to the workforce or nearby community. • Free condoms should always be in supply in every ablution block and toilet. • Namwaste should ensure there are penalty clauses in the contracts for non-compliance with these mitigation measures.	Number of community H&S incidents Implementation of a grievance mechanism	Construction	Monthly	Contractor ECO (monitoring)
16	Access, Traffic and Safety	Zero traffic incidents	• Only demarcated and approved access routes shall be used, routes and detailed schedule of deliveries shall be defined and approved by the Contractor. • Driving licences/ certificates and proof of training and adoption of driver's code of conduct shall be obtained from all delivery drivers. • Ensure that access through the site is always maintained for other road users and is in a suitable condition. • Ensure that all regulations relating to traffic management are observed. • Ensure that adequate traffic accommodation, signage and safety measures (as appropriate) are put in place on site.	Incidence logs Record of driver licences Site inspections	Construction	Continuous	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Ensure that any traffic and safety signage remain clear throughout the construction period and that it is replaced or relocated as appropriate at the end of the construction period.				
17	Occupational Health and Safety	Zero Incidents (LTI, Fatalities)	• The Contractor, and where relevant any third-party contractors, will adopt all required occupational health and safety requirements as stipulated in Namibia, as well as conform with any relevant international best practice standards. • This will include the establishment of occupational health and safety policies, procedures and actions during the construction phase that results in strict adherence to health and safety measures by the Contractor staff, third-party contractors and supply chain contractors. • Implement and manage an employee's noise management programme to manage noise induced hearing loss, according to the applicable regulation (Labour Act 1992, Occupational Health and Safety of Employees Regulation) • Provide Personal Protective Equipment (PPE), training and monitoring as well as ongoing safety checks and safety audits. • Provide adequate clean drinking water and safe food for all workers. • Workers will be provided with access to primary health care and basic first aid at worksites. • Develop and implement an internal Grievance Mechanism that is easily accessible to the employees, contractors and sub-contractors, through which complaints related worker rights and health and safety can be lodged and responded to. • Namwaste should ensure there are penalty clauses in the contracts for non-compliance with these mitigation measures.	1.H&S Inspections (compliance with H&S plans, procedures, Standard Operating Procedure (SOP), etc.) 2.H&S legal compliance audits Compliance with all applicable laws and regulations	Construction	1. Weekly Annually	Contractor ECO (monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Develop and implement an employee health awareness program to educate employees (and contractors) about the importance of drinking water and identifying the early signs of heat stroke/ dehydration; and				

18	Cultural Heritage	Zero heritage sites encountered/ impacted	• Ensure all activities are undertaken within the approved footprint areas.
			• Implementation of a chance find procedure.
			• Avoidance and management of known heritage resources with at least a 50-meter buffer.
			  ○ Potential hunting blind 22°17'8.628" S and 14° 54' 24.852" E;
			  ○ Potential seed digging 22°24'55.398" S and 14°59'58.902 E; and
			  ○ Potential grave sites 22°23'36.36" S and 14°58'20.00" E, as well as 22°23'36.46 S and 14°58'20.03 E
			• Develop and implement a site development plan to guide in situ conservation.
			• Implement required permitting processes and mitigations (e.g., excavations, sampling, etc.) if avoidance is not possible.
			• Monitoring of heritage features during construction and routine monitoring of land-clearing activities.
			• Contractors, Subcontractors, and employees should be sensitized to the procedures that must be followed in case of a discovery and the potential presence of archaeological resources that may be discovered during land-clearance and mechanical excavation activities.
			• Indication of known heritage features on development plans and demarcation of features.
				Visual inspections
				Records of any cultural sites encountered
					Construction	Weekly – During
						Monthly – first year
						2. Yearly thereafter
							Contractor
							ECO (monitoring)

4.2.4 Environmental outcomes and actions for the operational phase

Impact management outcome: Impacts on the environment are minimised during operations of the support infrastructure components, namely a by-pass road, overhead line and water pipeline, and disturbance is kept to a minimum and within the approved area.

Table 4-8: Environmental outcomes and actions related to the operational activities regarding the support infrastructure

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
1	Avifauna	Limit fatalities across the linear corridor No access into no-go areas	• Before construction starts, the proposed power line route should be inspected for any signs of bird nesting activity. Disturbance of nesting/ chick-rearing birds should be avoided • Implement operational controls to manage and regulate contractor activity, such as: ○ A speed limit should be strictly enforced. ○ The construction activity should be restricted to the actual construction site and no unnecessary movement of vehicles or people should be allowed outside the construction zone. All vehicles should be fitted with silencers. ○ Exclusion fencing should be erected around identified sensitive areas, if required (e.g., pre-identified active nesting sites). ○ During induction to contractors, poaching must be discussed as something that will not be tolerated. Offenders must be reported to the relevant authorities. • Ongoing awareness should be promoted amongst construction workers and staff about the value of biodiversity and the negative impacts of disturbance, especially to breeding birds, and of poaching and road mortality.	Prior to construction and monthly after construction started. Post-construction survey The entire length of the power line should be monitored for bird carcasses Animal and Bird Fatality records/photographic evidence	Operation	Construction: 3 days (repeated twice at 2-month intervals) Operations: Once a month for the first year after construction. Thereafter the route should be patrolled every 3 months.	Operations Manager CO/CM ECO (Monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			• Micro-siting: where possible avoid the unnecessary destruction of habitat or degradation of the environment; water courses and drainage lines are particularly sensitive. • Rehabilitate degraded or damaged biodiversity features and ecosystem services that cannot be completely avoided and/or minimised, e.g., by restoration of temporary-use and lay-down areas as soon as reasonably practicable after construction activities are complete. • Implement operational controls to manage and regulate contractor activity, such as exclusion fencing around sensitive areas (e.g., pre-identified active nest sites), designated machinery and lay-down areas, minimisation of vegetation loss and disturbance to soil; managing the timing of vegetation control activities at suitable intervals. • Ongoing awareness should be promoted about the value of biodiversity and the negative impacts of habitat destruction. • Ensure strict and effective waste management (including of food) during construction activities, to discourage an unnatural increase in scavenging species such as Pied Crow. • Avoid creating new habitats with open water, e.g., accumulations of stormwater or pipe leakages/ open water/ run-off, that may attract birds. • Powerline: o Adopt a pole / wire configuration design that is considered by industry standards to have the lowest risk of bird electrocution. o Construct and install bird perches and/or anti-perch devices above dangerous structures on poles. This is a measure that can also be retrofitted where monitoring indicates that electrocution is prevalent at a specific pole.				

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			○ Fit insulation (of appropriate specification for the voltage) to conductor wires and insulators supporting the cables, or the grounded crossarms ○ Reconfigure jumper wires to pass under the crossarm rather than over it and offset jumpers where possible. ○ It is recommended that the powerline section from -22.393676°, 14.969052° to -22.290892°, 14.909888° be fitted with diverters. ○ Diverters should be fitted on the top conductor, 10 meters apart along the full length of each span, and with alternating, contrasting colours (e.g. black alternating with yellow). c. The marking distance between diverter devices on each line should be 10 m; the colours should be offset where possible (e.g., black and white/ yellow). d. At this stage, no nocturnally visible marking is recommended, but it should become mandatory should monitoring results indicate the necessity (e.g., repeat collisions of any nocturnal fliers such as flamingos or owls on power lines), using an adaptive management approach. • The need for retro-fitting any mitigation for collisions on stay wires (e.g., marking with vibration dampers) should also be based on monitoring results, using an adaptive management approach.				
2	Cultural Heritage	Zero heritage sites encountered/ impacted	• Ensure all activities are undertaken within the approved footprint areas. • Implementation of a chance find procedure. • Avoidance and management of known heritage resources with at least a 50-meter buffer. ○ Potential hunting blind 22°17'8.628" S and 14° 54' 24.852" E;	Visual inspections Records of any cultural sites encountered	Operation	Weekly – During Monthly – first year Yearly thereafter	Operations Manager CO/CM ECO (Monitoring)

Ref #	Project Activity / Aspect	Environmental Management Outcome	Impact Management Actions and Methods for the Control Measures	Mechanism for Monitoring Compliance	Action Plan		
					Time Period	Frequency	Responsible Persons
			○ Potential seed digging 22°24'55.398" S and 14°59'58.902 E; and ○ Potential grave sites 22°23'36.36" S and 14°58'20.00" E, as well as 22°23'36.46 S and 14°58'20.03 E • Develop and implement a site development plan to guide in situ conservation. • Implement required permitting processes and mitigations (e.g., excavations, sampling, etc.) if avoidance is not possible. • Monitoring of heritage features during construction and routine monitoring of land-clearing activities. • Contractors, Subcontractors, and employees should be sensitized to the procedures that must be followed in case of a discovery and the potential presence of archaeological resources that may be discovered during land-clearance and mechanical excavation activities. • Indication of known heritage features on development plans and demarcation of features.				

4.3 Decommissioning

The waste disposal facility has been designed for a 62-year operational life (under Business Case 1), subject to market fluctuations. The waste treatment facility will be maintained/upgraded and used for the duration of the disposal facility's life. Decommissioning of the facilities, which are not required for post-closure long-term management and monitoring of the site, will require the dismantling of the equipment, the sale and final disposal of all components, the decontamination of any contaminated areas and the rehabilitation of the site to a condition suitable for an end land use.

The life of the disposal site is directly related to the rate of airspace utilisation. Once the site is near to its final levels a closure plan will be developed. The end land use will be determined through a consultative process.

The closure plan will include details regarding the post-closure long-term management and monitoring of the site.

5.0 Environmental Awareness and Training Plan

Environmental awareness is defined as “the growth and development of awareness, understanding and consciousness toward the biophysical environment and its problems, including human interactions and effect’. It is further stated that it is ‘the educational process that deals with the human interrelationships with the environment and that utilizes an interdisciplinary problem-solving approach with value clarification.”

As part of continual improvement in environmental management performance, health and safety awareness training should be provided to all employees in order to promote the effective implementation of the EMP actions.

5.1 Manner in which Namwaste intends to inform employees of the Environmental Risks

Namwaste must implement environmental awareness for employees at the NMF. The environmental awareness and training must provide the following:

- General environmental awareness;
- Explanation of the importance of complying with the approval and EMP;
- Inform employees of environmental risks which may result from their work;
- Advise of the way the risks should be dealt with to avoid pollution or degradation of the environment;
- Set out how to respond to emergency situations; and
- Remediation measures for such emergencies.

Through implementation of the environmental awareness plan and training, Namwaste must ensure that employees have the awareness and understanding to operate the NMF and implement the EMP to achieve the objectives of the environmental policy. Namwaste must ensure that employees involved in activities with potentially significant impact on the environment have greater environmental awareness and are competent to carry out their tasks based on appropriate education, training and/or experience.

In addition, all contractors that conduct work at the NMF must also be subject to the relevant environmental awareness.

The Operations Manager shall keep records of all environmental training sessions, including names of attendees, dates of their attendance and the information presented to them.

5.2 Environmental Policy

Namwaste will operate the site in terms of a Safety, Health, Environmental and Quality (SHEQ) Policy and is committed to meeting the objectives which will be set out in the policy. The core environmental objectives of the SHEQ Policy will be:

To minimise impact on the environment (including social) wherever possible.

- To comply with all applicable environmental legislation and the commitments contained in the EMP.
- To ensure that all employees, contractors and sub-contractors:
    - Are aware of the impact of their activities on the environment;
    - Are informed about the measures required to prevent, mitigate and manage
    - environmental impacts; and

    - Apply these principles whilst carrying out their work.
- To establish and maintain a good relationship with stakeholders and other interested and affected parties (I&APs) about the activities on site.

5.3 Steps to achieve the environmental policy objectives

SHEQ Policies are realised by setting specific and measurable objectives. The objectives are revised throughout the life of any project. General objectives are as follows:

- Management of environmental responsibilities:
    - Appoint a Compliance Officer/Manager, who must be provided with the necessary resources, to assist the Operations Manager in carrying out the management of all environmental aspects of the NMF, for example:
        - compliance with environmental legislation, ECC and EMP commitments;
        - implementing and maintaining an environmental management system;
        - developing an EPRP, inclusive of responses to environmental incidents and coordinating personnel during incidents;
        - managing routine environmental monitoring and data interpretation;
        - environmental trouble shooting and implementation of remediation strategies;
        - closure planning (when required).
- Communication of environmental issues and information:
    - Carry out meetings, consultations and progress reviews, which is to include:
        - provide progress reports on the achievement of policy objectives and level of compliance with the approved EMP;
        - ensure environmental issues are raised in relevant meetings at all levels;
        - ensure environmental issues are discussed at all general liaison meetings with local communities and other interested and affected parties.
- Environmental awareness and training:
    - Provide environmental awareness and training to all individuals at a level of detail specific to the requirements of their job or risk exposure, e.g.:
        - Basic SHEQ awareness training for all visitors prior to granting access to site.
        - General environmental awareness training to all employees and contractors as part of the SHEQ induction. All non-Namwaste personnel who will be on site for more than two days must undergo the SHEQ induction training.
        - Specific environmental awareness training to personnel whose work activities can have a significant impact on the environment.
        - Review and update the environmental topics identified in the EMP.
        - Provide input to design of all projects to minimise impact on the environment.
        - Maintain records of all environmental training, monitoring, incidents, corrective actions and reports.

5.4 Training objectives of the environmental awareness plan

The environmental awareness plan must communicate the following:

- The importance of conformance with the environmental policy, procedures and other requirements of good environmental management;
- The significant environmental impacts and risks of individuals' work activities and explain the environmental benefits of improved performance;
- Individuals' roles and responsibilities in achieving the aims and objectives of the environmental policy; and
- The potential consequences of not complying with environmental procedures.

5.5 General contents of the environmental awareness plan

To achieve the stated objectives, the general contents of the environmental awareness plan must include:

- Introduction to Namwaste's Environmental Policy and Duty of Care;
- An introduction to the NMF, its layout and activities together with the environmental setting (e.g. local communities and proximity to natural resources);
- Understanding of the potential environmental impact of NMF activities (e.g. dust generation, contamination of surface water, energy consumption, water use, noise, etc.);
- An introduction to the EMP and its objectives, outcomes and actions;
- An introduction to the specific Namwaste procedures relevant to the NMF;
- Identifying poor environmental management and stopping work which presents significant risks;
- Reporting of environmental incidents; and
- Procedures for incident response.

The content of the environmental awareness plan must be at a level of detail relevant to the environmental risk and requirements of the job, which the employee is undertaking.

6.0 Environmental Monitoring and Reporting

To assess the implementation and effectiveness of the impact management actions at the NMF it is necessary to undertake monitoring of particular operations and environmental parameters. The purpose of monitoring programmes is to report on any changes that occur to the various environmental aspects, to review the NMF's impact on these environmental aspects and to recommend changes that may be required to operations and management actions implemented at the NMF.

6.1 Functional requirements of Monitoring Programmes

Namwaste (Pty) Ltd must ensure that all monitoring programmes comprise the following:

- a formal procedure;
- use of appropriately calibrated equipment;
- the date, time and monitoring point of each sample is to be recorded;
- where samples require analysis, these must be preserved according to laboratory specifications;
- accredited laboratories must be used to undertake sample analyses and/or internal laboratory results must periodically be checked by independent and accredited laboratories;
- analysis, where relevant, must be carried out in accordance with methods prescribed by the Nambian or South African National Standards, or similar;
- monitoring points and parameters to be monitored must be identified in consultation with a specialist in the field and/or the relevant authority;
- chemical constituent concentrations must be compared against water quality standards as per the WRMA, a South African equivalent, or the WHO standards;
- if necessary, following the initial monitoring results, certain parameters may be removed from the monitoring programme in consultation with a specialist and/or the relevant authority;
- monitoring data must be stored in an appropriate database;
- data must be interpreted and reports on trends in the data must be compiled on a regular basis; and
- both the data and the reports must be kept on record for the duration of operations.

6.2 Monitoring Programme

The monitoring programmes for the NMF and the details thereof are specified in Table 6-1.

Table 6-1: Programme for Monitoring at the NMF

Aspect	Parameter	Frequency	Reference
Climatic data	Weather (temperature, humidity, rainfall, evaporation, wind speed and direction)	Daily	Hydrology, Geohydrology and AQIA studies
NMF liquids	Volume of liquids in and available freeboard at PCD(s) and	Monthly (Liquid Management Model)	Hydrology and Geohydrology studies

Aspect	Parameter	Frequency	Reference
	stormwater dam(s) for each phase. Chemical composition (inorganic and organic) of liquids in underdrainage system, leachate collection points, PCD(s) and stormwater dam(s) for each phase.	Quarterly – Independent contractor	
Groundwater Quality	Water quality standards as per the WRMA, in the Monitoring Borehole Network	Monthly for any Potable water borehole (s). Quarterly for others – Independent contractor	Appendix B
Groundwater Resource	Abstraction volume Groundwater levels in the Monitoring Borehole Network	Monthly abstraction volume. Quarterly water levels – Independent contractor	Appendix B
Surface water Quality	Water quality standards as per the WRMA, at the upstream and downstream locations	Monthly during wet season and after storm events	Appendix C
Stormwater Management Infrastructure	Functionality, stability, erosion etc	Monthly during wet season and after storm events	None
Air Quality/Human Health	Dust Fallout BTEX/H_2S Fine Particulate	Monthly Quarterly Fortnightly (for 1st year)	Appendix C

6.3 Review and Revision

Monitoring commitments, monitoring networks and related monitoring protocols must be reviewed and revised by Namwaste to ensure that they are appropriate to the layout, activities and risk at the NMF. Updates to the monitoring networks or monitoring protocols must be initiated where circumstances (e.g. extension of the site or addition or suspension of activities) dictate and upon recommendation by the specialist consultant or directive from MEFT.

6.4 Monitoring Records

Records must be kept of all monitoring events and audits undertaken in terms of the EMP. Such records must be kept for at least 5 years and must be easily retrievable.

6.5 Compliance Monitoring and Reporting

Auditing is the most effective tool to measure whether the status of operations is maintained and whether compliance with the impact management actions is being achieved. Auditing requires a systematic review of compliance to:

- ECC conditions;
- EMP; and

- Relevant applicable environmental legislation.

The audit process must include:

- A review of documentation;
- The compilation of an audit checklist;
- Physical site inspection;
- Interviewing of relevant parties;
- Consideration of progress on previous non-conformances, if any; and
- The formulation of findings and recommendations.

The process must result in an audit report which must include:

- The audit checklist;
- A report on the findings;
- A record of performance;
- A comparison to standards and past performance; and
- Recommendations for corrective actions.

6.5.1 Internal Audits

The Compliance Officer/ Manager/SHEQ Manager must undertake regular audits (monthly during the construction phase and quarterly during the operational phase) on compliance with the EMP. The audit findings must be documented for both record keeping purposes and for informing continual improvement. The findings must be presented to the Operations Manager.

6.5.2 External Audits

An independent, third-party professional with relevant knowledge and experience must undertake annual audits to monitor and report on compliance with the EMP. The audit must also assess the appropriateness of the EMP relative to the on-site activities. The audit findings must be documented for both record-keeping purposes and for informing continual improvement. Amendments and refinement to this EMP must be made during this annual review process in line with the requirements of the legislation applicable at the time. The findings must be presented to the Operations Manager and MEFT.

6.5.3 Record Keeping

The Compliance Officer/Manager/SHEQ Officer must provide routine feedback to the Operations Manager and ECC Holder management regarding:

- Results of routine monitoring, highlighting any significant issues;
- Compliance with relevant permits and/or licences;
- Results of internal audits to determine compliance to the EMP commitments;
- Complaints and grievances; and
- Incidents and corrective action implemented.

The following documentation must be kept on site, as detailed in order to record compliance with the EMP and must be made available to an Independent Environmental Auditor prior to an audit:

- Copy of the EMP and all appendices;

- Copy of the ECC, once issued;
- Copy of all other licences/ permits;
- Copy of relevant legislation;
- Environmental Policy of all contractors;
- Environmental Method Statements compiled by all contractors;
- Written Warning Notifications;
- Environmental Register, which must include:
    - Complaints Register - including records of complaints, and, minutes and attendance registers of all environmental meetings; and
    - Incident Register - including copies of notification of emergencies and incidents, this must be accompanied by a photographic record.
- Waste Documentation such as, but not necessarily limited to:
    - Technical Services Acceptance Sheet (TSAS);
    - Weighbridge Receipts (for general waste);
    - Disposal Certificates (for hazardous waste); and
    - Material Safety Data Sheets (MSDSs) for all hazardous substances.
- The Compliance Officer/Manager/SHEQ Officer must provide routine feedback to the Operations Manager regarding:
    - Results of routine monitoring, highlighting any significant issues;
    - Compliance with relevant permits and/or licences;
    - Results of internal audits to determine compliance to the EMP commitments; and
    - Incidents and corrective action implemented.

6.5.4 Document Register

A document register must be prepared and maintained by Namwaste and all contractors for all construction projects. The following documentation must be included in the Document Register and filed in a Site Environmental File to be kept on site:

- Copy of the signed EMP and Appendices;
- Copy of the ECC (once obtained);
- Copy of all relevant permits, licences and authorisations (once obtained);
- Copy of Namwaste’s ESMS, Policies and Plans;
- Copy of Contractor’s E&S Policies;
- Copy of Documents to be prepared (including method statements);
- Complaints Register;
- Incidents Register;
- Permit Register;
- Legal Register;
- Completed Inspection Checklist;

- Monthly E&S Report;
- Completed Audit Checklist;
- Waste Documentation relevant to the construction project such as, but not limited to: Waste Manifest Documents, Disposal Certificates, etc.;
- Water abstraction records;
- MSDSs for all hazardous substances;
- Dust suppression register;
- PPE register; and/or
- Other monitoring reports.

6.5.5 Permit Register

A permit register must be developed and maintained by the Compliance Officer/Manager/SHEQ Officer for the duration of the NMF

6.5.6 Non-Compliance and Corrective Action

Any non-compliances or emergency incidents must be reported on as follows:

- The root cause of the non-compliance must be identified and all of the relevant corrective actions assigned to individuals and completed before the non-compliance can be closed out.
- Non-compliances must be reviewed quarterly to ensure that they are closed out.

7.0 Dealing with Risks to avoid Pollution or Degradation

7.1 On-going Monitoring and Management Measures

The facilities at the NMF must be subject to continual observation, scheduled maintenance and repairs, as and when required, to ensure that all facilities operate in compliance with the principles of environmental and social management and the EMP in particular.

The monitoring programmes as described in Section 6 must be undertaken to provide early warning systems necessary to avoid environmental emergencies. The NMF must be subject to compliance auditing per the conditions of the ECC and section 6.5 of this EMP, with both internal and external (independent third-party) audits being undertaken.

7.2 Procedures in case of Environmental Emergencies

Environmental incidents include the “unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property”. The events may lead to serious danger to employees, public, equipment and/or potentially serious pollution of, or detriment to the environment (immediate and delayed).

Namwaste will have an EPRP for the NMF. The plan will be developed to ensure that the facility is capable of coping immediately and effectively with incidents and emergency situations in order to minimise the detrimental impact on people, the community and the environment. The plan will include measures to address the following:

- Plant or equipment malfunction;
- Site fires or adverse chemical reactions;
- Spillages (on Site); and
- Natural disasters such as floods.

The EPRP will set out the arrangements for responding to incidents or emergency events that may threaten people, assets, the community or the environment. The plan must include contact details of the nearest police station, ambulance services and the emergency centre. The general procedure that should be followed in the event of all incidents or emergency situations is as follows:

- Undertake steps to limit/contain the impact of the incident or emergency;
- Inform relevant authorities;
- Implement the relevant section of the EPRP;
- Area to be cordoned off to prevent unauthorized access and tampering of evidence;
- If controls are partially or totally failing and this cannot be prevented, the emergency siren is to be sounded (nearest one available); and
- Take photographs and samples as necessary to assist in any investigation.

Record of Report Distribution

SLR Reference:	733.V09045.00008
Title:	Namwaste Management Facility
Report Number:	01
Client:	Namwaste (Pty) Ltd

Name	Entity	Copy No.	Date Issued	Issuer
Librarian	Arandis Library	01	9 August 2024	S.Strauss
EC	MEFT	02		S.Strauss

Appendix A Environmental Assessment Practitioner CVs

Namwaste Management Facility

Final Environmental Management Plan

Namwaste (Pty) Ltd

SLR Project No.: 720.09045.0008

9 September 2024

Appendix B Groundwater Monitoring Plan

Namwaste Management Facility

Final Environmental Management Plan

Namwaste (Pty) Ltd

SLR Project No.: 720.09045.0008

9 September 2024

8.0 Groundwater Monitoring Plan

A groundwater monitoring network and plan was developed for the Project site in 2023 (SLR, 2023) as part of the hydrogeological screening assessment (Figure 8-1). The network was aimed at establishing the groundwater baseline for the area. As such, eight boreholes were installed and have been monitored for groundwater levels and quality.

Considering the determination of the NMF footprint, the Concept Design, the numerical modelling results and impact assessment outcomes, an update of the groundwater monitoring network is proposed. The groundwater monitoring plan is based on the information presently known and subject to change as the NMF evolves.

Currently, two business cases are proposed, in one case the facility will deposit both arsenic and other hazardous waste and, in another case, only other hazardous waste. Therefore, updated to the monitoring plan assumes that both arsenic and other hazardous waste will be deposited.

8.1 Groundwater Monitoring Network

8.1.1 Source, Plume, Impact and background monitoring

Modelling results indicated that the expected plume (should there be seepage), would not reach most of the existing downgradient boreholes. It is therefore recommended that a further twelve boreholes are drilled around the facility footprint, which will account for upgradient and downgradient boreholes, as the monitoring network should allow for evaluation at the potential source (i.e., below the NMF), plume areas and background monitoring positions. Once additional boreholes are drilled closer to the facility footprint, monitoring frequency of some of the existing boreholes should be revised and form part of regional monitoring. Some of the boreholes should be established within the shallow alluvial aquifer.

8.1.2 System response monitoring network

The additional boreholes proposed in Figure 8-2 only provide an indication of the positions. Prior to drilling, a geophysical survey should be carried out to define exact positions and co-ordinates. This should be done as soon as site clearance commences, and access for the drill rig can be established. All new boreholes should also be pump tested to gather further information on the aquifer characteristics. It is essential that each borehole is fully secured in terms of sturdy headworks, i.e., installing precast concrete rings around the boreholes, adding permanent labels to the borehole, placing a lock on the openings, etc.

Rest water levels closer to the site should be used in the numerical groundwater model update when needed.

As previously mentioned, borehole WW206579 should be appropriately decommissioned and sealed prior to construction on site. Site staff involved with excavation and associated activities should be made aware of the decommissioned borehole.

8.1.3 Monitoring frequency

Groundwater monitoring should take place quarterly. Where possible, groundwater monitoring should take place concurrently with surface water monitoring. This includes field measurements in the form of:

- Water levels with a dip meter;
- Field measurements with a handheld meter to obtain pH, electrical conductivity (EC), total dissolved solids (TDS) and temperature (°C); and
- Water sampling with the use of a submersible pump for purging boreholes.

Monitoring should be undertaken by suitably qualified individuals that are able to calibrate equipment, understand how to prevent cross contamination of samples between boreholes, etc. The procedures followed in obtaining the field data should follow industry best-practice standards, in the absence of local regulations. Reporting should take place quarterly to ensure that if any issues are detected, this is raised timeously with relevant information provided.

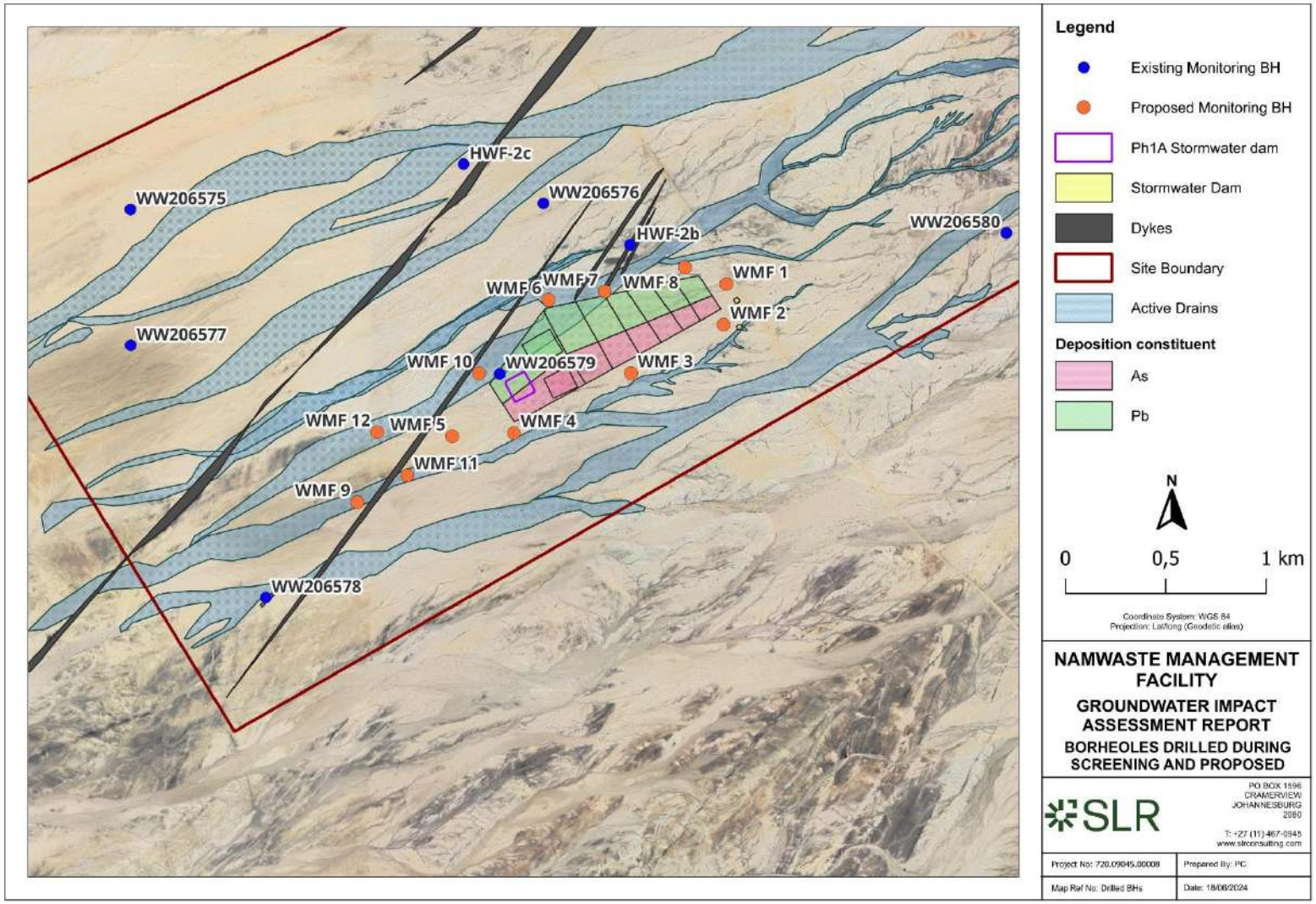


Figure 8-1: Boreholes drilled during hydrogeological screening (blue) and proposed additional boreholes (orange)

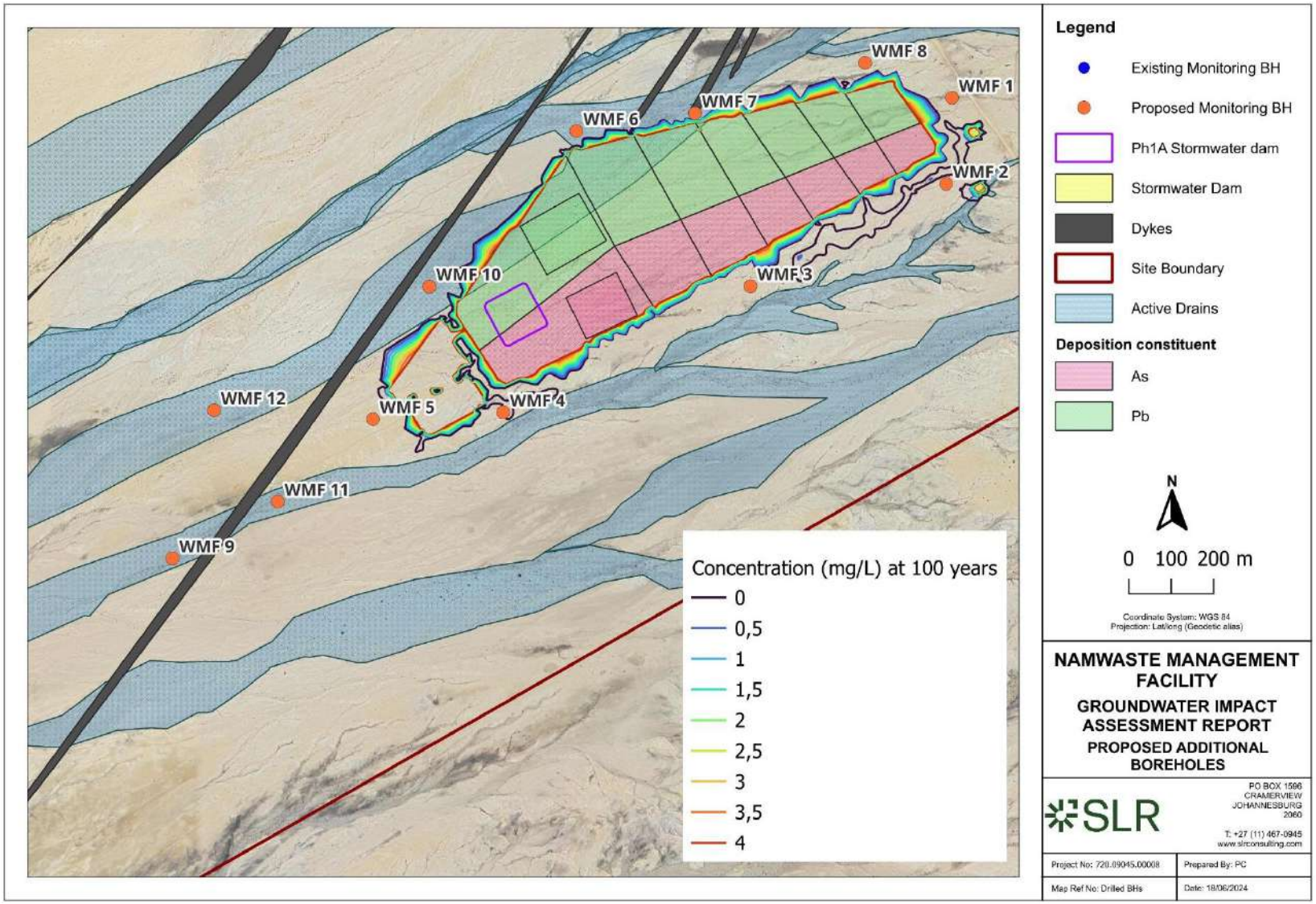


Figure 8-2: Proposed new boreholes to be added to groundwater monitoring network (orange)

8.2 Monitoring Parameters

The water levels of boreholes should be measured, along with the collar height.

The chemical parameters to be analysed should be guided by the water quality standards as per the Water Resources Management Act, No. 11 of 2013 (WRMA) and its water quality standards for effluent discharge, as highlighted in Section 2.2 of the conceptual groundwater model report (SLR, 2024b).

Therefore, general considerations include but are not limited to the constituents in Table 8-1. Radionuclides should be tested annually.

Data should also be compared to Word Health Organization (WHO, 2017) guidelines for drinking water quality for global context.

Table 8-1: Chemical constituents for groundwater monitoring

Total Metals	Unit	Major Ions	Unit	Radionuclides	Unit
Aluminium	µg/l	pH		^{234}U Uranium	Bq/l
Antimony	µg/l	Electrical Conductivity	mS/m	^{235}U Uranium	Bq/l
Arsenic	µg/l	Turbidity	NTU	^{238}U Uranium	Bq/l
Barium	µg/l	Total Dissolved Solids (calc.)	mg/l	^{230}Th Thorium	Bq/l
Beryllium	µg/l	P-Alkalinity as $CaCO_3$	mg/l	^{232}Th Thorium	Bq/l
Bismuth	µg/l	Total Alkalinity as $CaCO_3$	mg/l	^{226}Ra Radium	Bq/l
Cadmium	µg/l	Total Hardness as $CaCO_3$	mg/l	^{228}Ra Radium	Bq/l
Caesium	µg/l	Ca-Hardness as $CaCO_3$	mg/l	^{210}Pb Lead	Bq/l
Chromium	µg/l	Mg-Hardness as $CaCO_3$	mg/l	^{210}Po Polonium	Bq/l
Cobalt	µg/l	Chloride as Cl	mg/l		
Copper	µg/l	Fluoride as F	mg/l		
Iron	µg/l	Sulphate as SO_4	mg/l		
Lead	µg/l	Nitrate as N	mg/l		
Lithium	µg/l	Nitrite as N	mg/l		
Manganese	µg/l	Sodium as Na	mg/l		
Mercury	µg/l	Potassium as K	mg/l		
Molybdenum	µg/l	Magnesium as Mg	mg/l		
Nickel	µg/l	Calcium as Ca	mg/l		
Niobium	µg/l	Sulphide as S_2-	mg/l		
Rubidium	µg/l	Stability pH, at 25°C			
Selenium	µg/l	Langelier Index			
Silver	µg/l	Ryznar Index			
Titanium	µg/l	Corrosivity ratio			
Tungsten	µg/l				
Tellurium	µg/l				
Thallium	µg/l				
Thorium	µg/l				
Tin	µg/l				
Uranium	µg/l				
Vanadium	µg/l				
Zinc	µg/l				

8.3 Data control

Data should be captured in a reliable database that can be accessed by relevant personnel. The sampling dates, quarters, photographs and information should be displayed in a convenient format that translates to graphs, chemistry diagrams, etc. This will help ensure that information is not lost, and a proper record is kept as time series data is built during operation.

The database should include baseline data and data during operations, as well as closure (as necessary). Consistent time series data will provide a clear picture on the groundwater system and aid in periodic reporting.

Appendix C Surface Water Monitoring Plan

Namwaste Management Facility

Final Environmental Management Plan

Namwaste (Pty) Ltd

SLR Project No.: 720.09045.0008

9 September 2024

9.0 Surface Water Quality Monitoring

As the best practice, monitoring of surface water quality should be undertaken monthly during wet seasons and after storm events or as per the site management schedule, where it is available. Monitoring should be undertaken within each catchment intersecting the NMF, at locations upstream and downstream of the site and the positions of proposed monitoring points are provided in Table 9-1 and Figure 9-1.

Table 9-1: Co-ordinates of proposed monitoring points

Water Quality Monitoring Points	Co-ordinates	
Sampling Points	Latitude	Longitude
SP1	22°15'21.51"S	14°56'3.26"E
SP2	22°15'52.57"S	14°56'44.24"E
SP3	22°17'26.62"S	14°51'21.48"E
SP4	22°18'5.74"S	14°51'55.57"E

Table 9-2 shows recommended minimum water quality parameters to be monitored. Monitoring the parameters listed below are regarded as best practice, more parameters may be added as and when needed. Monitoring should continue for the duration of the operation of the NMF, and likely after closure.

It is recommended that a detailed monitoring plan be developed outlining what needs to be monitored, monitoring locations, frequency of monitoring and the reporting requirements.

Table 9-2: Minimum Surface Water Parameters to be Monitored

Parameters	Parameters
pH	Nitrate as N
Electrical conductivity	Ammonia
Total dissolved solids	Potassium
Total suspended solids	Nickel
Aluminium	Manganese
Calcium	Magnesium
Fluoride as F	Iron
Total alkalinity as $CaCO_3$	Copper
Chloride as Cl	Lead
Sulphate as SO_4	Sodium
Uranium	

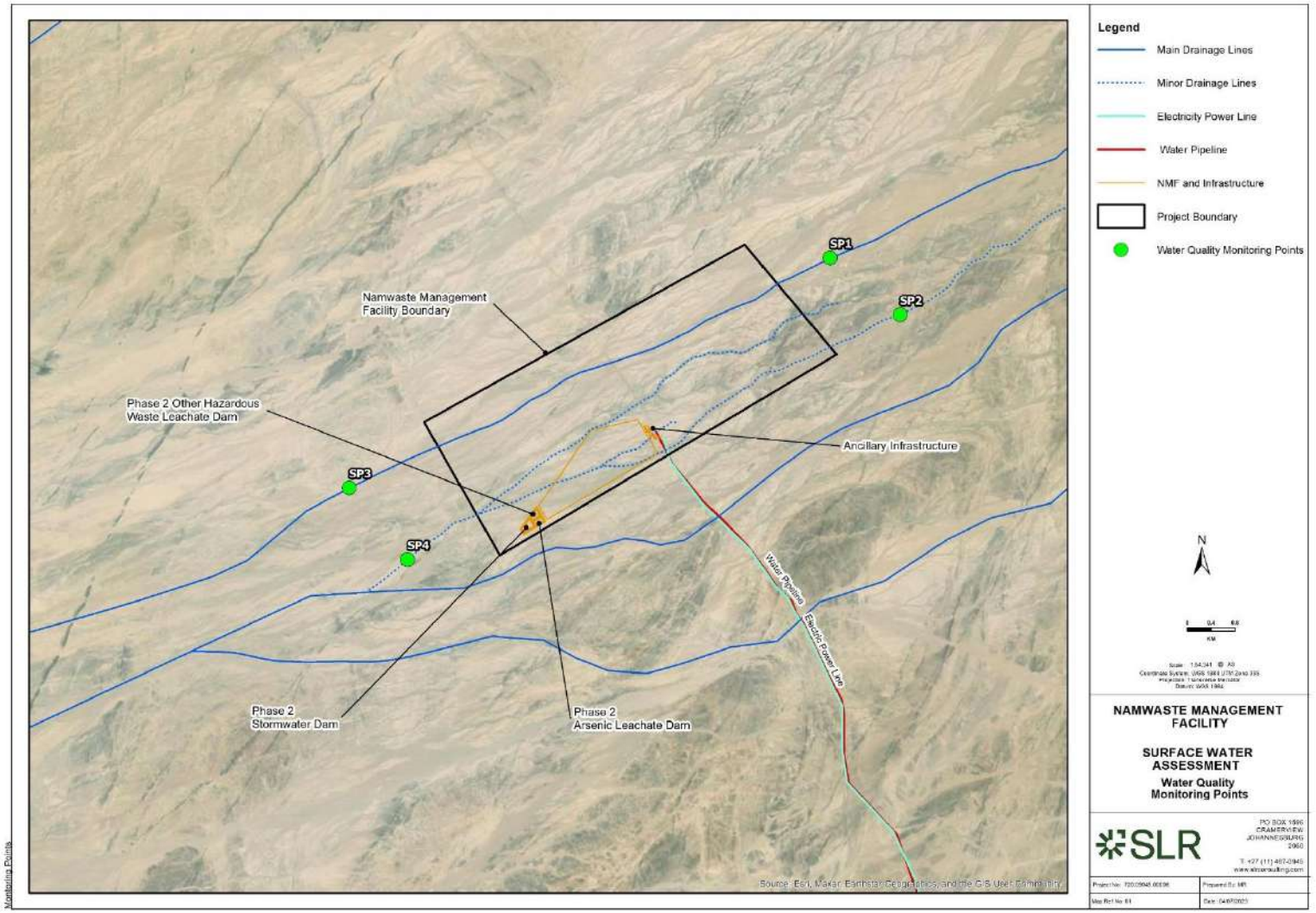


Figure 9-1: Map of the proposed water quality monitoring points

Appendix D Air Quality Monitoring Plan

Namwaste Management Facility

Final Environmental Management Plan

Namwaste (Pty) Ltd

SLR Project No.: 720.09045.0008

9 September 2024

10.0 Air Quality Monitoring

- Maintain a fenceline DFO monitoring network for ongoing assessment of fugitive dust impacts in accordance with South African NDCR as a guideline. Should non-compliances be recorded, a detailed dust management plan must be drafted to establish and manage emission reduction strategies.
- Undertake passive monitoring of BTEX and H2S along the facility's fenceline and at the closest sensitive receptors (e.g. closest household in Arandis). Periodic (e.g. quarterly) monitoring campaigns are recommended. Should measurements be persistently below guidelines, the frequency of monitoring could decrease. However, it must be kept in mind that the quantity of waste received is expected to increase year on year. As such, monitoring should not occur less frequently than annually, with a focus on the warmest season.
- A fine particulate screening survey to measure PM10 and PM2.5 at two locations (e.g. at the NMF site office and at a proximate sensitive receptor such as SR5 – Arandis Primary) is recommended to verify simulated offsite impacts.
- It is recommended that repeat monitoring campaigns use the same sampling locations for comparing results and tracking trends over time. Should results indicate negligible to very low impact, monitoring requirements and the frequency thereof can be revised (e.g. reduced monitoring network, or biannual measurement, etc).
- The installation of an onsite weather station will provide site specific meteorological data that can assist with the interpretation of monitoring results and source identification for investigating air quality complaints.

Appendix E Chance Find Procedure

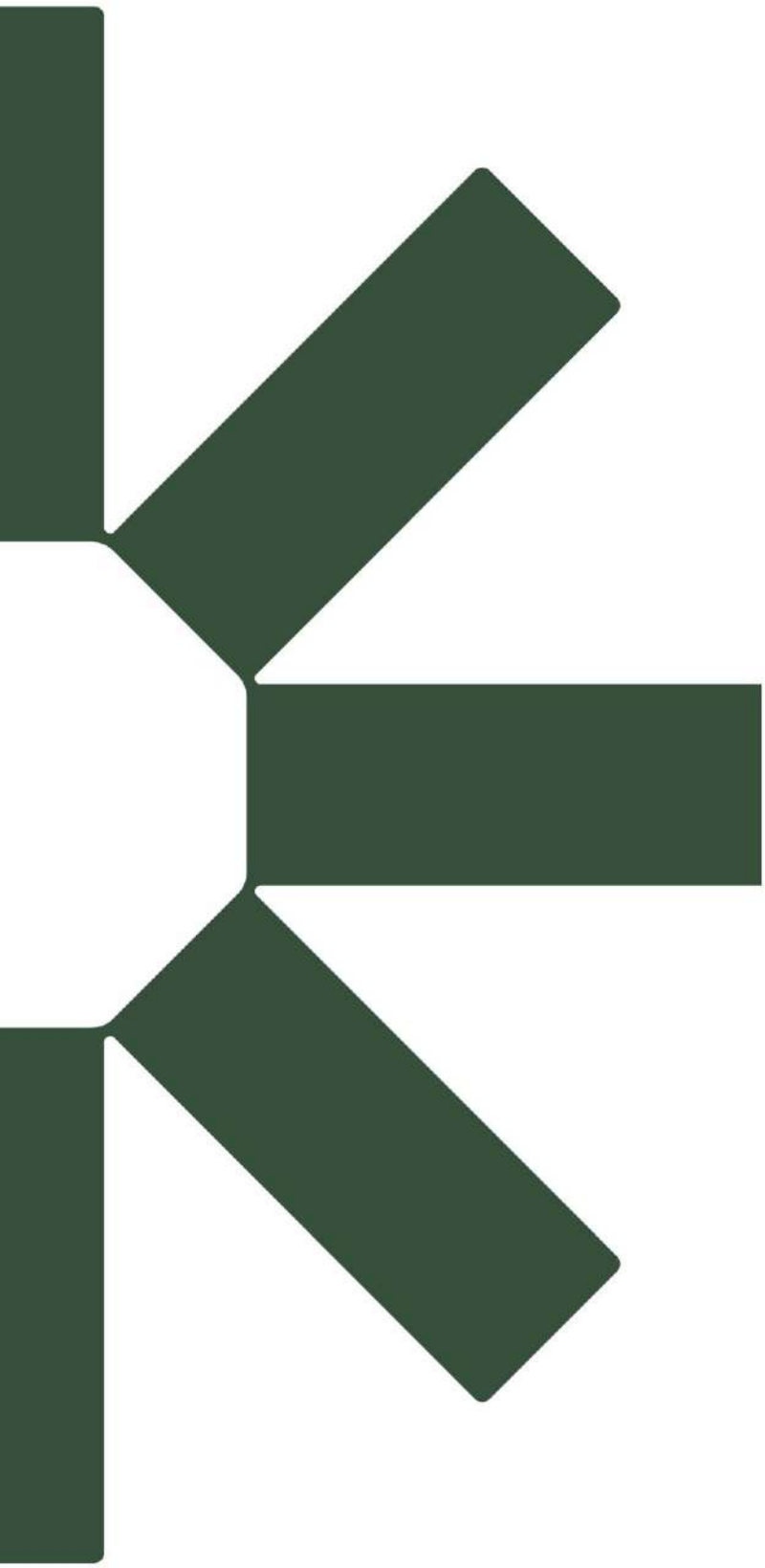
Namwaste Management Facility

Final Environmental Management Plan

Namwaste (Pty) Ltd

SLR Project No.: 720.09045.0008

9 September 2024



Making Sustainability Happen