# Namwaste Management Facility

## Final Scoping Report

### Namwaste (Pty) Ltd

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Prepared by:

**SLR Environmental Consulting (Namibia) (Proprietary) Limited**

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# Executive Summary

## 1.0 Introduction

This Executive Summary provides a synopsis of the Final Scoping Report (SR) prepared as part of the Environmental and Social Impact Assessment (ESIA) process that is being undertaken for an application for the proposed development of the Namwaste Management Facility (NMF) near Arandis in the Erongo Region (See Figure 1).

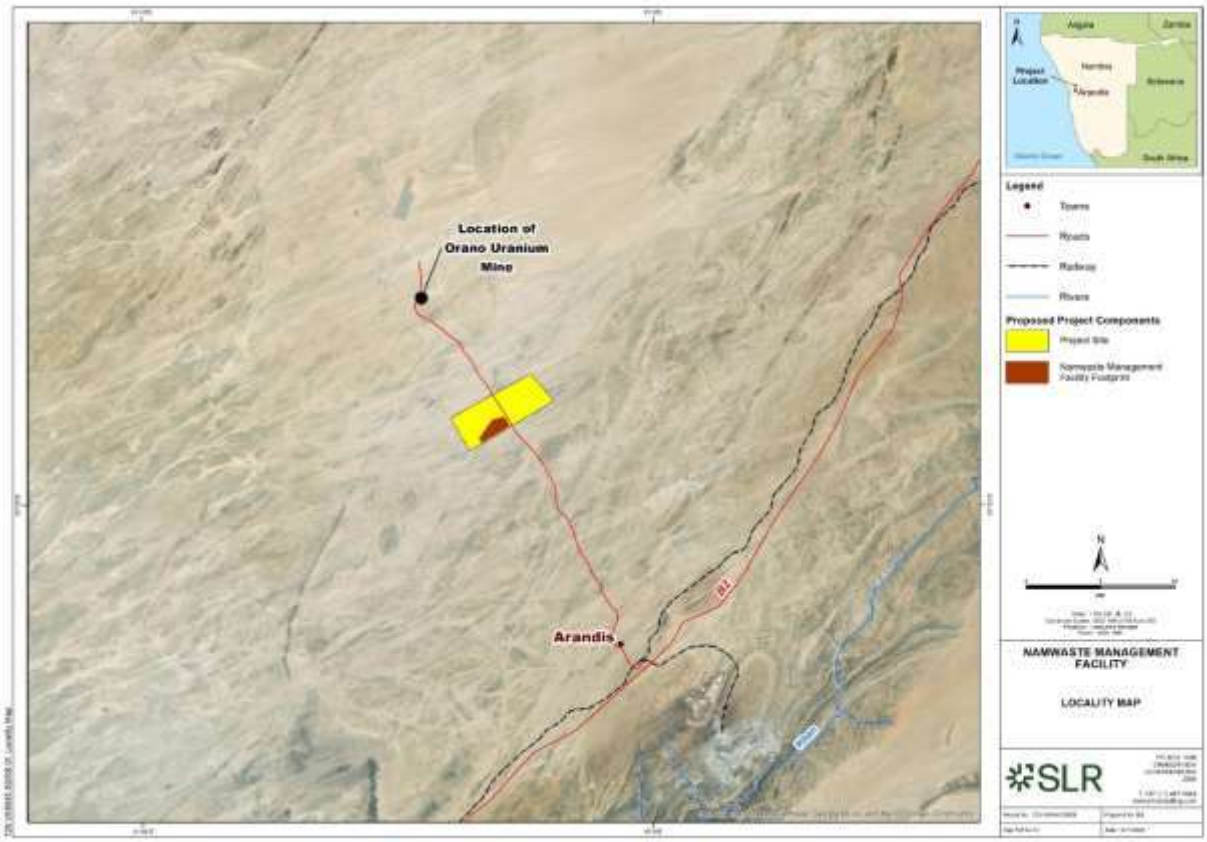


**Figure 1: Locality of Project site**

## 1.1 Project Background and Location

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

The Séché Environnement Group, an established French-owned company, operates in 15 countries throughout the world and is a major player in the circular economy and waste management, decontamination and emergency environmental services sector. 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. 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.

SLR Environmental Consulting (Namibia) (Pty) Ltd has been appointed by Namwaste as the Independent Environmental Assessment Practitioner to undertake a full Scoping and Environmental Impact Assessment (EIA) process for the proposed NMF Project.

## 1.2 Opportunity to Comment

The draft Scoping Report was distributed for a 30-day comment period from **15 November 2023 to 15 December 2023** and Interested & Affected Parties (I&APs) were provided with opportunity to comment on any aspect of the proposed project and the findings of the EIA process to date. Copies of the full report were available on the SLR website (at https://www.slrconsulting.com/public-documents/namwaste-nmf/) and at the following location:

| Name of Facility |
|---|
| Arandis Community Library, Arandis |

Comments received by SLR at the address, telephone/fax numbers or e-mail address shown below **on or before 15 December 2023** have been included in this Final Scoping Report.

**SLR Environmental Consulting (Namibia) (Pty) Ltd**

**Attention:** Stephanie Strauss

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Details of the public participation process (PPP) undertaken to date are provided in Chapter 3.0 of this SR.

# 2.0 EIA Process

The EIA process is an interdisciplinary and multi-step procedure to ensure that environmental considerations are included in decisions regarding projects that may impact the environment (See Figure 2). The EIA for the NMF project is currently in the Scoping Phase.

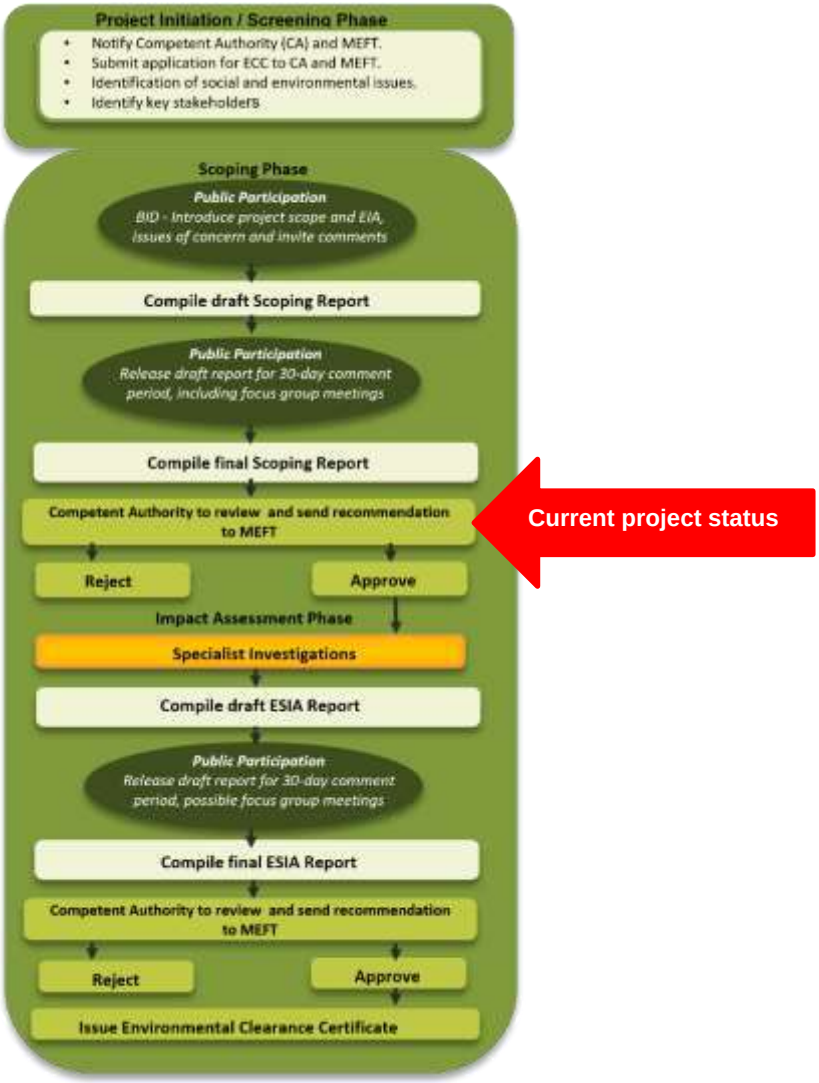


**Figure 2: Illustration of the EIA process**

The EIA process includes project initiation / screening & application, scoping and impact assessment phases, as well as the compilation of an Environmental Management Plan (EMP) to ensure that the potential environmental and social impacts are avoided / minimized, during the life of a project.

The EIA regulatory process aims to:

- Notify I&APs about the proposed NMF Project and EIA process and provide reasonable opportunity for involvement;
- Provide information on the project and its alternatives;
- Document the baseline environment that may be affected;
- Identify environmental and social aspects, in consultation with I&APs, and assess the potential impacts of the proposed project and its alternatives;
- Present appropriate management and mitigation or optimisation measures to avoid or minimise potential negative impacts or enhance potential benefits, respectively; and
- Allow for informed, transparent and accountable decision-making by the relevant authorities.

# 3.0 Project Need and Desirability

Waste disposal is one of the major concerns within the solid waste management system in Namibia (MEFT, 2017). Currently Namibia 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. Therefore, improved hazardous waste management is urgently needed in Namibia to accomplish the implementation of feasible options for hazardous waste management as one of the objectives outlined in the National Solid Waste Management Strategy (MEFT, 2017). In addition, 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 in Namibia 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.

The proposed NMF would service the mining, oil and gas, and other industrial and business sectors. The facility would be open to accept waste from anywhere in Namibia, provided transportation over long distances is feasible to the client. The majority of the waste which would be treated and/or disposed at the facility will be hazardous, but general waste would also be accepted. The NMF would offer the opportunity for disposal of general waste from surrounding communities, such as the nearby town of Arandis.

The development and operation of the proposed NMF would generate approximately 20-25 permanent employment opportunities on average, comprising of both skilled and unskilled jobs. The local communities would be given due consideration related to employment opportunities. In addition, training and skills development would be offered to employees.

The Namibian Vision 2030 policy aims to develop wealth and prosperity among the population while taking cognisance of the importance of protecting biodiversity in this process (Namibia Vision 2030, 2004). This aligns with the Séché Group's approach to the preservation of biodiversity, which has been one of the Group's core values since its inception over 40 years ago. A dedicated team of ecologists drive sustainable development by linking the landscape, biodiversity and environment into all activities of the Group. The development of this approach has evolved over time and Séché is now implementing biodiversity preservation and restoration programmes across operations internationally in alignment to its voluntary commitments to Act4Nature.

Accordingly, Namwaste would implement programmes to restore, preserve and enhance biodiversity around the proposed NMF, in consultation with the local community and the #Gaingu Conservancy. Biodiversity preservation and restoration would be incorporated into the design and ongoing development and management of the NMF.

# 4.0 Project Description

## 4.1 Overview of the Proposed Project Activities

The main project components are detailed in Table 1 below. The project components are detailed in Chapter 5.0 of the SR.

Namwaste identified a potentially suitable site for the development of the NMF following a screening study (Environmental Compliance Consultancy, 2022) and a Technical Feasibility Study (SLR, 2023). The site is located ~15 km north-west of Arandis, along the Trekkopje Road (Orano Uranium Mine access road) in the Erongo Region. The site is approximately 1 500 ha in extent, within which Namwaste selected a proposed footprint of approximately 177 hectares for development of the NMF.

**Table 1: Summary of Project Components**

| Project Component | Details |
|---|---|
| **Waste Treatment Facility** | ○ 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);<br>○ Landfill leachate collection and containment in suitable facilities;<br>○ 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;<br>○ Warehouse with a concrete slab for off-loading of arsenic waste in bulk bags;<br>○ Workshop;<br>○ Office block;<br>○ Parking area;<br>○ Staff dining and ablution facilities;<br>○ Package sewage plant (all sewage generated on the site will be treated on site); and<br>○ Air quality monitoring station (if required). |
| **Stormwater Management Infrastructure** | ○ Stormwater/ run-off management infrastructure for collection and containment of any contaminated water in dams;<br>○ V-drain around the upstream side of the site to divert clean stormwater off site; |
| **Access Infrastructure** | ○ Access road (~8 m wide) from the entrance of the industrial area of Arandis to Trekkopje Road (~3.3 km) or from the proposed alternative access off the B2 to the Trekkopje Road (4.8 km) to allow trucks to bypass the town of Arandis;<br>○ Access control facilities including perimeter fencing;<br>○ Weighbridges and control room;<br>○ Internal roads;<br>○ 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; |
| **Water Infrastructure** | ○ Bulk water supply pipeline to convey water to the site from the Orano desalination plant. The pipeline will extend from the existing pipeline at the Orano Uranium Mine to the site (approximately 20 km). Daily water consumption is estimated to be 150 $m^3$ per day;<br>○ Water pump station at the Orano Uranium Mine and on-site water storage at NMF (2 x 30 $m^3$ JOJO type tanks);<br>○ Boreholes for abstraction of water (50 $m^3$ per day);<br>○ Borehole water monitoring network; |
| **Electrical Infrastructure** | ○ Electrical supply (estimated 350 kVA) and substation connected to nearest supply in Arandis (approximately 15 km); |

An indicative layout of the NMF has been developed (see Figure 3), which will be iterated based on consideration of environmental and social aspects gathered through the EIA process.

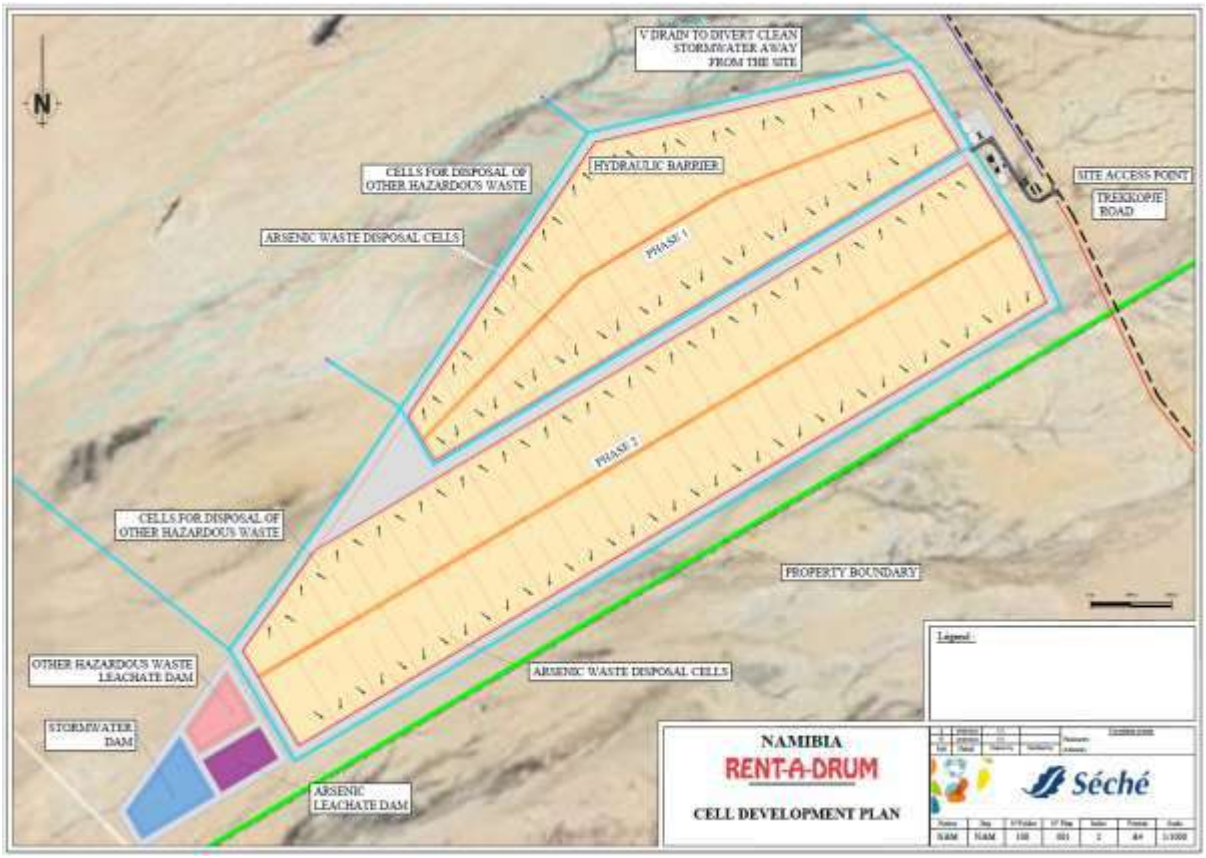


**Figure 3: Indicative layout of the NMF**

# 5.0 Description of the Receiving Environment

This section provides a brief description of the attributes of the receiving environment of the Project site. The receiving environment is discussed in detail in Chapter 6.0 of the SR.

| Receptor/variable | Description |
|---|---|
| Climate | • Project site located in the Namib Desert.<br>• Low annual rainfall (approximately 50 mm) and annual fog deposition of approximately 10 mm.<br>• High solar radiation, low humidity, and high temperature lead to very high evaporation rates.<br>• The dominant winds are SSW and NNE, the latter occasionally reaching storm speeds during winter (warm east winds, or Bergwind).<br>• The range of temperatures are wide, with average maximums exceeding 34°C (December) and average minimums being under 5°C (July). |
| Topography | • Relatively gently rolling terrain, sloping (gently) from approximately 580 m above sea level at the north-eastern boundary, down to approximately 490 m at the south-western boundary.<br>• Plains and various shallow washes and low ridges characterise the target area. |

| Receptor/variable | Description |
|---|---|
| | • Quartz gravel covers most of the plains, and sand dominates in washes.<br>• A few relatively small outcrops were found across the Project site.<br>• Various ephemeral washes (draining lines) traverse the proposed Project footprint in an east to west alignment and drain toward the coast. |
| Geology | • Project footprint is located within the Southern Central Zone of the Damara Orogeny where, on a regional perspective, Swakop Group lithologies are mostly predominant. |
| Soils | • Soils that form in the Namib Desert are predominantly mineral soils.<br>• The soils that occur on the desert plains are sensitive to wind and water erosion and have a significantly shallower rooting depth (on average) than alluvial soils. |
| Land use | • Conservation - under control of the #Gaingu Conservancy.<br>• No ML over the project site.<br>• EPL application by Chaneni Investment (Pty) Ltd, pending ECC. |
| Hydrology & Hydrogeology | • Project site falls outside the Swakop-Khan River and Omaruru River Catchments.<br>• Washes and drains, mapped via satellite imagery, are west and a source of recharge to aquifers.<br>• Active flow in the drains was confirmed during the site visit.<br>• Based on geological information, two types of aquifers, primary and fractured, should be classified in the Project site.<br>• Drilling show only a fractured aquifer (mainly from fractures, karsts and contacts) in marble is prevalent in the site.<br>• Groundwater potential is low at the site.<br>• Groundwater quality is expected to be brackish with no potable or commercial use locally.<br>• Regional groundwater flow is directed towards the southwest from mainland Spitzkoppe Mountain area. In this regard, there is no flow towards the strategic river catchments. |
| Biodiversity | • Rocky ridges (which tend to trap moisture from rare rain events and from fog) and drainage lines within the gravel plains, which store water in often extensive sandy aquifers.<br>• The Project site lies within the Biodiversity Yellow flag Area #35 in terms of the SEA for the central Namib Uranium Rush.<br>• The following sensitivities identified in this area: Relatively undisturbed gravel plains, wildlife concentrations (Springbuck, Ostrich). Very large, dense field of Sarcocaulon marlothii (Bushman candle)<br>• Following broad habitats identified for the project site:<br>  ○ Gravel plains<br>  ○ Drainage lines (bigger, active, prominent)<br>  ○ Smaller drainage lines<br>  ○ Rocky/gravelly outcrop areas |
| Archaeology | • Seed diggings and other archaeological sites are likely to be clustered around low granite outcrops. |

| Receptor/variable | Description |
|---|---|
| | • Although the seed diggings are highly abundant, they are not archaeological occupation sites and are not considered particularly significant.<br>• An archaeological assessment of the Trekkopje uranium tenement found that the area is poor in Holocene remains, but that the historical Annaberg tin workings merit protection under the National Heritage Act.<br>• Some of the above-mentioned sites might also be found on the Project site. However, the dolerite dyke cutting through the Project site is much less prominent than others in the region. It could potentially have a lower likelihood of archaeological sites. |
| Air quality | In Namibia air quality generally good.<br>Few industrial sources mainly associated with mining and smelting activities, which are generally remote from populated areas.<br>Socio-economic activities such as minerals exploration and industrial development in Namibia have the potential to promote fugitive dust production. |
| Radiology | • The average annual public radiation exposure dose at the Project site is due to the following individual exposure dose contributions:<br>o Due to the inhalation of radon and its decay products: approx. 0.2 mSv/a, as inferred from radon measurements at Swakopmund, Walvis Bay, and a monitoring location in-between Arandis and the Rössing Mine;<br>o Due to the inhalation of radioactive ambient atmospheric dust containing long-lived radioactive constituents: approx. 0.003 mSv/a for adults and 0.002 mSv/a for infants, as inferred from a recent regional air quality assessment; and<br>o Due to exposure to gamma radiation from terrestrial and cosmic sources: approx. 0.95 mSv/a, as inferred from the terrestrial and cosmic contributions determined during the on-site gamma dose rate assessment. |
| Socio-economic | • Arandis is the nearest town to the Project site.<br>• Project site within the #Gaingu Communal Conservancy. |

# 6.0 Potential Project Risks and Impacts

This section provides a brief description of potential issues and presents an early evaluation of potential impacts associated with the proposed project. The potential impacts are documented in Chapter 7.0 of the SR.

## 6.1 Impact identification

A scoping-level identification of environmental impacts (physical, biological, social and economic) potentially associated with the proposed Project is summarised in this section. The sequence in which these issues are listed are in no order of priority or importance. The section identifies all potential impacts, as raised by the project team and I&APs and provides consideration on the relevance of the impacts to the proposed project. Potential impacts of relevance to the proposed Project will be assessed in detail during the EIA phase using the methodology presented in Section 8.4 of the SR.

## 6.2 Public Concerns

The issues and concerns raised by I&APs to date are included in a Comments and Responses Report in the Final Scoping Report (see Appendix C).

## 6.3 Preliminary evaluation of environmental and social impacts

The potential impacts considered to be of relevance and the requirements for further investigation during the EIA phase, either by the EAP or by the identified specialist, are identified in the following table. It is possible that additional impacts will be added based on I&AP inputs or the results of the site assessments of the EAP and of the relevant specialists.

**Table 3: Preliminary assessment of impacts**

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| **Land uses and capability** | | | |
| Direct | Currently the footprint is nominally set aside for conservation (#Gaingu Conservancy).<br>Development of the site as a general and hazardous waste facility will forego this opportunity. | Negative | ▪ Assessment of agricultural and land use potential to determine potential loss – Soils and Agricultural Assessment. |
| Direct | Conflict with other proposed/planned uses of the site or local area. | Negative | ▪ Assessment by EAP with consideration of Soils and Agricultural Assessment, and Socio-economic Study. |
| **Topography and soils** | | | |
| Direct and Cumulative | Site clearance and levelling during the construction phase will cause some additional exposed areas and could trigger erosion and siltation | Negative | ▪ Assessment by EAP with consideration of Project Design, Soils and Agricultural Assessment, and Hydrology Study. |
| Direct and Cumulative | Loss of topsoil during construction through site clearance or poor handling and stockpiling. | Negative | ▪ Assessment of soils to determine potential loss – Soils and Agricultural Assessment. |
| Direct and Cumulative | Contamination of soils as a result of contaminant spillage during construction or operations | Negative | ▪ Assessment of soils to determine potential loss – Soils and Agricultural Assessment. |
| Direct | Change in topography due to the construction of waste cells of 25 meters high. | Negative | ▪ Assessment by the EAP. |
| ▪ **Biodiversity (Flora)** | | | |

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| Direct | The clearance for the construction of the proposed structures and infrastructure will result in vegetation loss.<br>Loss of floral species of conservation concern (SCC) (if present).<br>Diversion of surface water flows could affect flora in downstream environments. | Negative | ▪ Assessment of flora to determine potential loss – Biodiversity Assessment.<br>▪ Assessment of alteration of surface water flows – Hydrological Assessment. |
| Indirect | Accidental introduction of alien species and invaders with imported materials | Negative | ▪ Assessment of flora to determine potential risks – Biodiversity Assessment. |
| ▪ **Biodiversity (Fauna)** | | | |
| Direct and Cumulative | Habitat destruction or displacement/loss of faunal SCC (if present) during construction.<br>Habitat fragmentation and disturbances to faunal species during operations. | Negative | ▪ Assessment of fauna to determine potential risks – Biodiversity Assessment. |
| Direct and Cumulative | Fauna mortalities from interactions with waste infrastructure/waste transport vehicles. | Negative | ▪ Assessment of fauna to determine potential risks – Biodiversity Assessment. |
| ▪ **Social** | | | |
| Direct and Cumulative | Job creation and skills development | Positive | ▪ Assessment of potential benefits – Socio-economic Assessment. |
| Direct and Cumulative | Economic stimulation | Positive | Assessment of potential benefits – Socio-economic Assessment. |
| Indirect and Cumulative | Degradation of the regional sense-of-place (tourism) | Negative | ▪ Assessment of potential risks – Socio-economic Assessment. |
| Indirect and cumulative | Health risks to employees and public from general and hazardous waste handling. | Negative | ▪ Assessment of potential risks to health – Air Quality Impact Assessment and Radiation Assessment. |
| ▪ **Climate change** | | | |
| Direct and Cumulative | Greenhouse gas emission contributions (climate protection) | Negative | ▪ Air Quality Impact Assessment to quantify potential greenhouse gas emissions. |

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| ▪ **Waste Management** | | | |
| Direct | Implementation of the waste management hierarchy to obtain the most sustainable result from waste streams through recovery, where possible | Positive | ▪ Assessment by the EAP with consideration of Project Design |
| Direct | Legal disposal of waste to managed facility | Positive | ▪ Assessment by the EAP with consideration of Project Design<br>▪ |
| ▪ **Traffic** | | | |
| Direct | Increased volume of heavy vehicles on the access roads and high-risk nature of the loads of hazardous waste on the vehicles resulting in road safety concerns. | Negative | ▪ Traffic Impact Assessment to assess the potential change in vehicle volumes and the likely impacts on road safety. |
| Direct | Increased volume of heavy vehicles on the access roads causing degradation to road infrastructure and level of service. | Negative | ▪ Traffic Impact Assessment to consider the suitability of the access roads and intersections for the potential traffic load. |
| ▪ **Heritage** | | | |
| Direct | Destruction of heritage resources on the site | Negative | ▪ Assessment of heritage resources to determine potential risks – Heritage Assessment. |
| ▪ **Hydrogeology** | | | |
| Direct | Reduction in groundwater quality from exposure to leachate | Negative | ▪ Specialist Hydrogeological Impact Assessment to determine the contaminant sources, model the dispersion plume and assess impacts on groundwater quality. |
| Direct | Dispersion of contaminants and reduction in groundwater quality influencing other users | Negative | ▪ Sensitive receptors to be identified.<br>▪ Specialist Hydrogeological Impact Assessment to model the dispersion plume and assess impacts on identified receptors. |
| ▪ **Hydrology** | | | |
| Direct | Increase in runoff and erosion from the site resulting in increased sediment loads | Negative | ▪ Hydrological Assessment to consider potential risks during construction and operation. |
| Direct | Reduction in surface water quality in the | Negative | ▪ Hydrological Assessment to identify risks and determine |

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| | watercourse/resource from exposure to general and hazardous wastes or other contaminants | | management of storm water during construction and operation. |
| Direct | Alteration of flow paths, beds and banks of watercourse | Negative | ▪ Consideration of facility design by the EAP and hydrological specialist.<br>▪ Hydrological Assessment to determine management of storm water during construction and operations. |
| Direct | Flood risk to the NMF from upstream surface flows.<br>Reduction in runoff volumes to the catchment from containment of runoff | Negative | ▪ Hydrological Assessment to determine typical and extreme flows.<br>▪ Consideration of designs of storm water facilities by EAP and hydrological specialist to ensure maximum diversion of clean storm water to the environment. |
| ▪ **Air Quality** | | | |
| Indirect | Increase in local dust fall levels resulting in nuisance at receptors | Negative | ▪ Sensitive receptors to be identified.<br>▪ Air Quality Impact Assessment to compile emissions inventory to identify sources; undertake modelling to predict emissions and estimate dispersion plumes for dustfall, particulates and criteria air pollutants. |
| Direct | Increase in odours at receptors | Negative | ▪ Sensitive receptors to be identified.<br>▪ Air Quality Impact Assessment to assess potential for odour generating activities and to consider dispersion of such gases to receptors. |
| Direct | Increase in gaseous emissions | Negative | ▪ Air Quality Impact Assessment to compile emissions inventory to identify sources; undertake modelling to predict emissions and estimate dispersion plumes for dustfall, particulates and criteria air pollutants.<br>▪ Consideration of plant design and emissions controls by Air Quality specialist to ensure emissions comply with standards or better. |
| Direct | Increase in ambient levels of criteria air pollutants at receptors | Negative | ▪ Air Quality Impact Assessment to assess emissions of criteria air pollutants against legislated limits.<br>▪ Consideration of plant design and emissions controls by Air Quality |

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| | | | specialist to ensure emissions comply with standards or better. |
| Indirect | Health risks to nearby receptors from inhalable particulates and or pollutants | Negative | ▪ Sensitive receptors to be identified.<br>▪ Air Quality Impact Assessment to compare modelling and dispersion results against legislated and best practice limits to assess health risks to key receptors. |

# 7.0 Terms of Reference for EIA

The Terms of Reference for the Impact Assessment phase of the EIA process is presented in Chapter 8.0 of the SR. This includes details of the specialist studies to be undertaken, the methodology for impact assessment, the integration of the relevant information into an EIA Report and EMP, and consultation to be undertaken in the EIA phase.

## 7.1 Specialist Studies

The following specialist studies will be undertaken.

**Table 4: Terms of Reference for the proposed Specialist Studies**

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| **Terrestrial Biodiversity**<br>**(Henriette Potgieter)** | • Provide a broad description of the existing environment in terms of its terrestrial biodiversity (including Avifauna, Animal and Plant species), based on a field survey and available literature;<br>• Identify, map (locations of species of conservation concern and conservation value / sensitivity map) and describe the features/resources present on site that could be affected by the proposed project, based on a field survey and available literature;<br>• Identification of terrestrial biodiversity features of importance/sensitivity that could be affected by proposed activities;<br>• Determination of potential impacts of proposed activities on terrestrial biodiversity features;<br>• Investigate ecological / biodiversity processes that could be affected (positively and/or negatively) by the proposed project;<br>• Assess the significance of the loss of faunal species, and impact on ecological / biodiversity processes as a result of the implementation of the proposed project; and<br>• Identify practicable mitigation measures to reduce any potential negative faunal impacts and indicate how these could be implemented in the construction and management of the proposed project. |
| **Socio-economic**<br>**(SusDaF)** | • Provide a broad social description of the area in the vicinity of the proposed project;<br>• Provide a detailed description of the socio-political history and demographics of the area;<br>• Identify and assess potential social impacts as a result of the proposed project. This may include, but is not limited to, the following aspects:<br>• Creation of employment and local expenditure;<br>• Impact on local communities and surrounding landowners due to external construction workers and influx of job-seekers;<br>• Sense of health and well-being of affected communities and surrounding landowners;<br>• Impact on existing land use and economic activities;<br>• Generation of clean, renewable energy; and<br>• Social sustainability of the proposed project, identifying feasible alternatives to ensure social equity and justice.<br>• Determine whether the distribution of potential negative impacts unfairly discriminate against any |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| | person, particularly vulnerable or disadvantaged persons; and<br>• Identify practicable mitigation measures that would reduce potential negative impacts and enhancement measures to increase potential social benefits. |
| **Visual**<br>**(Graham Young Landscape Architects)** | • Identify sensitive receptors, determine key visual characteristics, features and viewpoints;<br>• Map, significant visual characteristics features, viewpoints and visual receptors associated with the site;<br>• Establish visual intrusion, visibility and visual exposure of the project components in the receiving environment.<br>• Identification of visual receptors, viewsheds of importance and sense of place that could be affected by proposed activities;<br>• If necessary to inform the assessment, undertake simulation of visual change/viewshed analysis caused by the project to receptors;<br>• Assess the significance of potential visual impacts resulting from the proposed project from various important viewpoints, e.g., transport corridors, neighbouring farmsteads / residential areas, recreational areas and other surrounding land-uses (i.e., viewer-observer distances, bulk, compatibility with surrounding area, viewer catchments, etc.); and<br>• Identify practicable mitigation measures to reduce potential negative visual impacts and to identify how these can be built into the project design. |
| **Heritage/Archaeological/Paleontological**<br>**(Beyond Heritage)** | Provide a description of the archaeology, palaeontology and cultural heritage of the site and identify and map any sites of archaeology, palaeontology or cultural significance that may be impacted by the proposed project:<br>• Assess the sensitivity and conservation significance of any sites of archaeological, palaeontology or cultural heritage significance affected by the proposed project;<br>• Identify and assess the significance of the potential impacts of the proposed project on archaeological, palaeontology and cultural heritage;<br>• Make recommendations on the protection and maintenance of any significant cultural heritage and/or archaeological / palaeontology sites that may occur on site;<br>• Identify practicable mitigation measures to reduce potential negative impacts on the archaeological / palaeontology resources and indicate how these |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| | can be incorporated into the construction and management of the proposed project;<br>• Provide guidance for the requirement of any permits from the National Heritage Council of Namibia that might become necessary. |
| **Traffic Assessment**<br>**(Burmeister and Partners)** | • Determination of the transport requirements of the project and its phases<br>• Investigate, assess and map the road infrastructure and traffic baseline<br>• Provide a description of the surrounding road network;<br>o Conduct manual traffic counts at key traffic intersections within the vicinity of the project site;<br>o Categorise heavy vehicles and light motor vehicles<br>o Trip making characteristics of local residents;<br>o Road network status and capacity<br>o Road pavement conditions<br>o Geometric details of intersections<br>o Identification of existing management and control problems<br>• Determine trip generation characteristics of the project<br>• Map all traffic infrastructure associated with the site and potentially affected areas<br>• Identification of traffic features and environment that could be affected by proposed activities<br>• Identify practicable mitigation measures that would reduce potential negative impacts and enhancement measures to increase level of service for any affected intersections. |
| **Air Quality Assessment**<br>**(SLR)** | • Identify, map and describe the physical and air quality parameters of relevance within the project area;<br>• Generate a project emissions inventory and predict dispersion to define potential impacts resulting from the planned project activities;<br>• Consider cumulative impacts on the areas air quality; and<br>• Produce appropriate management and mitigation plans required to ensure that potential impacts are adequately addressed. |
| **Radiation Assessment** | • This study has been removed from the EIA scope as the applicant has elected not to include the disposal of radioactive waste in the current application. This may be revisited in future. |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| **Soils and Agricultural Assessment**<br>**(The Biodiversity Company)** | • Consult with engineering team/EAP to source required project parameters.<br>• Identify possible sources of existing information and negotiate access, if necessary.<br>• Review of existing reports, soils and agricultural databases, aerial photos, topographical maps and satellite imagery.<br>• Review data on soils, vegetation, erosion, agricultural resources, potential and productivity, employment etc.<br>• Review relevant legislation to determine requirements for data collation and reporting.<br>• Review MAWLR departmental requirements.<br>• Collate information from external sources on soils and agricultural resources.<br>• Conduct field work to identify, describe, characterise, assess and map the soils, and agricultural resources as per the relevant protocol.<br>• Map on a detailed plan all soils and agricultural resources associated with the site and potentially affected areas.<br>• Provide a comprehensive baseline description of the receiving soils and agricultural resources of the site as per the relevant protocol.<br>• Document the findings in a Soils and Agricultural Specialist Assessment Report.<br>• Recommend the appropriate mitigation for each soil and agricultural resource to reduce potential impact significance.<br>• Present the mitigation as potential impact management actions and potential impact management outcomes for inclusion in the EMP.<br>• If necessary, develop a 'monitoring program' for overall project operations. |
| **Hydrogeology**<br>**(SLR)** | • Identify aquifers and receptors across the site and surrounds.<br>• Determine and delineate key geological structures and geohydrological features that could act as preferential flow paths for the movement of groundwater.<br>• Conduct percolation tests to determine the permeability of the shallow soils.<br>• Map, on a detailed plan, all geohydrological features, resources and receptors associated with the site and potentially affected areas.<br>• Provide a comprehensive description of the receiving geohydrological environment.<br>• Develop a numerical groundwater flow model: |

| Specialist Study<br>(appointed consultants) | Terms of Reference |
|---|---|
| | ○ Prepare conceptual model of the dynamics of the groundwater system including aquifer distribution and groundwater flow directions.<br>○ Develop a groundwater transport model.<br>○ A solute transport model must be used to determine particle tracking from potential pollution sources (waste cells, dams) for both business scenarios.<br>• Consideration of sources, pathways and receptors.<br>• Potential groundwater pollution sources must be identified.<br>• Determination of potential inflows into the waste cells.<br>• Inputs into site water balance.<br>• Assess the risk to groundwater and recommend mitigation measures that should be in place to minimize impacts from risks identified.<br>• Identification and simulation of various mitigation options.<br>• Identification of the need for dewatering or diversions based on numerical model.<br>• Design of the optimum groundwater management strategy, with inputs to design engineers (if required).<br>• Define a groundwater monitoring protocol/programme suitable to detect change in the receiving environment and relate to this project or other influences. |
| **Hydrology**<br>**(SLR)** | • Identify, characterise and map the surface water environment on, adjacent to, and immediately downstream of the project area;<br>• Describe the physical and hydrological parameters of relevance, with particular respect to water quality and flow parameters;<br>• Delineate and assess flood lines (50 and 100 year) for the watercourses on the site in terms of accepted protocols;<br>• Develop a concept for diverting flow in impacted watercourse(s) around the facility;<br>• Define potential impacts resulting from the planned project activities and<br>• Consider cumulative impacts on the area's hydrology; and to produce appropriate management and mitigation plans required to ensure that potential impacts are adequately addressed. |

## 7.2 Consultation in the EIA Phase

All I&APs on the project database will be notified of relevant events in the EIA process via electronic mail, or if required, post. The draft EIA Report (including specialist studies, EMP and other appendices) will be released for a 30-day review and comment period.

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# Tables in Text

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# Acronyms and Abbreviations

| Acronym / Abbreviation | Definition |
|---|---|
| CITES | Convention on International Trade in Endangered Species |
| DEA | Department of Environmental Affairs |
| DEAWMPCI | Division of Environmental Assessment, Waste Management and Pollution Control, and Inspections |
| EAP | Environmental Assessment Practitioner |
| ECC | Environmental Clearance Certificate |
| EIA | Environmental Impact Assessment |
| EMA | Environmental Management Act (Act 7 of 2007) |
| EMP | Environmental Management Plan |
| EPL | Exclusive Prospecting Licences |
| ERT | Electrical Resistivity Tomography |
| ESIA | Environmental and Social Impact Assessments |
| FEL | Front-end loader |
| GDP | Gross Domestic Product |
| I&APs | Interested & Affected Parties |
| IPPR | Institute for Public Policy Research |
| LC | Leachable Concentration |
| MAWLR | Ministry of Agriculture, Water and Land Reform |
| MEA | Multilateral Environmental Agreements |
| MEFT | Ministry of Environment, Forestry and Tourism |
| ML | Mining Licences |
| MME | Ministry of Mines and Energy |
| MWT | Ministry of Works and Transport |
| NACSO | Namibian Association of Community Based Natural Resource Management Support Organisations |
| Namwaste | Namwaste (Pty) Ltd |
| NGL | Natural Ground Level |
| NHC | National Heritage Council |
| NIMT | Namibian Institute of Mining and Technology |
| NMF | Namwaste Management Facility |
| NNE | North northeast |
| NNNP | Namib Naukluft National Park |
| NRPA | National Radiation Protection Authority |
| NSA | Namibia Statistics Agency |
| Orano | Orano Mining Namibia (Pty) Ltd |
| PPP | Public Participation Process |
| Rent-A-Drum | Rent-A-Drum (Pty) Ltd |
| RUL | Rössing Uranium Limited |
| SADC | Southern African Development Community |
| SANS | South African National Standards |
| SEA | Strategic Environmental Assessment |
| Séché | Séché Environnement Group |
| SLR | SLR Environmental Consulting (Namibia) (Pty) Ltd |

| Acronym / Abbreviation | Definition |
|---|---|
| SR | Scoping Report |
| SSW | South southwest |
| TC | Total Concentration |
| TDS | total dissolved solids |
| TLB | Tractor Loader Backhoe |
| TSAS | Technical Services Acceptance Sheet |
| UNCBD | United Nations Convention on Biological Diversity |
| UNDRIP | United Nations Declaration on the Rights of Indigenous Peoples |
| WMF | Waste Management Facility |

# 1.0 Introduction

This chapter describes the purpose of this report, briefly describes the project, summarises the legislative authorisation requirements, provides the terms of reference for the Environmental Impact Assessment process, and describes the structure of the Scoping Report.

## 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 sector. 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.

SLR Environmental Consulting (Namibia) (Pty) Ltd has been appointed by Namwaste as the Independent Environmental Assessment Practitioner to undertake a full Scoping and Environmental Impact Assessment (EIA) process for the proposed NMF Project.

## 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 in 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.

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

The main project components are detailed in Table 1-1 below. The project components are discussed in further detail in Section 5.0.

**Table 1-1: Summary of Project Components**

| Project Component | Details |
|---|---|
| Waste Treatment Facility | ○ 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);<br>○ Landfill leachate collection and containment in suitable facilities;<br>○ 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;<br>○ Warehouse with a concrete slab for off-loading of arsenic waste in bulk bags;<br>○ Workshop;<br>○ Office block;<br>○ Parking area;<br>○ Staff dining and ablution facilities;<br>○ Package sewage plant (all sewage generated on the site will be treated on site); and<br>○ Air quality monitoring station (if required). |
| Stormwater Management Infrastructure | ○ Stormwater/ run-off management infrastructure for collection and containment of any contaminated water in dams;<br>○ V-drain around the upstream side of the site to divert clean stormwater off site; |
| Access Infrastructure | ○ Access road (~8 m wide) from the entrance of the industrial area of Arandis to Trekkopje Road (~3.3 km) or from the proposed alternative access off the B2 to the Trekkopje Road (4.8 km) to allow trucks to bypass the town of Arandis;<br>○ Access control facilities including perimeter fencing;<br>○ Weighbridges and control room;<br>○ Internal roads;<br>○ 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; |
| Water Infrastructure | ○ Bulk water supply pipeline to convey water to the site from the Orano desalination plant. The pipeline will extend from the existing pipeline at the Orano Uranium Mine to the site (approximately 20 km). Daily water consumption is estimated to be 150 $m^3$ per day;<br>○ Water pump station at the Orano Uranium Mine and on-site water storage at NMF (2 x 30 $m^3$ JOJO type tanks);<br>○ Boreholes for abstraction of water (50 $m^3$ per day);<br>○ Borehole water monitoring network; |
| Electrical Infrastructure | ○ Electrical supply (estimated 350 kVA) and substation connected to nearest supply in Arandis (approximately 15 km); |

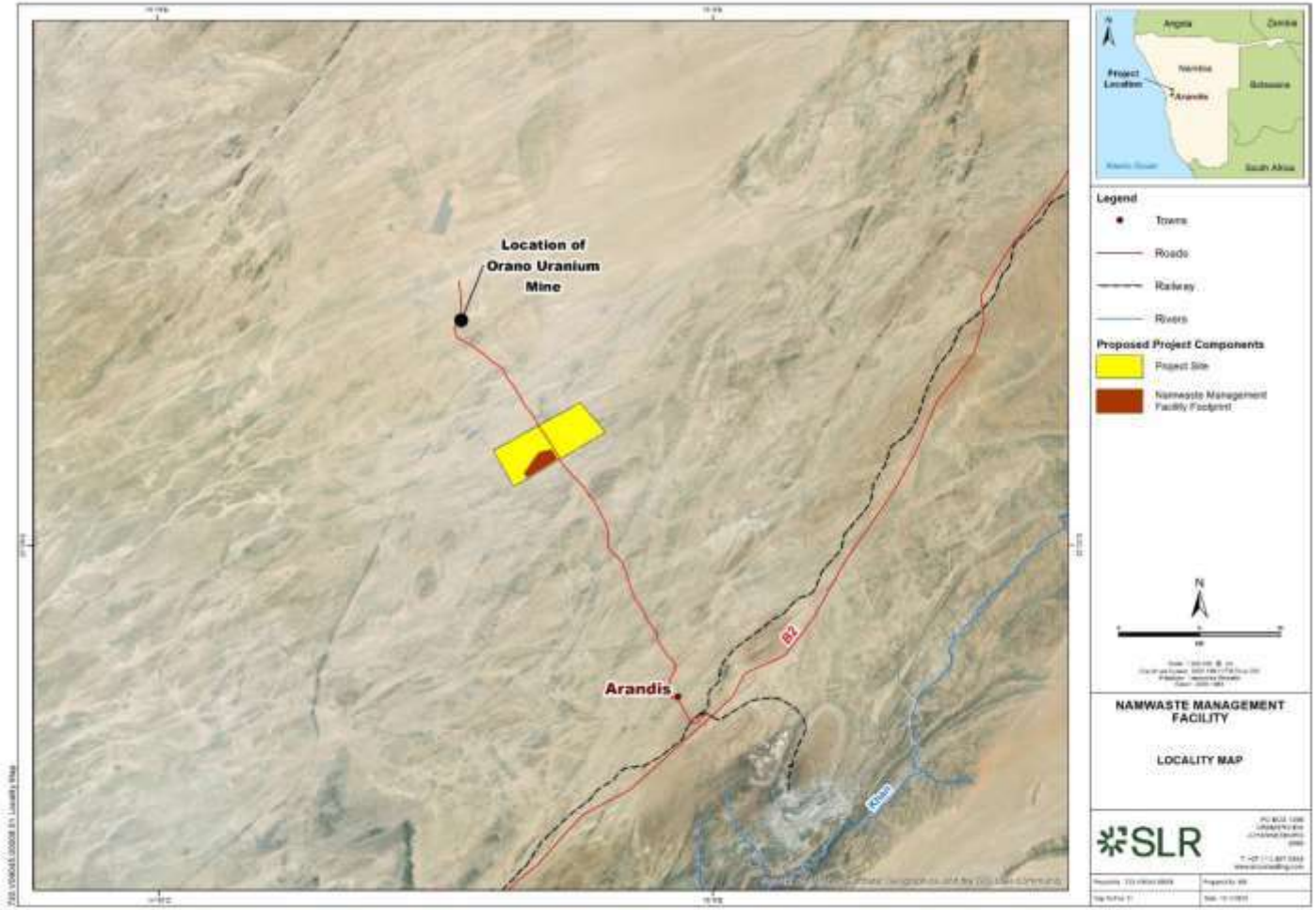


**Figure 1-1: Locality of Project Site**

## 1.3 Introduction to the Environmental Impact Assessment Process

In Namibia, the Environmental Impact Assessment process is regulated by the Directorate of Environmental Affairs (DEA) division of the Ministry of Environment, Forestry and Tourism (MEFT) in terms of the Environmental Management Act (EMA), (Act 7 of 2007). EIA Regulations were promulgated on 6 January 2012 and provide for the control of listed activities and regulate the procedures and documentation when undertaking an EIA process.

The EIA process is an interdisciplinary and multi-step procedure to ensure that environmental considerations are included in decisions regarding projects that may impact the environment (See Figure 1-2).

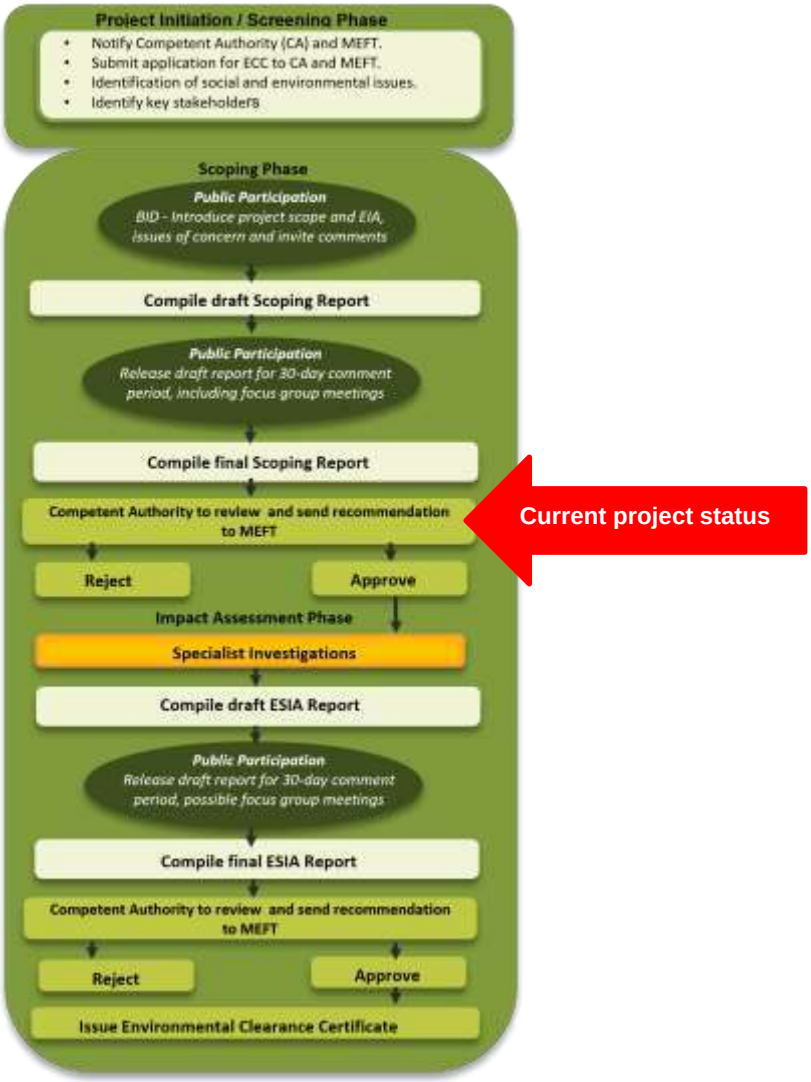


**Figure 1-2: Illustration of the EIA process**

The EIA process includes project initiation / screening & application, scoping and impact assessment phases, as well as the compilation of an Environmental Management Plan (EMP) to ensure that the potential environmental and social impacts are avoided / minimized, during the life of a project.

The EIA regulatory process aims to:

- Notify Interested & Affected Parties (I&APs) about the proposed NMF Project and EIA process and provide reasonable opportunity for involvement;
- Provide information on the project and its alternatives;
- Document the baseline environment that may be affected;
- Identify environmental and social aspects, in consultation with I&APs, and assess the potential impacts of the proposed project and its alternatives;
- Present appropriate management and mitigation or optimisation measures to avoid or minimise potential negative impacts or enhance potential benefits, respectively; and
- Allow for informed, transparent and accountable decision-making by the relevant authorities.

## 1.4 Purpose of this Report

The Project is currently within the Scoping phase of the EIA process (Figure 1-2) and a draft Scoping Report was made available to I&APs for review and comment as part of the public participation process.

The Scoping Report introduces the proposed project and describes the affected environment; summarises the EIA process followed to date and identifies the key project issues that will be further investigated and assessed / addressed in the Impact Assessment phase of the EIA. This report also provides the terms of reference for the additional assessment work.

I&APs were invited to comment on the draft Scoping Report (see Section 1.4.2). Subsequent to the review and comment period, and considering the comments received, the Scoping Report has been updated. The Final Scoping Report has been submitted to the MEFT for consideration, review and acceptance/ rejection.

### 1.4.1 Structure of the Scoping Report

This Scoping Report has been prepared in compliance with Section 8 of the EIA Regulations and is divided into various chapters and appendices, the contents of which are outlined in Table 1-2 below.

**Table 1-2: Structure and Content of the Report**

| Section | Contents |
|---|---|
| Executive Summary | Provides a comprehensive synopsis of the Scoping Report. |
| Chapter 1 | **Introduction**<br>Provides a brief description of the project background, Summarises the legislative authorisation requirements, describes the purpose of this report, describes the structure of the report, outlines the opportunity for comment and provides the terms of reference. |
| Chapter 2 | **Legislative and policy context**<br>Outlines the key legislative requirements applicable to the proposed project. |
| Chapter 3 | **Environmental Impact Assessment approach and methodology**<br>Outlines the methodology for the assessment and consultation process undertaken during the EIA. |
| Chapter 4 | **Need and desirability**<br>Details the strategic context within which the project is framed and provides the motivation for the project. |
| Chapter 5 | **Project description** |

| Section | Contents |
|---|---|
| | Provides an outline of the planned development infrastructure and the Project alternatives that have been identified for further consideration in the EIA process. |
| Chapter 6 | **Description of the affected environment**<br>Describes the existing biophysical and socio-economic environment that could potentially be affected by the proposed project and determines the relevant study area. |
| Chapter 7 | **Potential project risks and impacts**<br>Describes potential issues and impacts associated with the proposed project. |
| Chapter 8 | **Terms of Reference for EIA**<br>Describes the nature and extent of further investigations to be undertaken during the EIA phase and sets out the proposed approach to the impact assessment phase. |
| Chapter 9 | **References**<br>Provides a list of the references used in compiling this report. |
| Appendices | Appendix A: Curriculum vitae<br>Appendix B: Copy of Environmental Clearance Certificate application form<br>Appendix C: Stakeholder Engagement Documents<br>Appendix D: Impact Assessment Methodology |

### 1.4.2 Opportunity to Comment

The Draft Scoping Report was distributed for a 30-day comment period from **15 November 2023 to 15 December 2023** and Interested & Affected Parties (I&APs) were provided with opportunity to comment on any aspect of the proposed project and the findings of the EIA process to date. Copies of the full report were available on the SLR website (at https://www.slrconsulting.com/public-documents/namwaste-nmf/) and at the following location:

| Name of Facility |
|---|
| Arandis Community Library, Arandis |

Comments received by SLR at the address, telephone/fax numbers or e-mail address shown below **on or before 15 December 2023** have been included in this Final Scoping Report.

**SLR Environmental Consulting (Namibia) (Pty) Ltd**

**Attention:** Stephanie Strauss

**Postal Address:** 8 General Murtala Muhammed Ave, Eros Windhoek

**Tel:** 061 231 287 **WhatsApp:** 081 357 2109

**E-mail:** namwaste@slrconsulting.com

# 2.0 Environmental Policy, Planning and Legal Framework

This chapter provides an overview of relevant Namibian legislation and policy, summarises the Namibian administrative framework and describes the international treaties, industry standards and guidelines applicable to the EIA process for the NMF Project. In accordance with the EIA Regulations, all legislation and guidelines that have been considered in the EIA process must be documented.

## 2.1 Namibian Institutional and Administrative Structure

### 2.1.1 Introduction

The Namibian Constitution makes provision for the creation and enforcement of applicable legislation. Namibia has five tiers of law which include the following:

- The Constitution;
- Statutory law;
- Common law;
- Customary law; and
- International law.

At Independence in 1990, the Government of the Republic of Namibia recognized the importance of the environment, by including the protection of natural resources in the Constitution. Within this context, and in accordance with the Constitution, Namibia has passed numerous laws intended to protect the natural environment and to mitigate against adverse environmental impacts.

Several of the Acts, as well as various policies, are relevant to the NMF Project. This section details the institutional framework responsible for implementing the relevant legislation (described in Section 2.2).

### 2.1.2 Ministry of Environment, Forestry and Tourism

The mission of the MEFT is to promote biodiversity conservation in the Namibian environment through the sustainable utilization of natural resources and tourism development for the maximum social and economic benefit of its citizens. MEFT develops, administers and enforces environmental legislation and policy.

The MEFT's DEA is mandated to give effect to Article 95L of the Constitution by promoting environmental sustainability. The Environmental Commissioner serves as head of the DEA. The DEA is responsible for, inter alia, the administration of the EIA process undertaken in terms of the EMA and the EIA Regulations.

- The DEA will be responsible for issuing a decision on the application for an Environmental Clearance Certificate (ECC).

### 2.1.3 Ministry of Mines and Energy

The Ministry of Mines and Energy (MME) comprises six directorates including the Directorate of Energy, which is responsible for developing and implementing Namibia's energy sector policies, strategies, and plans and the Directorate of Mines who is responsible for the

supporting mineral resource development and is the responsible authority for administration of Namibia's mining licences.

The MME is a key stakeholder in the project and the EIA process due to the proposed electrical transmission infrastructure to be developed as part of the NMF, as well as in relation to the extraction of material to be used for construction purposes and as cover material during waste disposal (e.g. borrow pits on site). MME will be required to review the Scoping and EIA Reports and submit comments to MEFT.

### 2.1.4 Ministry of Works and Transport

The Ministry of Works and Transport (MWT) aims to ensure and regulate the provision of safe, effective and efficient infrastructure and services which are responsive to the socio-economic needs of the public.

The Department of Transport is responsible for transport in the different modes, namely road, rail, air and sea. Its mission is to ensure the provision of safe and efficient transport services and infrastructure in the country in balance with demand in the different modes.

The MWT is a key stakeholder in the project and the EIA process due to the proposed roads to be developed to ensure access to the NMF. MWT will be required to review the Scoping and EIA Reports and submit comments to MEFT.

### 2.1.5 Ministry of Agriculture, Water and Land Reform

The Ministry of Agriculture, Water and Land Reform (MAWLR) has as its mission the realization of the potential of the Agricultural, Water and Land Reform sectors towards the promotion of an efficient and sustainable socio-economic development for a prosperous Namibia. The MAWLR is mandated to promote, develop, manage and utilize agricultural and water resources.

The MAWLR is a key stakeholder in the project and the EIA process due to the proposed groundwater abstraction to be undertaken to supply water to the NMF. MAWLR will be required to review the Scoping and EIA Reports and submit comments to MEFT.

### 2.1.6 National Radiation Protection Authority

The National Radiation Protection Authority (NRPA) is established to provide for adequate protection of the environment and of people in current and future generations against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources.

The NRPA would need to review and approve the Radiation Management Plan to be developed as part of the Radiation Impact Assessment. However, as radioactive waste falls outside of the current scope a Radiation Management Plan will not be developed within this ESIA process.

### 2.1.7 National Heritage Council

The National Heritage Council (NHC) was established by the National Heritage Act, No. 27 of 2004. It is the administrative body responsible for the protection and conservation of Namibia's cultural and natural heritage resources.

The NHC would need to review the Heritage Impact Assessment and provide consent for the project in terms of Sections 53(7) and 55(8) of the National Heritage Act, 2004 (Act No.27 of 2004)).

## 2.2 Namibian Legal Framework

The following sections outlines the legislative, policy and regulatory framework relevant to undertaking an EIA in accordance with the EIA Regulations. It is however noted that the following is not an exhaustive list of all legislation and compliance with additional statutes may be required.

### 2.2.1 The Constitution of the Republic of Namibia (1990)

**Article 91** defines the function of the Ombudsman and, 91 (c) describes the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystem and failure to protect the beauty and character of Namibia.

**Article 95 (l)** of the Constitution of the Republic of Namibia states that *"the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future; in particular the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian Territory."*

**Article 100** states "that the land, water and natural resources below and above the surface of the land … shall belong to the State if they are not otherwise lawfully owned."

**Article 101** of the Namibian Constitution further states that the principles embodied within the constitution *"shall not of and by themselves be legally enforceable by any court, but shall nevertheless guide the Government in making and applying laws. … The courts are entitled to have regard to the said principles in interpreting any laws based on them."*

The constitutional recognition of environmental concerns triggered widespread legislative reform relating to the management of natural resources in Namibia. The country's environmental protection effort is currently comprised of the EMA and its Regulations.

### 2.2.2 Namibia's Environmental Impact Assessment Policy

The EIA Policy of 1995 promotes accountability and informed decision making through the requirement of EIAs for listed programmes and projects (activities). The EIA Policy is currently enforced through the EMA and the EIA Regulations. Refer to the following sections for details thereof.

### 2.2.3 Environmental Management Act, 2007

The EMA was promulgated in December 2007 and came into effect on 6 February 2012. Part 1 of the EMA describes the various rights and obligations that pertain to citizens and the Government. The main objectives of the Act are to ensure that:

- Significant effects of activities on the environment are considered carefully and timeously;
- There are opportunities for timeous participation by I&APs throughout the assessment process; and
- Findings are taken into account before any decision is made in respect of activities affecting the environment.

Part 2 of the EMA sets out a number of principles of environmental management which give effect to the provisions of the Constitution for integrated environmental management. Decision-makers must take these principles into account when deciding whether or not to approve a proposed project. In terms of this legal framework certain identified activities may not commence without an environmental clearance (or amendment thereto) that is issued by the office of the environmental commissioner in the MEFT.

### 2.2.4 Environmental Impact Assessment Regulations, 2012

The EIA Regulations, promulgated in 6 February 2012 (GN No. 30) in terms of Section 56 of the EMA provides for the control of certain listed activities. These listed activities are provided in GN No. 29 and are prohibited until an ECC has been obtained from MEFT. Such ECCs, which may be granted subject to conditions, will only be considered once there has been compliance with the EIA Regulations. The EIA Regulations set out the procedures and documentation that need to be complied with in undertaking an EIA process.

Namwaste is applying in terms of the EMA for an ECC for activities relating to the development and operation of a general and hazardous waste treatment and disposal facility and construction of the associated infrastructure (i.e., powerline, water pipeline and road). The following activities identified in GN No. 29 apply to the proposed project (See Table 2-1):

**Table 2-1: Listed Activities potentially triggered by the NMF Project**

| Activity | Project component |
|---|---|
| **1. Energy Generation, Transmission and Storage Activities** | |
| 1. The construction of facilities for -<br>(b) the transmission and supply of electricity; | The project involves the construction of a substation with capacity of 350kVA and powerline connecting the on-site substation to the tie-in station in Arandis. |
| 1. The construction of facilities for –<br>(d) nuclear reaction, including production, enrichments, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and waste. | No longer applicable as Namwaste has elected not to include radioactive waste disposal at the NMF. |
| **2. Waste management, Treatment, Handling and Disposal Activities** | |
| 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste. | The project involves the construction of a general and hazardous waste treatment and disposal facility. |
| 2.3 The import, processing, use and recycling, temporary storage, transit or export of waste. | |
| **3. Mining and Quarrying Activities** | |
| 3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not. | The project will require the extraction of cover material and material to be used for construction purposes (e.g. borrow pits on site for construction). |
| 3.3 Resource extraction, manipulation, conservation and related activities | |
| **5. Land Use and Development Activities** | |
| 5.1 The rezoning of land from –<br>(d) use for nature conservation or zoned open space to any other land use. | The site is located within the #Gaingu Communal Conservancy and once developed it will no longer be available for use for conservation purposes. |
| **8. Water Resource Developments** | |
| 8.1 The abstraction of ground or surface water for industrial or commercial purposes. | As an alternate to piped water supply, the project may involve the abstraction of groundwater to be used for industrial purposes. |

| Activity | Project component |
|---|---|
| 8.2 The abstraction of groundwater at a volume exceeding the threshold authorised in terms of a law relating to water resources. | |
| 8.4 Construction of canals and channels including the diversion of the normal flow of water in a riverbed and water transfer schemes between water catchments and impoundments | Portions of the project footprint may be located within drainage lines and require the diversion of drainage lines to protect infrastructure. |
| 8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems. | The project involves the construction of a package sewage plant. All sewage will be treated on site. |
| 8.8 Construction and other activities in water courses within flood lines. | Portions of the project footprint may be located within drainage lines and require the diversion of drainage lines to protect infrastructure. |
| **9 Hazardous Substance Treatment, Handling and Storage** | |
| 9.1 The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974. | The project involves the treatment, handling and storage of hazardous substances/waste. |
| 9.2 Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste. | |
| 9.4 The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location. | The project includes fuel storage (20 kL diesel storage tank) and facilities for storage of chemicals to be used in waste treatment. Cumulatively these may exceed 30 cubic metres. |
| **10. Infrastructure** | |
| 10.1 The construction of-<br>(a) oil, water, gas and petrochemical and other bulk supply pipelines; | The project involves the construction of a bulk water supply line to convey water from the Orano Mine to the site. |
| 10.1 The construction of-<br>((b) public roads; | The project involves the construction of an alternative access road which will travel around the Arandis town to join the existing Trekkopje Road. |
| 10.2 The route determination of roads and design of associated physical infrastructure where - (a) it is a public road; | |

### 2.2.5 Other Relevant Namibian Legislation

Table 2-2 below provides a summary of other relevant environmental and social legislation considered in the preparation of this Scoping Report.

**Table 2-2: Other applicable Namibia legislation**

| Sector | Law | Key Provisions and relevance to the Project |
|---|---|---|
| Transport | *Road Traffic and Transport Act, 1999 (No. 22 of 1999)* | This Act provides for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, and the control and regulation of road transport across Namibia's borders.<br>Vehicles supplying goods and services to the project during construction and operation will have to comply with the requirements of the Act. |
| Pollution / Waste | *Pollution Control and Waste Management Bill (3rd Draft September 2003)* | This Bill promotes sustainable development and provides for the prevention and regulation of the discharge of pollutants to the air, water and land; regulation of noise, dust and odour pollutions; and the establishment of a system of waste planning and management.<br>General and hazardous (such as vehicle and machine lubricants, paints and solvents) waste will be generated during construction.<br>General and hazardous waste will be treated and disposed of at the NMF. |
| | *Atmospheric Pollution Prevention Ordinance (Ordinance 11 of 1976)* | This Act provides for the prevention of the pollution of the atmosphere.<br>Construction activities, creating dust near third parties, needs to be controlled in terms of the requirements of the Act. |
| Radiation | *Atomic Energy and Radiation Protection Act No. 5 of 2005.* | The Act provides for the adequate protection of the environment and of people in current and future generations against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources. The transport and disposal of radioactive waste is regulated by the Radiation Protection and Waste Disposal Regulations made under the Act. The act prohibits the disposal, dumping or abandoning of any radiation source or nuclear material without a licence. |
| | *National Heritage Act, 2004 (No. 27 of 2004)* | This Act provides for, *inter alia*, the protection and conservation of places and objects of heritage significance. A National Heritage Council has been |

| Sector | Law | Key Provisions and relevance to the Project |
|---|---|---|
| Environmental / Conservation / Land | | established to identify, conserve, manage, and protect places and objects of heritage significance.<br>Permits are required for the removal, damage, alteration or excavation of heritage sites or remains. Any person who discovers an archaeological site should notify the National Heritage Council. These aspects could be relevant during the construction activities of the proposed project and will require to be assessed. |
| | *National Monuments Act 28 of 1969* | This Act establishes a National Monuments Council and provides for the preservation of certain property as National Monuments and the maintenance of certain burial grounds. |
| | *Nature Conservation Ordinance, 1975 (No. 4 of 1975)* | This Ordinance consolidates and amends the laws relating to the conservation of nature; the establishment of game parks and nature reserves; and the control of problem animals. The Ordinance is expected to be replaced by the Wildlife and Protected Areas Management Act in the near future (latest draft 2018). |
| | *The Nature Conservation Amendment Act, 1996 (No. 5 of 1996) and amended by Act No. 5 of 2017* | The Act enables communities to apply to Government to be registered as a conservancy. The study area for the NMF Project site overlaps the #Gaingu Conservancy (refer to Section 5). |
| | *Communal Land Reform Act, 2002 (No. 5 of 2002)* | This Act provides for the allocation and administration of all communal land and makes provision for the prevention of land degradation and for mitigating the impacts of, amongst others, water provision on the natural environment. The Act gives certain rights to communal farmers and traditional authorities and makes provision for regulations to address issues pertinent to conservation and sustainable management of water and water courses, of woods and to the combatting and prevention of soil erosion.<br><br>The NMF Project site is located on communal land owned by the Namibian Government, and the !Oe-≠Gân Traditional Authority enjoys a “right of use”. |
| | *Soil Conservation Act (Act 76 of 1969)* | The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister. |

| Sector | Law | Key Provisions and relevance to the Project |
|---|---|---|
| | | Care is to be taken in identifying any potential impacts on soil, vegetation, water supply sources and resources by firstly trying to avoid these impacts. Where they cannot be avoided, - mitigation measures should be implemented to reduce the significance of the impact(s). |
| Hazardous Substances | *Hazardous Substances Ordinance, 1974 (No. 14 of 1974)* | These provide for the control of toxic substances which may cause injury, ill health or death of human beings.<br>Various chemicals would be used and stored (paint, solvents) and hydrocarbons used during the construction and operational activities of all project components. |
| Labour | *Labour Act, 2007 (No. 11 of 2007) and its amendment: No. 2 of 2012* | These Acts stipulate, amongst other things, sound labour relations, employment equity, fair employment practices, training, minimum basic conditions of service, workplace health and safety and retrenchment.<br><br>Compliance is enforced and monitored by the Ministry of Labour through the office of the Labour Commissioner. |
| | *Social Security Act, 1994 (No. 34 of 199, as amended* | |
| | *Employees Compensation Act, 1995 (No. 5 of 1995)* | |
| | *Regulations relating to the health and safety of employees at work (GN 156 of 1997)* | These Regulations establish health and safety regulations for the workplace. |
| | *Affirmative Action (Employment) Act, 1998 (No. 29 of 1998)* | This Act aims to achieve equal opportunity in employment by redressing, through appropriate affirmative action plans, the conditions of disadvantage in employment experienced by persons in designated groups arising from past discriminatory laws and practices. |
| Electricity | *Electricity Act, 2007 (No. 4 of 2007)* | This Act provides the regulatory framework for the generation, trading, transmission, supply, distribution, import and export of electricity. |
| Health | *Public and Environmental Health Act 1 of 2015* | The Act aims to promote public health and wellbeing; prevent injuries, diseases and disabilities; protect individuals and communities from public health risks; encourage community participation in order to create a healthy environment; and to provide for early detection of diseases and public health risks. To this end, the Act contains several provisions relevant for environmental protection. The Act addresses integrated waste management in Part 9 and stipulates among others that in order to prevent environmental pollution and public health risks, local authorities must ensure that all waste |

| Sector | Law | Key Provisions and relevance to the Project |
|---|---|---|
| | | generated is collected, disposed of and recycled in accordance with the requirements of all laws governing the management of the different waste streams. The Act came into operation in 2020. |
| Water Resources | *Water Resources Management Act No. 11 of 2013* | The Act provides for the management, protection, development, use and conservation of water resources, and the regulation and monitoring of water services among others. The objective of the Act includes to ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, specific fundamental principles including, among others, equitable access to safe and sufficient drinking water; the maintenance of the water resource quality for ecosystems; and the promotion of the sustainable development of water resources based on an integrated water resources management plan which incorporates social, technical, economic, and environmental issues.<br><br>In terms of the Act a non-transferable licence is required for the abstraction and the use of water for industrial purposes. The Project includes the abstraction of groundwater as a water supply option for the Project. |

### 2.2.6 Other Relevant Namibian Policies

The scope of this report is designed to comply with the requirements of the EMA and the EIA Regulations. It is however noted that several other policies, plans and statutes are potentially applicable to the implementation of the NMF Project, including (but not limited to):

- Electricity Act, 2007;
- Labour Act, 2007;
- Local Authorities Act, 1992;
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1994);
- National Development Plan 5;
- National Integrated Resource Plan (NIRP 2016);
- National Forest Policy (1992);
- National Agricultural Policy (2015);
- National Land Policy, the National Resettlement Policy, the Agricultural (Commercial) Land Reform Act (1995);
- Land Tax and Communal Land Reform Act (2002);

- National Industrial Policy (2012);
- Policy for the Conservation of Biotic Diversity and Habitat Protection (1994);
- National Policy on Human Wildlife Conflict management (2009);
- Namibia's Climate Change Policy;
- The Namibia Vision 2030; and
- The Harambee Prosperity Plan (2021 -2025)

### 2.2.7 International Conventions

Relevant international conventions to which Namibia is a signatory are summarised below:

- Convention on Biological Diversity, 1992;
- United Nations Framework Convention on Climate Change, 1992;
- The Convention on International Trade in Endangered Species (CITES) of 1973;
- Convention to Combat Desertification 1994;
- National Rangeland Management Policy and Strategy of 2012;
- National Biodiversity Strategy and Action Plan 1 and 2 (draft);
- Vienna Convention for the protection of the ozone layer (1985);
- Montreal Protocol on substances that deplete the ozone layer (1987);
- United Nations Convention on Biological Diversity (UNCBD); and
- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) 2007.

## 2.3 International Law and Standards

A broad range of Multilateral Environmental Agreements (MEAs) are pertinent to pollution control and waste. Namibia is a party to various prominent relevant conventions, including the following:

- The Stockholm Convention on Persistent Organic Pollutants (2001),
- the United Nations Framework Convention on Climate Change (1992) and
- the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989).

With regard to transboundary pollution the legal and policy framework of the Southern African Development Community (SADC), to which Namibia is a party, also contains some relevant provisions. The SADC Protocol on Health contains a provision on environmental health, which seeks for cooperation among member states in addressing regional environmental health issues and other concerns, including toxic waste, waste management, port health services, pollution of air, land and water, and the degradation of natural resources (Ruppel-Schlichting, 2022).

# 3.0 Environmental Impact Assessment Approach and Methodology

This chapter provides the details of the EIA Project Team, describes the EIA process and methodology, and outlines the EIA assumptions and limitations.

## 3.1 Environmental Impact Assessment Process

### 3.1.1 Overview

The EIA process consists of a series of steps to ensure compliance with the objectives and the EIA Regulations, commencing formally with the Scoping phase. The process involves an open, participatory approach to ensure that impacts are identified, and that decision-making takes place in an informed, transparent and accountable manner.

The EIA process for the NMF Project is being undertaken in three phases:

- Project Initiation/Screening phase (completed);
- Scoping phase (current, in progress); and
- Impact Assessment phase.

A summary of the approach, key steps and corresponding activities in each phase of the EIA process are outlined in the following Sections.

### 3.1.2 EIA Project Team

SLR has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the required EIA process for the NMF Project proposed by Namwaste . The details of the team including EAPs and specialists undertaking the EIA process are provided in Table 3-1.

**Table 3-1: Overview of the EAP Team**

| **Details** | | | |
|---|---|---|---|
| **EIA Team** | | | |
| **Name of the practitioner** | Natalie Kohler | Matthew Hemming | Stephanie Strauss |
| Role | Project director | Technical review | Project manager and EAP |
| Contact | +264 61 231 287 | | +264 61 231 287 |
| **Postal address.:** | PO Box 86386, Windhoek | | |
| **E-mail address** | namwaste@slrconsulting.com | | |
| **Environmental and Social Specialists** | | | |
| **Aspect** | **Consultant** | | **Name** |
| **Air Quality** | SLR | | Lisa Ramsay |
| **Visual** | Graham A Young Landscape Architect | | Graham Young |
| **Heritage** | Beyond Heritage | | Jaco van der Walt |
| **Terrestrial Biodiversity** | Henriette Potgieter | | Henriette Potgieter |
| **Soils and Agriculture** | The Biodiversity Company | | Andrew Husted |

| Details | | |
|---|---|---|
| **Socio-economic** | SusDaf | Randolph Mouton |
| **Traffic** | Burmeister and Partners | Perez Goseb |
| **Hydrology** | SLR | Meeressa Pillay |
| **Hydrogeology** | SLR | Nansunga Kambinda |
| **Radiation** | VO Consulting | Detlof von Oertzen |

Curriculum Vitae of the EIA Team are included in Appendix A.

### Natalie Kohler

SLR Consulting – Principal Environmental and Social Advisor

Project director

Natalie has over 16 years consulting experience in mainly Africa and Europe and has led and managed teams across multiple sectors as part of a broad range of projects, including environmental and social impact assessments (ESIA), strategic environmental assessments, feasibility studies and waste management. Natalie has also been involved in a range of environmental compliance (regulatory and corporate standards assessments) and due diligence (DD) audits, as well as assessments in terms of the South African, best practice and International Finance Corporation (IFC) standards. Natalie has completed numerous projects in Southern Africa (South Africa, Botswana, Mozambique, Namibia), Central Africa (DRC, Zambia), East Africa (Uganda, Tanzania, Kenya, Ethiopia), West Africa (Cameroon, Ghana) and North Africa (Egypt) as well as Europe and the Middle East (UAE), in a variety of sectors including mining, oil and gas, energy/power, infrastructure industrial, waste and agriculture. These projects were conducted in line with, where applicable, corporate standards, national environmental legislations, and/or international requirements.

### Matthew Hemming

SLR Consulting – Technical Director

Technical review

Matthew has over 17 years' experience as an Environmental Assessment Practitioner within the environmental consulting field. Matthew is well versed in the authorisation and compliance requirements of all South African environmental legislation. He has managed a wide range of licensing projects including environmental authorisations, water use license and waste management license applications, mainly in the oil and gas exploration, waste management, mining, industry and electricity generation sectors. His role included project management and coordination; specialist and engineering team management; environmental impact assessment; and coordination, facilitation and undertaking of stakeholder engagement processes, including for contentious projects. Over the past few years Matthew's focus has been on assisting clients in the waste management and oil and gas field sectors. He has had involvement in site screening processes for a number of waste and onshore gas projects.

### Stephanie Strauss

SLR Consulting – Associate Environmental Consultant

Project manager and Environmental Assessment Practitioner

Stephanie is a Senior 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.

**Werner Petrick**

SLR Associate

Technical Advisor

Werner is an SLR Associate with over 24 years of experience in engineering and environmental management, principally in Namibia. Werner's experience is based on work conducted as a consultant as well as working for industry. His key projects are related to mining and power generation. Sectors of his experience includes exploration or production phases of large mining projects, power generation including renewable power initiatives and hybrid power plants, transmission lines, water supply & sanitation, petrochemical industry, linear infrastructure including roads and rail, port related projects, chemical handling and storage, large irrigation projects and other. Werner has worked on many assessments for large and complex projects in Namibia.

### 3.1.3 Screening, project initiation and application phase

The Screening phase for the NMF Project has been completed. This phase of the study included the following tasks:

- Project inception and initiation meetings held between SLR and the Namwaste Team;
- A site visit was undertaken by SLR on 8 and 9 March 2023;
- Early identification of environmental and social aspects and potential impacts associated with the proposed project activities at alternative sites;
- Limited technical investigations;
- Identification of key stakeholders to be involved in the EIA Scoping process; and
- Confirming the following:
    - The list of activities, according to the EMA EIA Regulations, that may not be undertaken without an ECC;
    - The approach to stakeholder engagement; and
    - The Scoping phase requirements.
- Compiling a Technical Feasibility Report (SLR, August 2023) outlining the above.

Based on the outcome of the Screening phase, SLR compiled the "Application for Environmental Clearance" and submitted this as both a hard copy (with revenue stamp) and electronically via the MEFT portal (please see Appendix B for a copy).

### 3.1.4 Scoping Phase

The EIA process for the NMF Project is currently in the Scoping phase (See Figure 1-2). The results of the Scoping phase to date are documented in this report.

As part of the Scoping phase, SLR undertook public participation process to inform potential I&APs of the proposed project, notify them of the EIA process, provide an initial understanding of the environmental and social baseline and project risks, and to invite registrations in the I&AP database and receive initial representations.

The Scoping phase public participation included the placement of site notices and public newspaper notices and the distribution of written notices (including an Executive Summary of the Scoping Report) to I&APs.

#### 3.1.4.1 Scoping Objectives

The objectives of the EIA Scoping process for the proposed project are to:

- Register the Project and EIA process with the relevant authorities, i.e., MEFT, through the submission of the Application for an ECC and the online registration on MEFT's website;
- Notify stakeholders and provide a reasonable opportunity for I&APs to be involved in the EIA process;
- Identify the relevant policies and legislation relevant to the proposed project and determine key gaps in relevant environmental and social legalisation;
- Provide baseline environmental and social information;
- Identify all key environmental and social issues to be addressed in the Impact Assessment phase; and
- Agree on the level of assessment to be undertaken (i.e., terms of reference for specialist studies), including the methodology to be applied, the expertise required, as well as the extent of further consultation during the impact assessment phase.

**Final Scoping Report**

Refer to Section 8.8 for the way forward for the Scoping phase and the MEFT review of the Scoping Report.

### 3.1.5 Impact Assessment phase

The Impact Assessment phase of the EIA process for the proposed NMF Project will be undertaken once (and if) the Scoping Report has been accepted by the MEFT: DEA (Environmental Commissioner). The terms of reference for the Impact Assessment phase are provided in Section 8.0.

#### 3.1.5.1 Specialist Studies

Based on the findings of the Scoping phase, various specialist studies are required to provide information and expert opinion necessary to address the key issues that require further investigation and detailed assessment. The terms of reference for each specialist study are presented in Section 8.3 and have been developed to ensure the collation of baseline data, the analysis and assessment of potential environmental impacts and the recommendation of appropriate mitigation measures to minimise / avoid potential negative impacts or enhance potential benefits, respectively. The specialist studies will be commissioned during the Impact Assessment phase.

#### 3.1.5.2 EIA Report and EMP

The specialist findings and other relevant information will be integrated into an EIA Report. Each specialist study will be included as an appendix to the EIA Report. The EIA Report will include an EMP (Refer to section 8.0 for further details regarding the EIA Report and EMP).

### 3.1.6 Public participation process

The Public Participation Process (PPP) for this EIA process aims to ensure that all stakeholders that may be affected by, or are interested in, the proposed NMF are informed of the Project and its EIA process and can register their views and concerns. Building from there, the PPP provides opportunities to I&APs to influence the project design and decision-making so that its benefits can be maximised and potential negative impacts be avoided or minimised.

#### 3.1.6.1 Stakeholders

Stakeholders included in the Project's I&AP database to date include (Table 3-2):

**Table 3-2: NMF Project Stakeholders**

| No. | Stakeholder |
|---|---|
| 1. | Ministry of Environment, Forestry and Tourism (MEFT) |
| 2. | MEFT: Department of Environmental Affairs |
| 3. | MEFT: Division of Environmental Assessment, Waste Management and Pollution Control, and Inspections (EAWMPCI) |
| 4. | Ministry of Mines and Energy (MME): |
| 5. | MME: Energy Directorate |
| 6. | Ministry of Agriculture, Water and Land Reform |
| 7. | Ministry of Regional and Local Government, Urban and Rural Development |
| 8. | Ministry of Industrialisation, Trade and SME (Small and Medium Enterprise) Development |
| 9. | Ministry of Works and Transport |
| 10. | MWT: Department of Transport |
| 11. | Ministry of Health and Social services |
| 12. | National Radiation Protection Authority |
| 13. | NamWater |
| 14. | NamPower |
| 15. | Electricity Control Board: Head Office |
| 16. | National Heritage Council of Namibia |
| 17. | Namibia Roads Authority |
| 18. | Namibia Chamber of Environment |
| 19. | Arandis Town Council |
| 20. | #Gaingu Conservancy |
| 21. | Oe-≠Gân Traditional Authority |
| 22. | Orano Mining |
| 23. | Namibia Scientific Society |
| 24. | Earthlife Namibia |

| No. | Stakeholder |
|---|---|
| 25. | Namibia Nature Foundation |
| 26. | National Botanical Research Institute |
| 27. | Chaneni Investment (Pty) Ltd |
| 28. | Langer Heinrich Uranium |

### 3.1.6.2 Steps In the Consultation Process

The steps in the consultation process that have been conducted during the Scoping Phase are indicated in Table 3-3.

**Table 3-3: Consultation Process with I&APs and Authorities**

| Task | Description | Date |
|---|---|---|
| **Notification - regulatory authorities and I&APs** | | |
| I&AP Identification | I&APs were identified and contact details obtained where possible through site visits / meetings with certain key stakeholders, telephone calls and using databases from other EIAs conducted by SLR across Namibia and previous engagements by Rent-A-Drum. A copy of the I&AP database is attached in Appendix C.<br>The process of identifying additional I&APs will be ongoing throughout the EIA. | September-November 2023 |
| Newspaper Advertisements | Block advertisements were placed as follows:<br>• Allgemiene Zeitung (15 and 22 November 2023);<br>• The Namibian Sun (15 and 22 November 2023);<br>• Republikein (15 and 22 November 2023).<br>The newspaper advertisements provided information of the proposed Project, the availability of the Draft Scoping Report and the date, time and venues of the planned public meeting. Copies of the advertisements are attached in Appendix C. | Nov 2023 |
| Notification of Draft Scoping Report Availability for Public Review | EIA Notification letters were distributed electronically (where possible) to all I&APs on the database of the availability of the draft Scoping Report for review and comment. Bulk text messages were being sent to I&APs without emails. Copies of the Executive Summary of the Draft Scoping Report were also made available on request to SLR and was available on the SLR website.<br><br>Electronic copies of the full report are available on the SLR project website (https://www.slrconsulting.com/public-documents/namwaste-nmf/) and on request to SLR (on a CD and email).<br>Hard copies of the full report are available at the following locations for review:<br>• Arandis Community Library<br><br>Authorities and IAPs were provided with 30-days to review the Draft Scoping Report and submit comments in writing to SLR Consulting. The Draft Scoping Report comment period ended on **15 December 2023.** Comments received after this date will be included in the EIA Report. | Nov 2023 |

| Task | Description | Date |
|---|---|---|
| **Scoping phase meetings and submission of comments** | | |
| Focus Group Meetings | Focus group meetings with key stakeholders were hosted as part of the scoping phase public participation. The key stakeholders met include:<br>• MAWLR<br>• MME<br>• National Radiation Protection Authority (NRPA)<br>• National Heritage Council (NHC)<br>• #Gaingu Conservancy<br>• Oe-≠Gân Traditional Authority<br>• Orano Mining<br>• Arandis Town Council<br><br>Minutes of these meetings are included with the Final Scoping Report (Appendix C).<br>Additional focus group meetings may be held during the EIA phase. | Nov/Dec 2023 |
| Public Meetings | A public meeting was held on 7 December 2023 at the Arandis Town Hall. The presentation and minutes of the meeting are included with the Final Scoping Report (Appendix C). | Dec 2023 |
| Comments and Responses | Minutes of the meetings and all comments received have been recorded and responded to in a Comments and Response Report that is included with the Final Scoping report (Appendix C). | Nov/Dec 2023 |

### 3.1.7 Assumptions and limitations

The assumptions and limitations pertaining to this EIA process are listed below:

- SLR assumes that all relevant project information has been provided and that it was correct and valid at the time it was provided. No significant changes to the project description or surrounding environment between the completion of the EIA process and implementation of the proposed Project that could substantially influence findings and recommendations with respect to mitigation and management will occur.

# 4.0 Project Need and Desirability

Waste disposal is one of the major concerns with the current solid waste management system in Namibia (MEFT, 2017). 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. Therefore, improved hazardous waste management is urgently needed in Namibia to accomplish the implementation of feasible options for hazardous waste management as one of the objectives outlined in the National Solid Waste Management Strategy (MEFT, 2017). In addition, 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 in Namibia 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.

The proposed NMF will service the mining, oil and gas, and other industrial and business sectors. The facility will be open to accept waste from anywhere in Namibia, provided transportation over long distances is feasible to the client. The majority of the waste which will be treated and/or disposed at the facility will be hazardous, but general waste will also be accepted. The NMF will offer the opportunity for disposal of general waste from surrounding communities, such as the nearby town of Arandis.

The development and operation of the proposed NMF will generate approximately 20-25 permanent employment opportunities on average, comprising of both skilled and unskilled jobs. The local communities will be given due consideration related to employment opportunities. In addition, training and skills development will be offered to employees.

The Namibian Vision 2030 policy aims to develop wealth and prosperity among the population while taking cognisance of the importance of protecting biodiversity in this process (Namibia Vision 2030, 2004). This aligns with the Séché Group’s approach to the preservation of biodiversity, which has been one of the Group’s core values since its inception over 40 years ago. A dedicated team of ecologists drive sustainable development by linking the landscape, biodiversity and environment into all activities of the Group. The development of this approach has evolved over time and Séché is now implementing biodiversity preservation and restoration programmes across operations internationally in alignment to its voluntary commitments to Act4Nature.

Accordingly, Namwaste will implement programmes to restore, preserve and enhance biodiversity around the proposed NMF, in consultation with the local community and the #Gaingu Conservancy. Biodiversity preservation and restoration will be incorporated into the design and ongoing development and management of the NMF.

# 5.0 Project Description

This chapter introduces the applicant, provides an overview of the NMF Project, its location, and provides a detailed description of the various components.

## 5.1 Details of the Applicant

The application for an ECC has been lodged by Namwaste (Pty) Ltd, contact details are provided in Table 5-1.

**Table 5-1: Applicant details**

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

## 5.2 Project Overview

### 5.2.1 Business cases

Namwaste (Pty) Ltd is considering two business cases for the NMF, which will be considered and assessed in the EIA. Business case 1 entails the facility receiving approximately 60 000 tonnes of waste per year, where approximately 50% of the waste received would be arsenic waste. Business case 2 entails the facility receiving approximately 30 000 tonnes of waste per year and no arsenic waste would be received. The differences in the site layout and infrastructure requirements between business case 1 and 2 are discussed in section 5.2.1.

The site footprint would remain the same for both business cases, thus the lifetime of the site would increase for Business Case 2 due to lower tonnages. The cells would remain as in Business Case 1 but would all be used for the disposal of general and other hazardous waste (i.e. not for disposal of arsenic dust). For Business Case 2, no warehouse for the offloading of arsenic dust would be required, no cement would be required to cover the arsenic dust big bags and no sand would be required to fill the gaps between the big bags. The cells would not contain a hydraulic barrier and each sub-phase would be developed with only one leachate dam. The risk associated with the management of arsenic dust would be removed.

### 5.2.2 Industries to be served and types of waste to be accepted

The NMF will service the mining, oil and gas, and other industrial and business sectors and will accept general and hazardous waste. The facility will be open to accept waste from anywhere in Namibia, provided transportation over long distances is feasible to the client. The majority of the waste which will be treated and/or disposed at the facility will be hazardous in nature, but general waste will also be accepted. Examples of typical waste streams which will be accepted for treatment include general waste, hazardous waste, arsenic waste (Business



case 1 only), waste, dry residues remaining after waste from the oil and gas sector has been treated, contaminated soil, liquids, sludges, chemicals, hydrocarbon contaminated waste, asbestos waste and non-infectious abattoir waste. For the purposes of this project, and in the absence of waste management specific legislation in Namibia, the term “hazardous waste” refers to 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).*

## 5.3 Project Location

A potentially suitable site for the development of the NMF was identified based on the outcome of stakeholder consultation, a screening study (Environmental Compliance Consultancy, 2022) and a Technical Feasibility Study (SLR, 2023). 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) in the Erongo Region, as shown in Figure 5-1.

The proposed site is approximately 1 500 ha in extent and the corner coordinates of the site are indicated in Table 5-2 below. As part of the site identification process, a Technical Feasibility Study (SLR, 2023) was undertaken to identify any potential fatal flaws and to identify the most suitable sections of the site for the development of a general and hazardous waste treatment and disposal facility. The study identified 4 potential areas most suitable for the development of the facility (PA1 – PA4), as shown in Figure 5-2 below. Based on the findings of the Technical Feasibility Study (discussed in detail in Section 5.8.2), Namwaste has refined a proposed footprint (based on PA4) of approximately 177 hectares for the NMF as shown in red hatching on Figure 5-3. The coordinates of the proposed footprint as shown in Table 5-3.

**Table 5-2: Coordinates of Project site**

| Corner | Latitude | Longitude |
|---|---|---|
| 1 | 22°16'50.92"S | 14°52'4.75"E |
| 2 | 22°15'14.49"S | 14°55'12.35"E |
| 3 | 22°16'14.30"S | 14°56'6.64"E |
| 4 | 22°18'3.10"S | 14°52'48.81"E |

**Table 5-3: Coordinates of the proposed Project 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 |

The project footprint is not underlain by any formal land parcel and is defined as ‘communal ground’, located in the #Gaingu Conservancy. The land is owned by the Namibian Government, and the !Oe-≠Gân Traditional Authority enjoys a “right of use”.

According to the Namibia Mines and Energy Cadastre Portal, there are not currently any Mining Licences (ML) over the target area. However, an Exclusive Prospecting Licence (EPL), which covers the target area, has been applied for by Chaneni Investment (Pty) Ltd (EPL 8801) in 2022 and is in the process of being registered, pending the issuing of an ECC as shown in Figure 5-4.

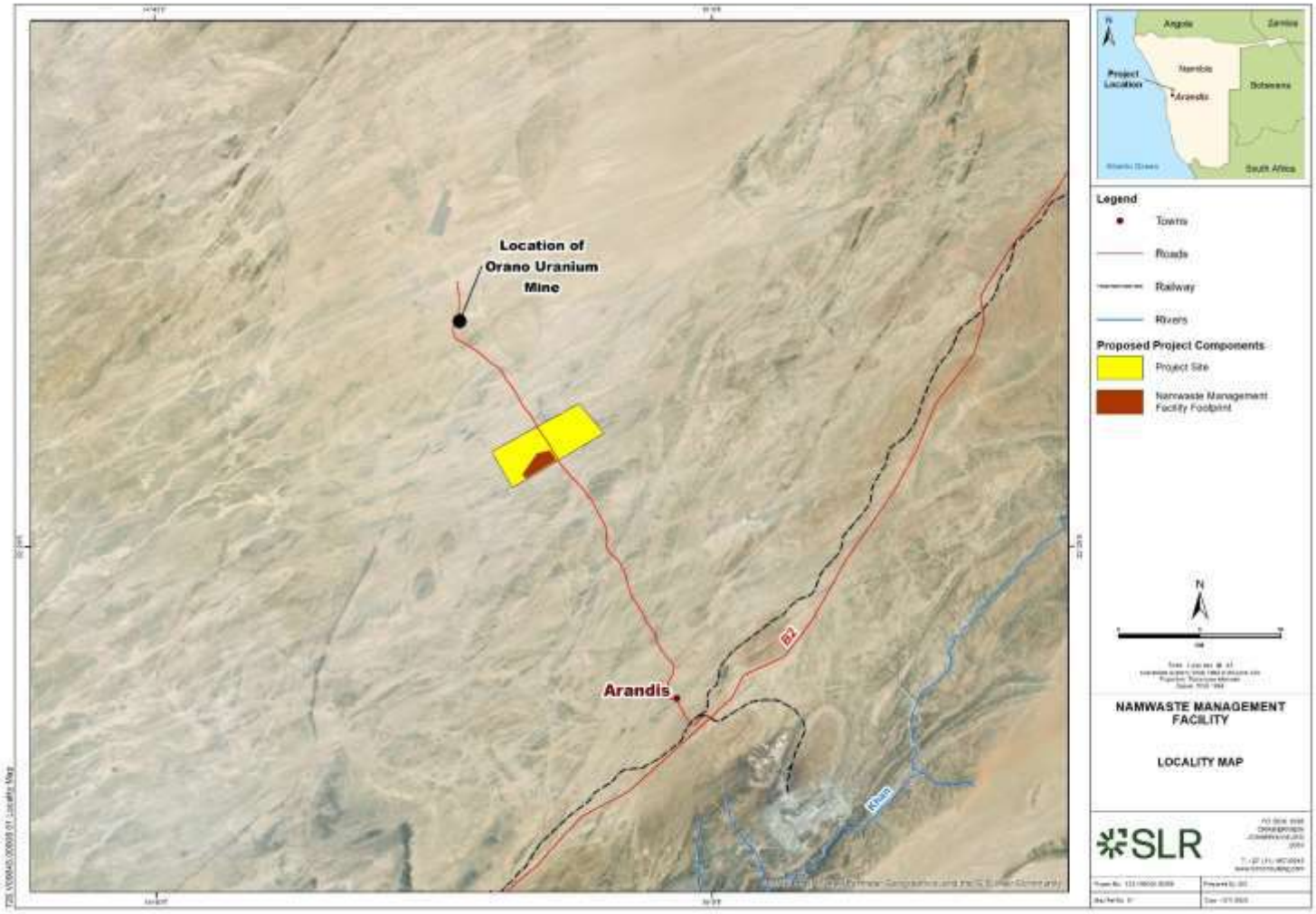


**Figure 5-1: Locality of Project site**

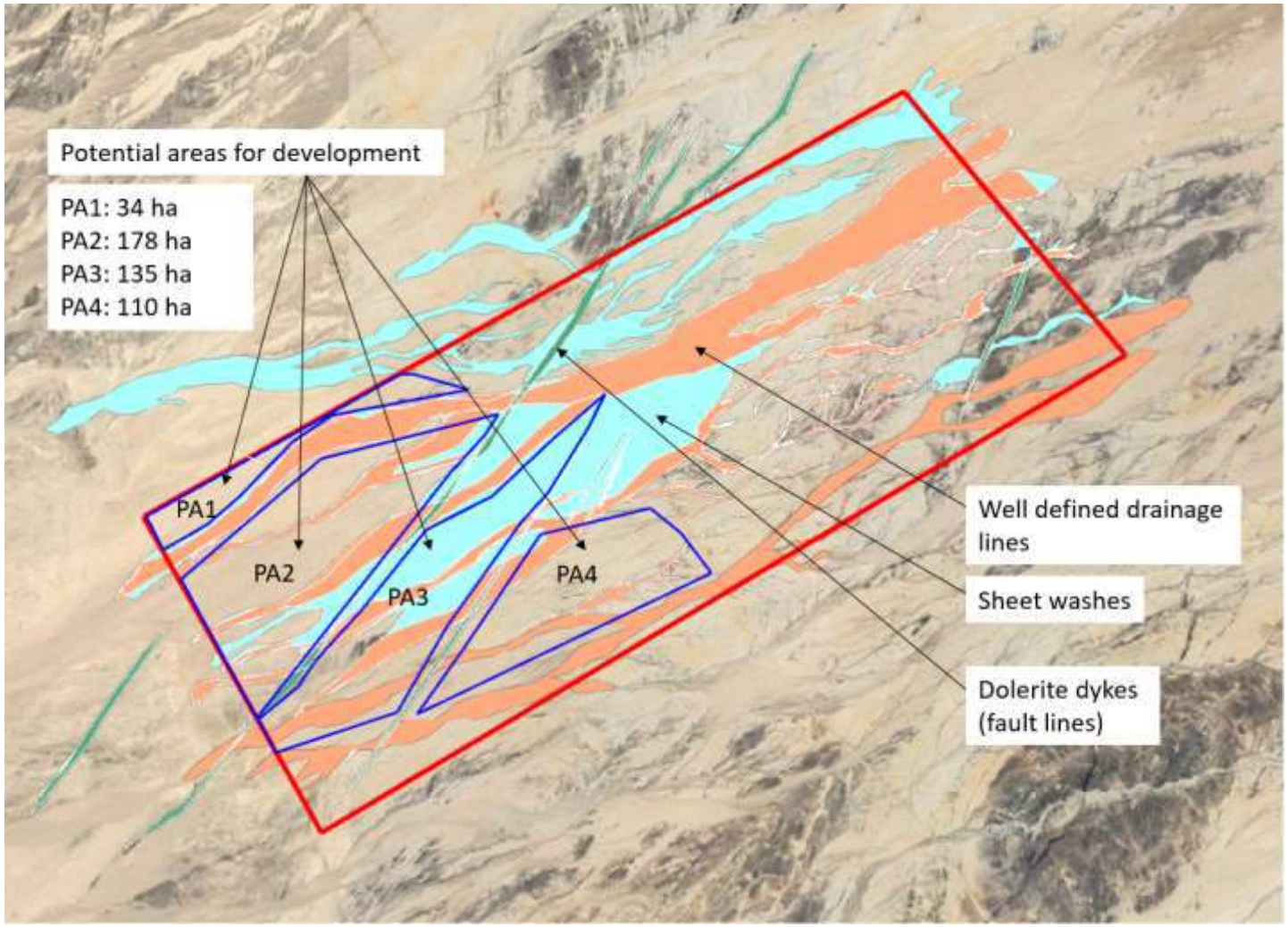


**Figure 5-2: Potential areas most suitable for the development of a general and hazardous waste treatment and disposal facility**

(Source Technical Feasibility Study (SLR, 2023))

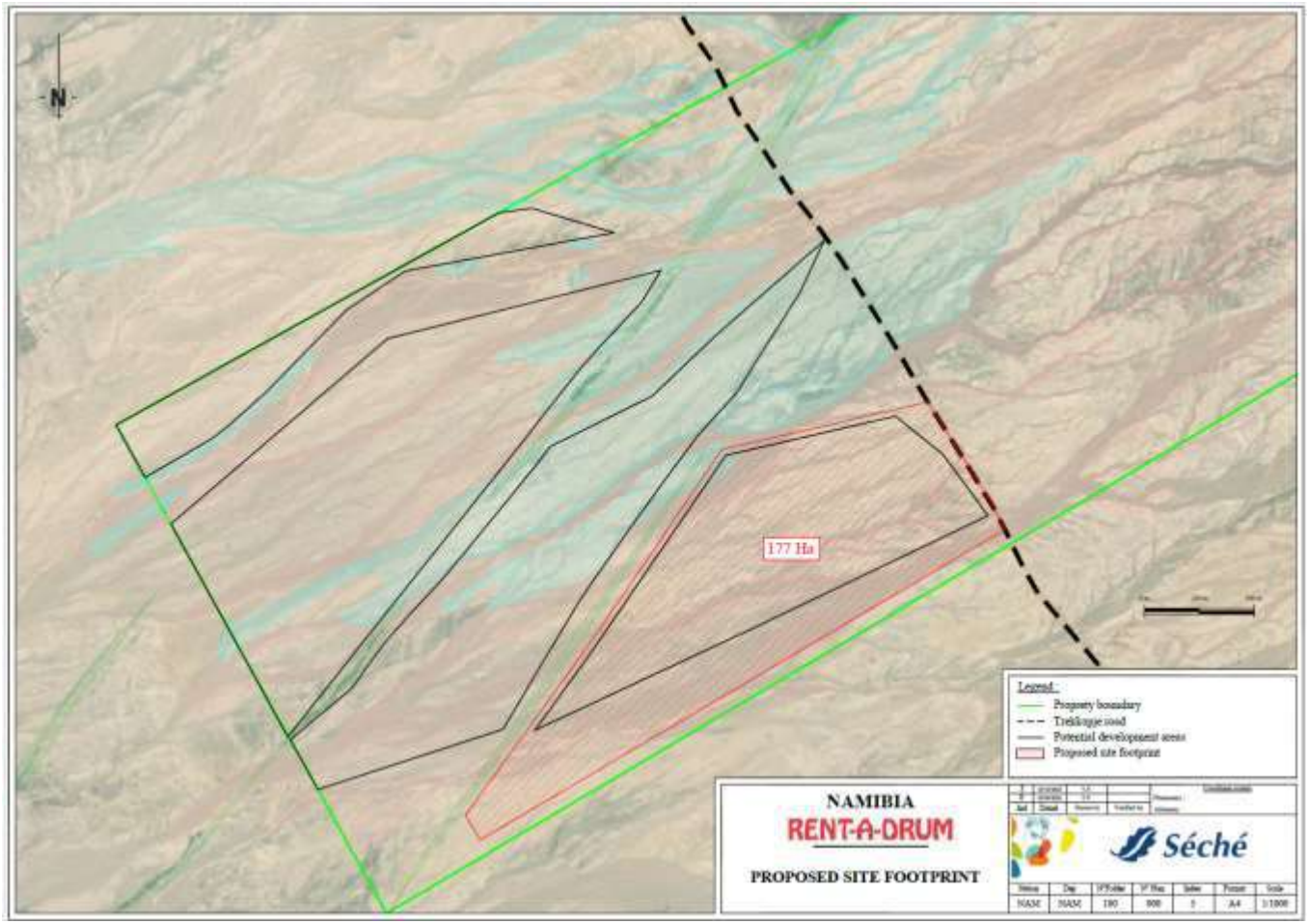


**Figure 5-3: Proposed NMF footprint**

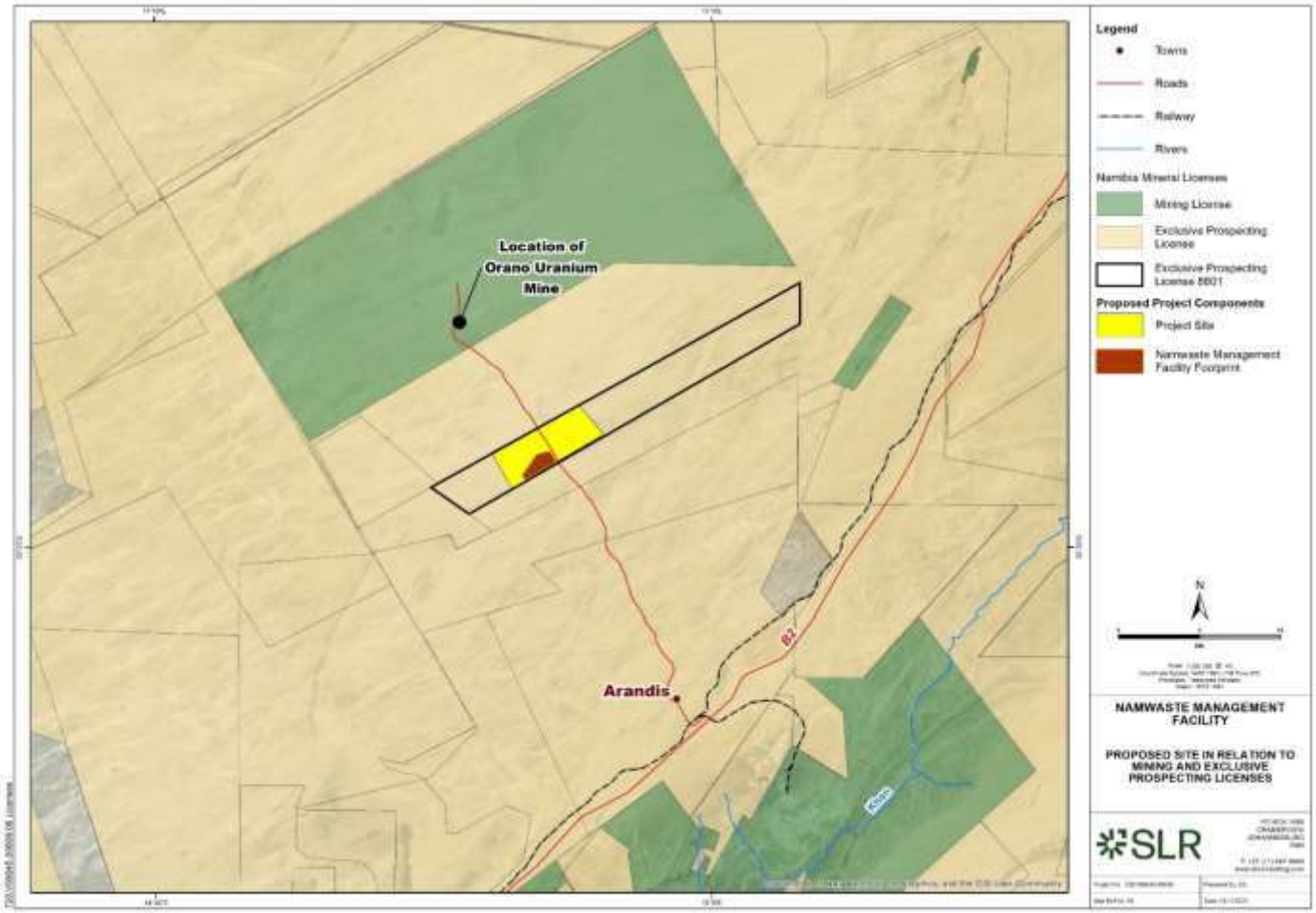


**Figure 5-4: Mineral Licences in relation to the Project site**

## 5.4 Project Components

The NMF will include waste treatment and disposal facilities as well as all required ancillary infrastructure. The main project components are listed below:

- Landfill, developed in phases for disposal of:
  - General and hazardous solid and (pre-treated) liquid waste;
  - Arsenic waste.
- General and hazardous waste treatment facilities:
  - Warehouse with a concrete slab for off-loading of arsenic waste in bulk bags;
  - 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);
  - Landfill leachate collection and containment in dedicated, lined leachate containment dams;
  - Stormwater/ run-off management infrastructure for collection and containment of any contaminated water in dams;
  - V-drain around the upstream side of the site to divert clean stormwater off site;
  - Laboratory to test and verify the make-up of incoming and/or treated waste as required;
- Ancillary Infrastructure:
  - Access road (~8 m wide) from the entrance of the industrial area of Arandis to Trekkopje Road (~3.3 km) or from the proposed alternative access off the B2 to the Trekkopje Road (4.8 km) to allow trucks to bypass the town of Arandis;
  - Access control facilities including perimeter fencing;
  - Weighbridges and control room;
  - Internal roads;
  - 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;
  - Workshop;
  - Electrical supply (estimated 350 kVA) and substation connected to nearest supply in Arandis (approximately 15 km);
  - Bulk water supply pipeline to convey water to the site from the Orano desalination plant. The pipeline will extend from the existing pipeline at the Orano Uranium Mine to the site (approximately 20 km). Daily water consumption is estimated to be 150 $m^3$ per day;
  - Water pump station at the Orano Uranium Mine and 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;
  - Office block;
  - Parking area;
  - Staff dining and ablution facilities;
  - Package sewage plant (all sewage generated on the site will be treated on site); and
  - Air quality monitoring station (if required).

The listed activities in terms of the EIA regulations of 2012 that are triggered by the proposed project are outlined in section 2.2.4 in Table 2-1.

### 5.4.1 Waste Treatment Facility

The waste treatment facility will allow for the treatment of waste prior to disposal thereof to landfill. The facility will have a roofed, impermeable and bunded operational area of approximately 3500 $m^2$ and will be able to treat up to 500 tonnes of waste per day. The average tonnage to be treated per day will be approximately 100 tonnes.

The treatment will involve a variety of processes, which will take place in a series of specially constructed lined and bunded treatment bays. The processes are aimed at achieving:

- pH modification / correction and chemical stabilisation of leachable contaminant concentrations;
- Micro-encapsulation through treatment with agents with cementitious properties;
- Moisture correction through chemical reaction with materials with absorbent properties;
- Contaminant toxicity reduction through addition of suitable agents/chemicals.

All treatment methods and procedures will be predetermined by the internal Technical Services Department and will be implemented by on-site staff as directed by the Technical Services Acceptance Sheet (TSAS).

The treatment facility will consist of a pre-treatment storage area, two waste treatment areas and a post-treatment storage area.

The details of the two waste treatment areas are as follows:

- Treatment Area 1:
    - Incoming waste which requires pre-treatment will be off-loaded into appropriately lined concrete bays. The required treatment agents will be added to the bays as per the predetermined treatment method on the TSAS. An excavator will then be used to mix the contents of the bays. Once treatment has taken place, a sample will be taken and analyzed to confirm that the treatment has been effective. If the treatment has not been successful, the waste will be retreated.
- Treatment Area 2:
    - Incoming waste will be deposited in the pre-treatment storage area. A front-end loader (FEL) will be used to feed the waste into a hopper, which will feed the waste onto a conveyer. The conveyer will feed a waste mixer. Treatment agents will be added to the waste mixer from storage silos as per the predetermined treatment method on the TSAS. Once treatment has taken place, a sample will be taken and analyzed to confirm that the treatment has been effective. If the treatment has not been successful, the waste will be retreated.

After treatment, the treated waste will either be collected by third parties as recovered raw material for their processes or will be sent to the on-site disposal facility.

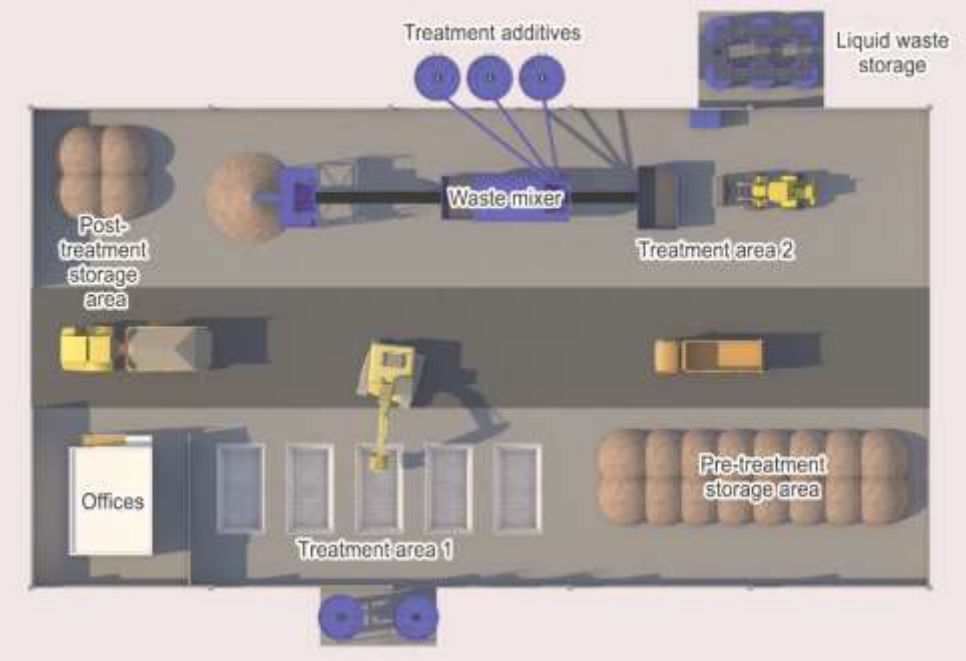


**Figure 5-5: Conceptual layout of the waste treatment facility**

### 5.4.2 Waste disposal facility and ancillary infrastructure

The waste disposal facility will receive approximately 600 tonnes of waste per day (including treatment additives). The facility will accept mainly hazardous waste, but general waste will also be accepted for disposal and will have a containment barrier equivalent in performance to the South African Class A containment barrier standard in line with the *National Norms and Standards for Disposal of Waste to Landfill (GN 636, 2013).* The standard design of a Class A containment barrier as per GN 636 is shown in Figure 5-6 below. The maximum outflow rate of the containment barrier will be $10^{-9}$m/s.

(a) Class A Landfill:

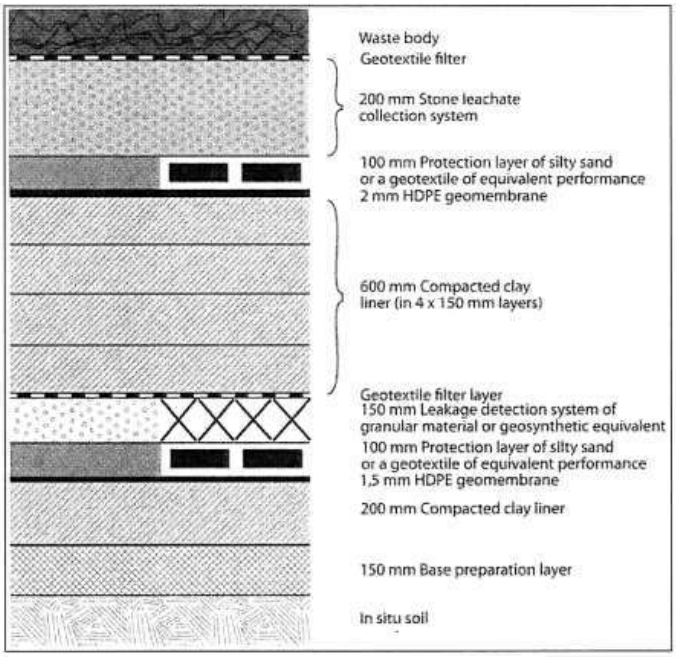


**Figure 5-6: Standard containment barrier design of a Class A containment barrier in terms of the Norms & Standards for the Disposal of Waste to Landfill (GNR 636 of 2013)**

The waste disposal facility will provide an estimated 25 million $m^3$ of airspace for an estimated period of 150 years, subject to market fluctuations. The facility will thus offer a long-term sustainable solution which will have capacity to support Namibia's economic growth. Should alternative technologies to landfill disposal become available in future, the footprint currently allocated to cell development could be used for development of the infrastructure required for the new technology. The facility will be developed systematically. Cells (areas that are excavated and lined with an appropriate containment barrier to receive waste) with volumes of approximately 160 000 $m^3$ per cell will be constructed sequentially to make up phases (Phase 1 and 2) and sub-phases (Phase 1A, Phase 1B, Phase 2A, Phase 2B and Phase 2C) as indicated in the Cell Development Plan (Figure 5-7) and Phase 1A Cell Development Plan (Figure 5-8). Cells will be excavated to a maximum depth of approximately 3 m and the final height of the landform will be 25 m from natural ground level (NGL). Waste to be disposed at the waste disposal facility will be directed to the active cell while the next cell is prepared by excavating, shaping and constructing the containment barrier to receive waste.

For Business Case 1, each cell will consist of two sub-cells, separated by a berm (hydraulic barrier). The first sub-cell will be used for the disposal of arsenic waste and the second sub-cell will be used for the disposal of general and other hazardous waste. Each sub-cell will have its own leachate management system as explained in Section 5.4.5. Two distinct landfilling methods will be implemented in the arsenic waste disposal sub-cell and the sub-cell used for disposal of general and other hazardous waste as explained in the following sections. In Business case 2 the cells would not be subdivided with the hydraulic barrier and there would be a single leachate management system.

Cells will be capped and rehabilitated once complete. A typical capping system is shown in Figure 5-9. The capping system will however be designed in the context of the desert environment and may not include a hydroseeded layer.

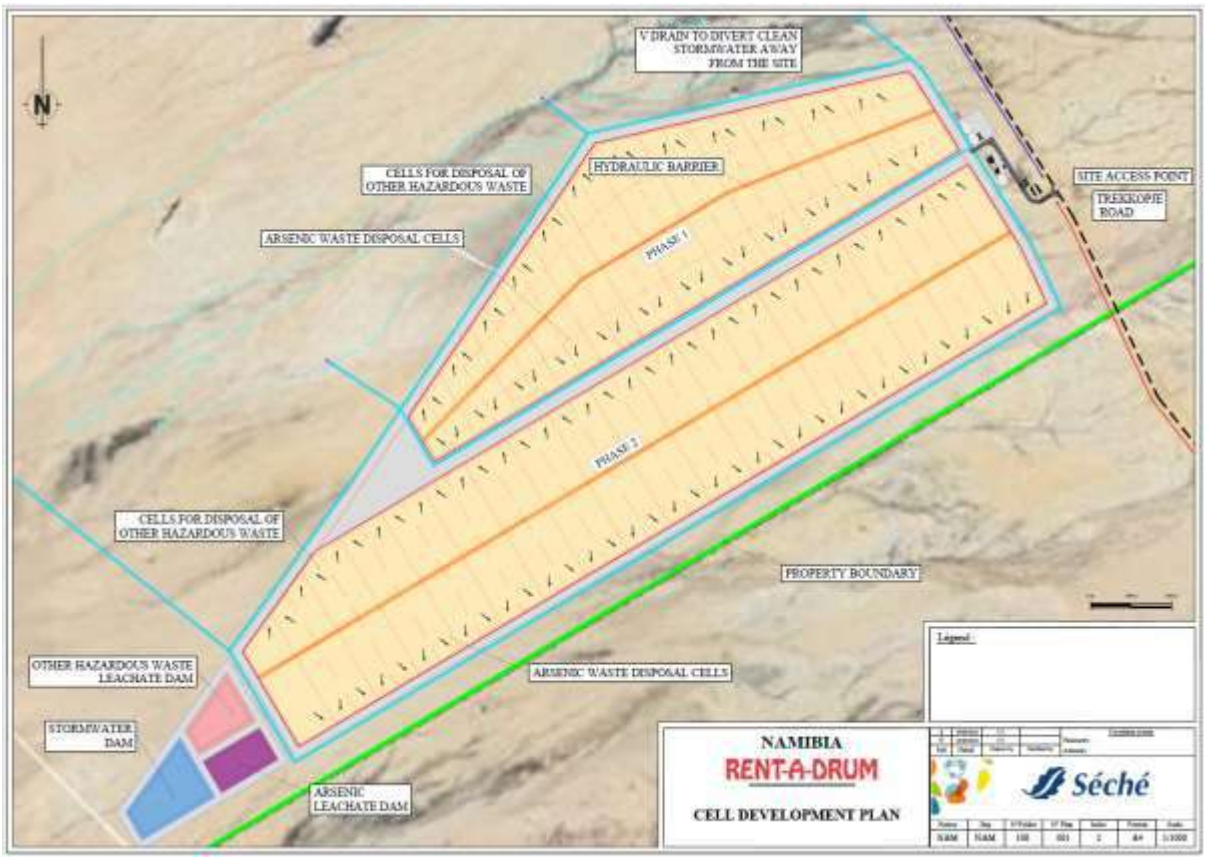


**Figure 5-7: Cell development plan**

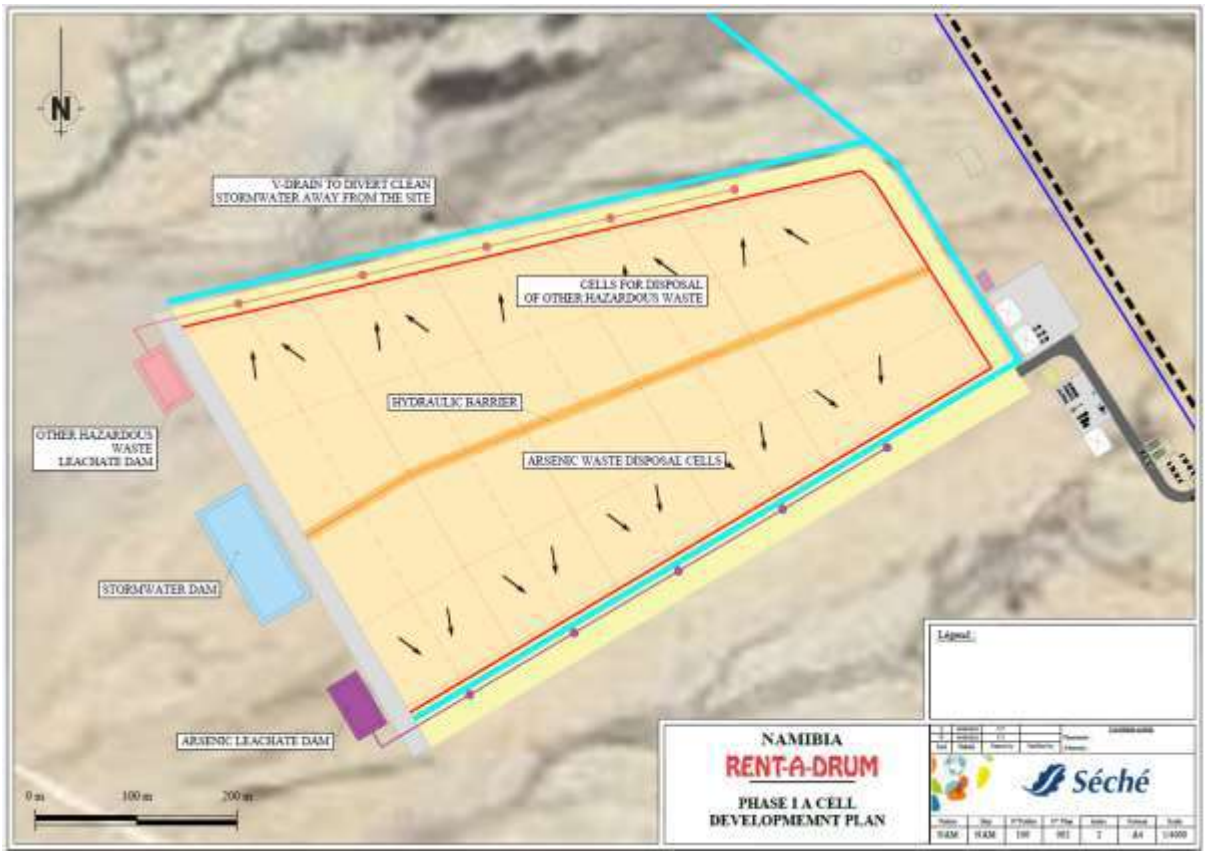


**Figure 5-8: Phase 1A cell development plan for Business Case 1**


**Figure 5-9: Typical capping system**

### 5.4.3 Landfilling method to be applied in arsenic waste disposal sub-cells

Assuming Business Case 1, the arsenic waste will be pre-packaged into waterproof big bags, such as UN13H3/Y big bags, shown in Figure 5-10 below, at the point of generation. These big bags have been designed for handling solid hazardous products (such as asbestos containing waste). The bags will then be sealed as shown in Figure 5-11 and will be reinforced with the use of adhesive tape. In addition, this step will include labelling each bag to identify

its contents and to allow for the bag to be traced. The sealed bags will be secured on pallets and will be transported to the disposal facility on trucks.


**Figure 5-10: Example of an UN13H3/Y big bag**

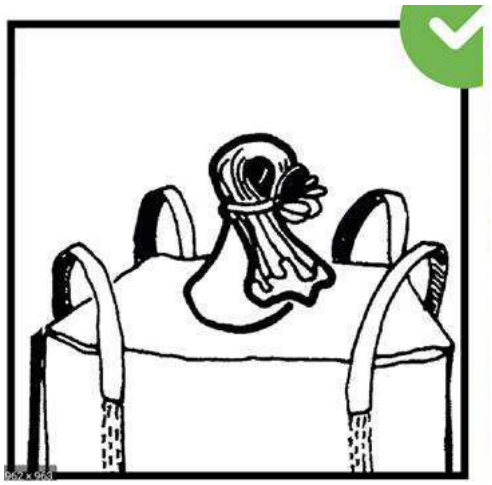

**Figure 5-11: Big bag sealing method**

Upon arrival at the NMF, the pallets containing the big bags will be offloaded in a warehouse with a concrete slab. A lowbed truck will be used to transport the big bags to the active arsenic waste disposal sub-cell. The big bags will then be packed in double layers, as shown in Figure 5-12 below. The gaps between the bags will then be filled with sand (sourced from cell excavations) during disposal (Figure 5-13).

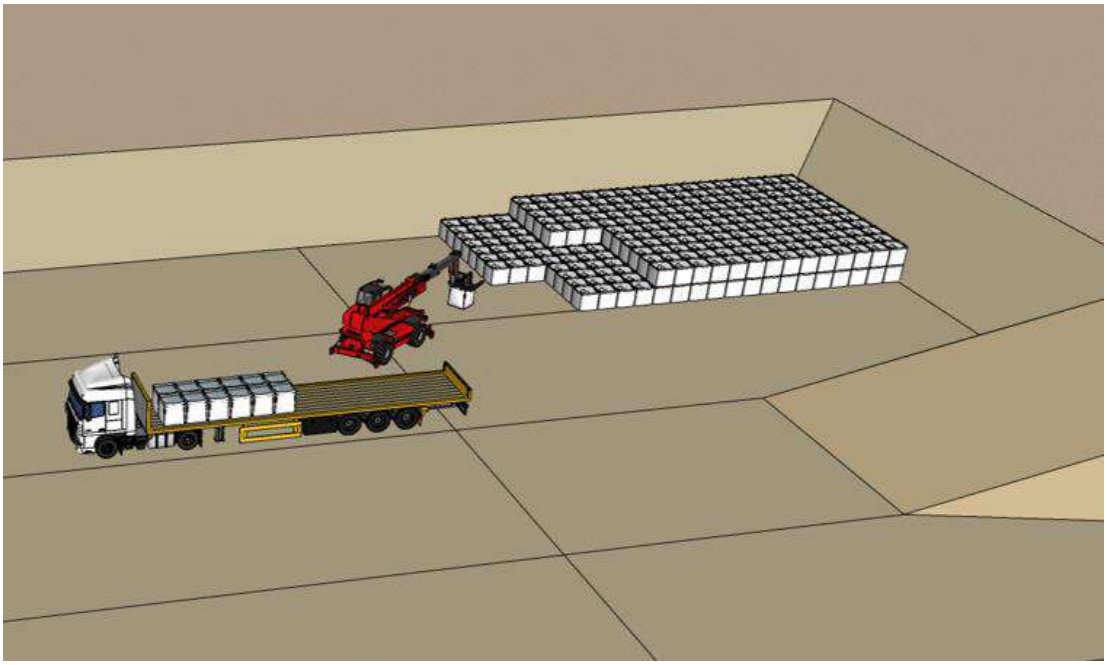

**Figure 5-12: Placement of big bags in double layers.**

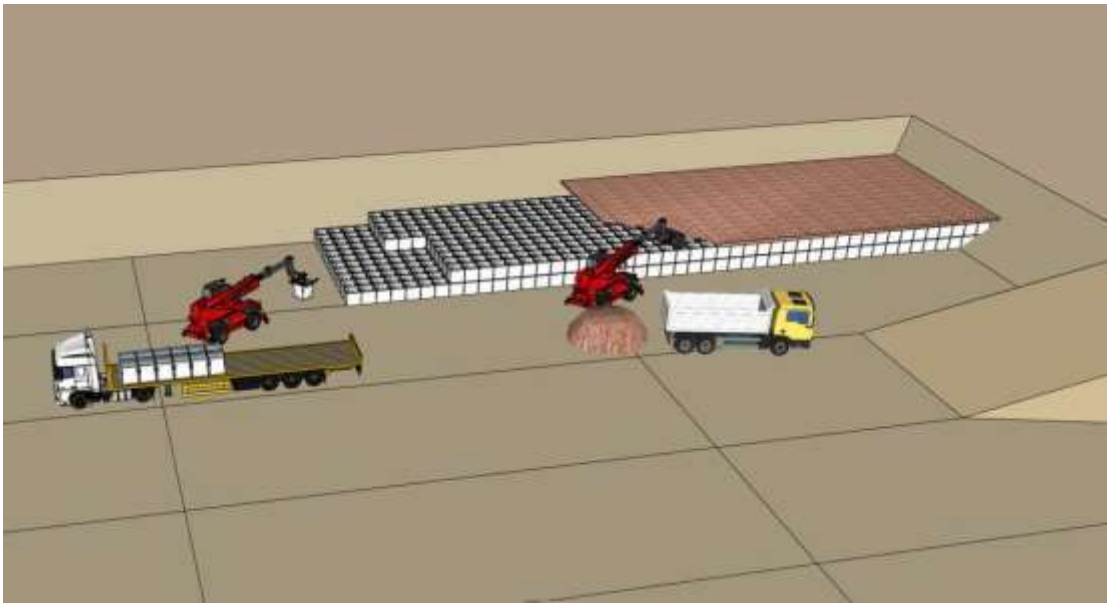

**Figure 5-13: Filling of gaps between the big bags using sand.**

Cement will then be used as intermediate cover between each double layer of bags (Figure 5-14). This will provide a solid surface on which equipment can drive to place subsequent layers of bags without risking damage to the bags which have already been placed in the cell. The cement layer will also act as an additional layer which reduces permeability of the cell.

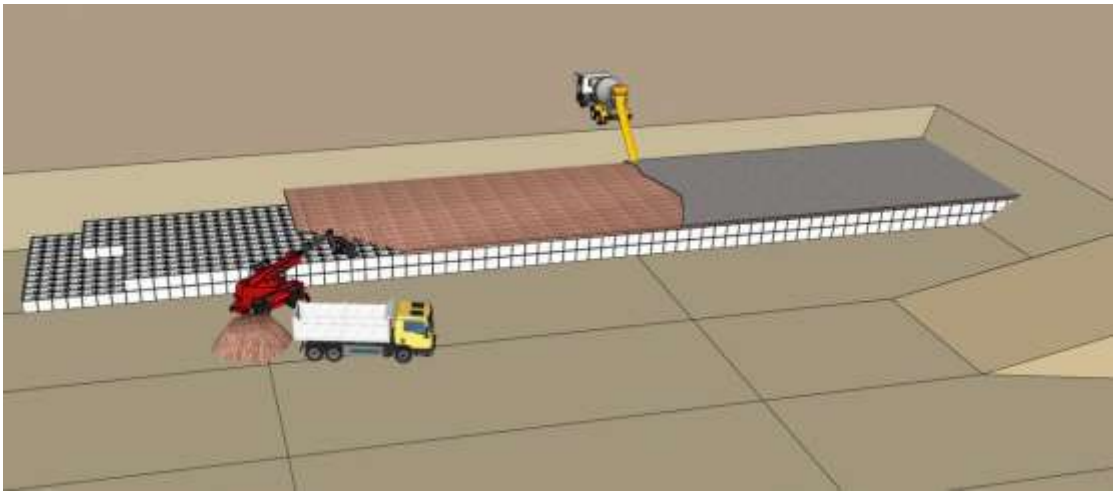

**Figure 5-14: Intermediate cover using a cementitious material.**

Once a sub-cell has been filled, a geomembrane will be placed on the top of the cell and will be welded to the geomembrane which forms part of the containment barrier, effectively sealing the cell and further increasing its permeability. The containment of the waste in big bags will prevent direct contact between the raw waste and the cementitious material, preventing any chemical reactions from taking place. The disposal of the waste in a low permeability cell and in an arid environment would ultimately mitigate the potential risk of ground water contamination.

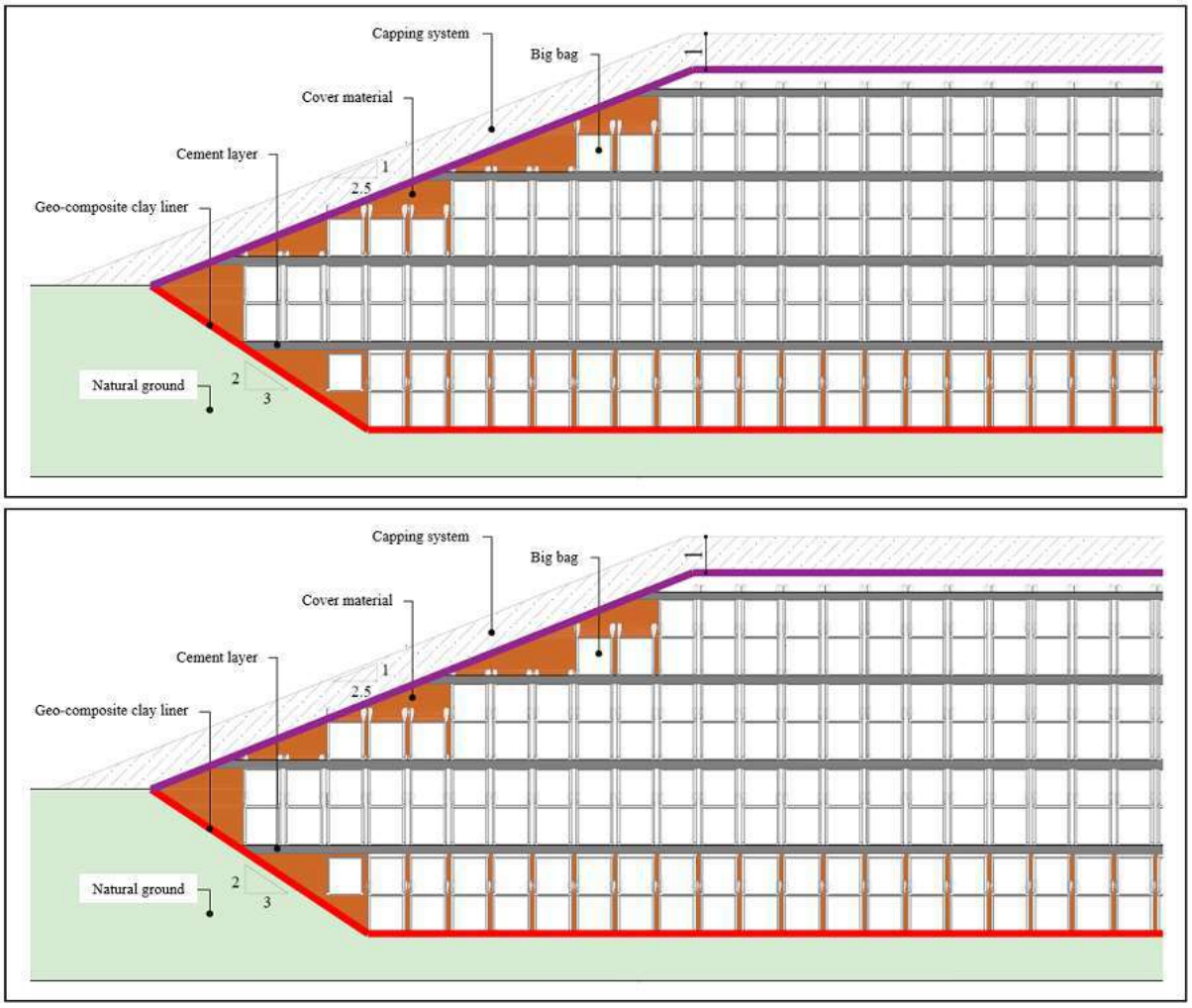


**Figure 5-15: Complete arsenic cell with containment barrier and capping system.**

### 5.4.4 Landfilling methods to be applied in sub-cells for disposal of general and other hazardous waste

General and hazardous wastes will be accepted under both Business Case 1 and 2. Depending on the nature of the waste, the waste may require pre-treatment prior to disposal. In such cases the waste will be received at the waste treatment facility. If no pre-treatment is required, the waste will be disposed directly into the active sub-cell for the disposal of general and other hazardous waste.

Waste received on the landfill will be deposited in horizontal layers approximately 0.5m thick and will be compacted continuously. Where necessary, cover material (soil from excavations on the disposal footprint) will be applied at a thickness of around 100 – 150 mm to prevent dispersion of the waste through wind, breeding of vectors and rodents and malodours. Intermediate cover shall be placed at a thickness of 300 mm on cells which will be capped once phases are complete.

### 5.4.5 Radioactive waste

Namwaste has elected not to include the disposal of radioactive waste at the NMF in the current application. This may be revisited in future.

### 5.4.6 Leachate collection and containment systems

It is not anticipated that large quantities of leachate will be generated by the facility due to its location in a hyper-arid area. However, provision will be made for leachate management. Assuming Business Case 1, each sub-cell will have its own leachate drainage network, to ensure that leachate potentially containing arsenic is handled separately from leachate generated by general and other hazardous waste. Each sub-phase of cells will therefore be designed with two leachate containment facilities, one for the containment of leachate from the arsenic waste disposal sub-cells and the other for the containment of leachate from the sub-cells used for disposal of general and other hazardous waste. Under Business Case 2, there would be a single leachate drainage network and containment facility per cell. The leachate containment facilities will be sized with capacity sufficient for 1:50 year storm events, to be determined during design.

Once sub-phases are complete, the associated leachate containment facilities will be decommissioned and the leachate will be directed to the new leachate containment facilities of the next sub-phase.

### 5.4.7 Stormwater management infrastructure

A v-drain will be constructed on the upstream boundary of the site to divert clean water away from the site. The sizing of the drainage system will be reviewed in the hydrological study.

Due to the site being located in a hyper arid area, no significant runoff from the active waste disposal area is expected. As such, runoff will be contained within the lined area of the cells by berms and will be diverted into the leachate management systems of the disposal cells. A stormwater dam for storage of potentially contaminated runoff from the remainder of the site footprint (internal roads etc.) will be constructed for each sub-phase. The sizing of the dams will be reviewed in the hydrological study. Contaminated runoff will be directed to the dam by v-drains. The v-drains will be concreted in line with the phased development of the landfill. Once sub-phases are complete, the associated stormwater dam will be decommissioned and the stormwater will be directed to the new stormwater dam of the next sub-phase.

The following water management measures will be implemented on the site:

- Installation of a network of background (upstream) and detection (downstream) boreholes for groundwater quality monitoring purposes in line with authorisation requirements as determined by the Competent Authority.
- Monitoring of surface and ground water quality in line with authorisation requirements as determined by the Competent Authority.
- Immediate removal of all waste spillages along roads within the site followed by appropriate treatment or disposal.
- Spill kits will be available on site to contain and rehabilitate spillages on site.
- All contaminated soil at any spills, will be collected, treated if required, and then disposed of responsibly.
- Diesel, fuel, and oil will be stored in tanks kept within bund walls to contain spills. The volume within the bund walls must be able to contain at least 110% of the maximum contents of the tanks. Where more than one container or tank is stored, the bund must be capable of storing at least 110% of the largest tank or 25% of the total storage capacity, whichever is greater.

- Wash bays and workshop run-off will be contained on site and will be accommodated in the site's potentially contaminated water management system or will alternatively be treated in the waste treatment facility prior to disposal to landfill.

### 5.4.8 Site Access

Due to the nature of the waste which will be transported to the facility and the nature of the vehicles which will be transporting the waste, it is necessary to develop an alternative access road to bypass the town of Arandis and link to the existing Trekkopje Road.

The Arandis Town Council is proposing to develop an alternative access to the Arandis Industrial Area off the B2 highway and to extend the road to link to the existing Trekkopje Road. The proposed route is shown in pink in Figure 5-16 below. If constructed, it will be approximately 4.8 km long and includes a level crossing over the railway line. The project has however not yet been approved and the timelines for completion of the project are unclear.

Namwaste is proposing, as a short term solution, to enter into discussions with the Arandis Town Council to develop a part of the road proposed by the Town Council, with an alternative access point as shown in yellow on Figure 5-16 below. The road will be approximately 3.3 km long and 8 m wide.

In the short term, the route which will be followed by vehicles delivering construction materials and waste to the facility, up to the point where it joins the Trekkopje Road, is shown in pink in Figure 5-17 below. In the long term, the traffic bound for the project site could be diverted to make use of the proposed new access off the B2 (blue route).

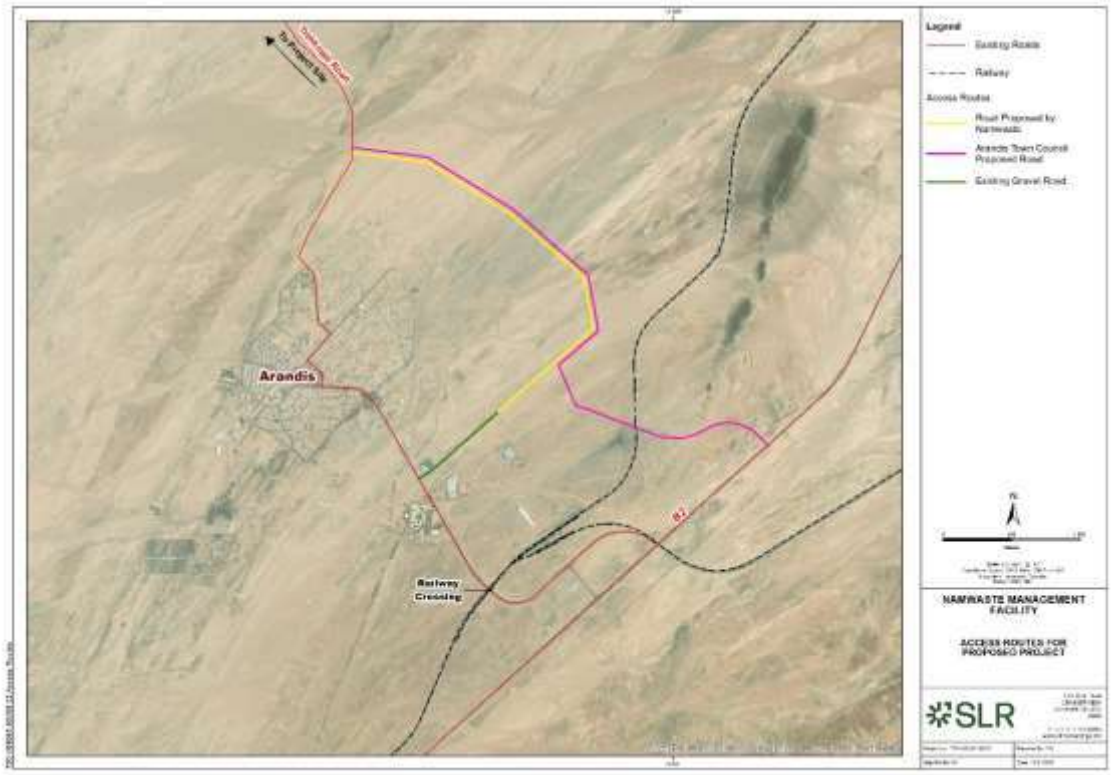


**Figure 5-16: Access routes proposed for the Project**

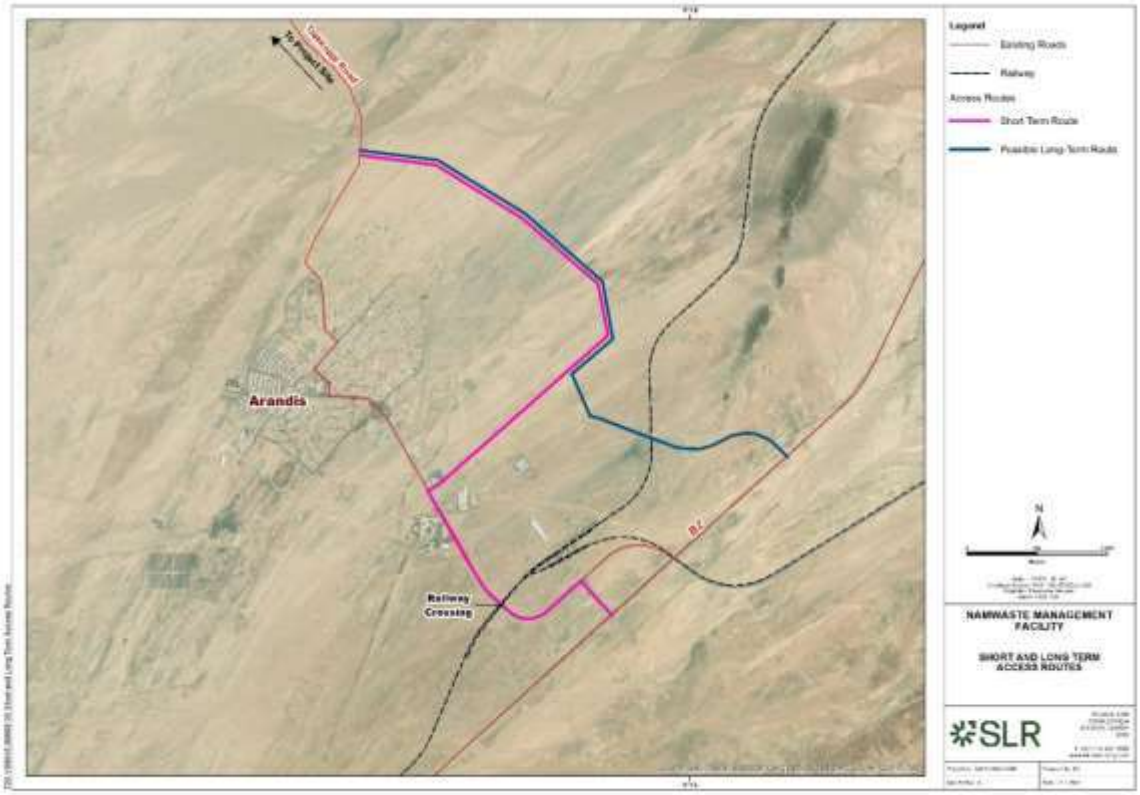


**Figure 5-17: Short- and long- term routes to be used during construction and operations**

### 5.4.9 Water Supply Infrastructure

The site will require approximately 150 $m^3$ of water per day. A bulk water supply pipeline will be constructed to convey water to the site from the Orano desalination plant. The conceptual routing for the pipeline, extending from the existing reservoir at the Orano Uranium Mine to the project site (approximately 20 km) is shown in Figure 5-18 below. The water will be pumped into two (2) JOJO type tanks on-site storages, with 30 $m^3$ capacity each at the NMF. The on-site storages and water pump station will be located near the receiving end of the water pipeline, marked as water station in Figure 5-19. The water will be used for dust suppression, waste treatment, vehicle washing, supply to offices and ablutions.

During the initial stages of the project, water trucks may be used to bring water from Orano Uranium Mine to the site, for construction and phase 1 operation. It is presumed that the trucks with a capacity of 10 $m^3$ will be used, and the number of trucks will determine the number of the trips per day (i.e., if one (1) truck is used, that truck will make 15 return trips per day to supply the required amount of water (150$m^3$) per day).

Namwaste is also considering sourcing groundwater from the site as an additional source of water. Further considerations are needed to determine the use of local groundwater as a water supply option during construction and operation.

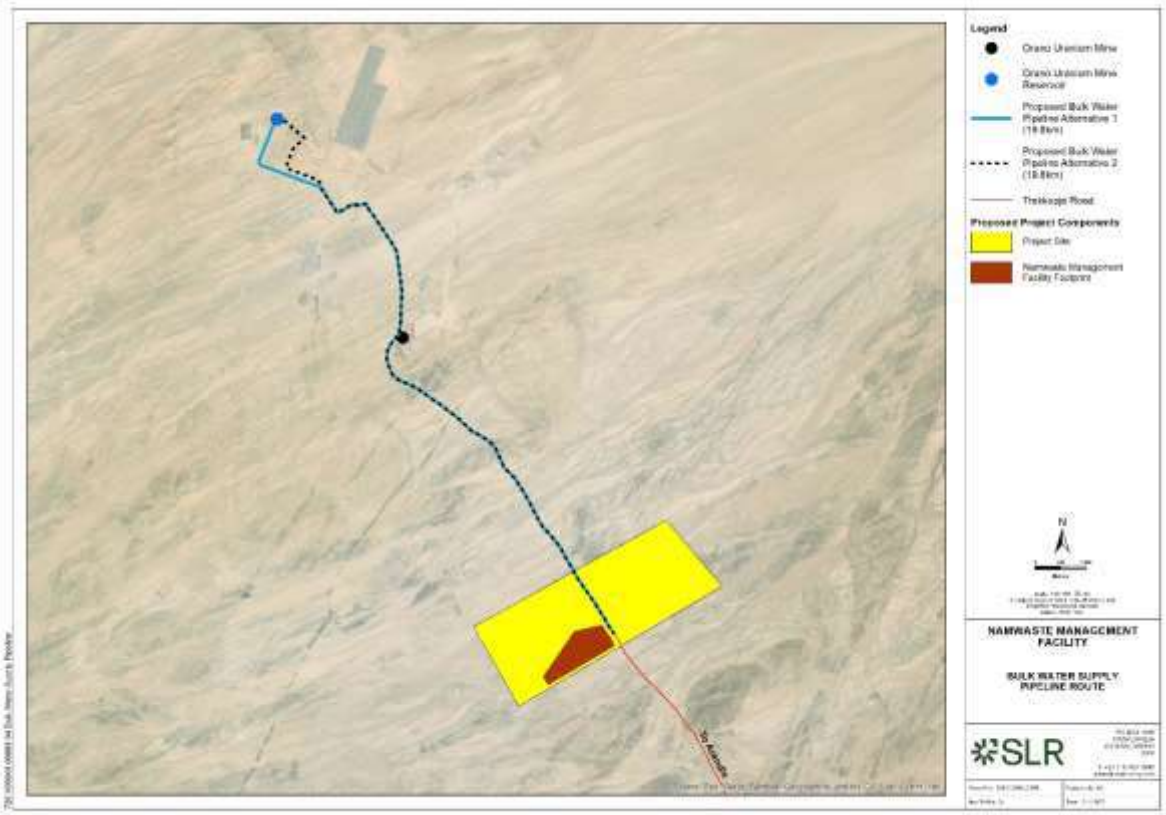


**Figure 5-18: Conceptual bulk water supply pipeline route**

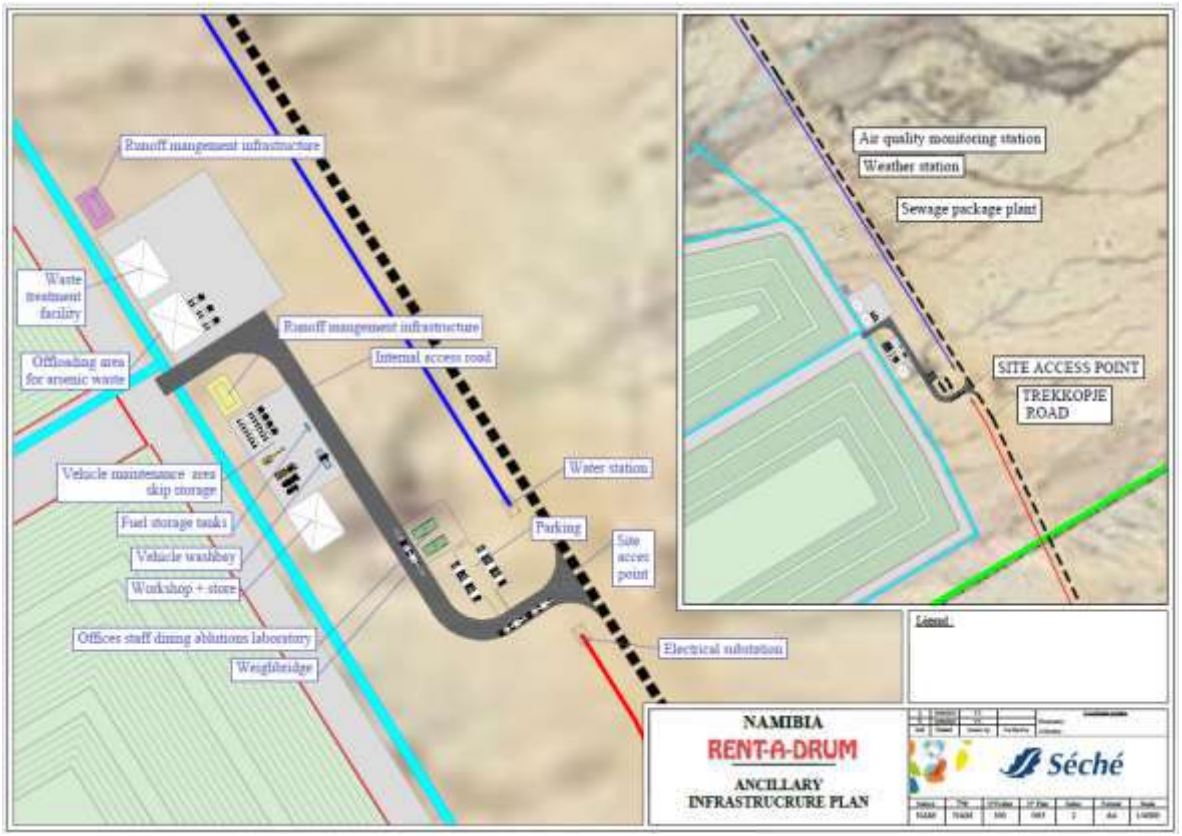


**Figure 5-19: Conceptual bulk water pump station and on-site water storage**

### 5.4.10 Electrical Supply Infrastructure

The site will require a substation with a capacity of approximately 350 kVA. The conceptual routing for the electrical supply, extending from the nearest supply in Arandis to the on-site substation (approximately 17 km), is shown in Figure 5-20 below.

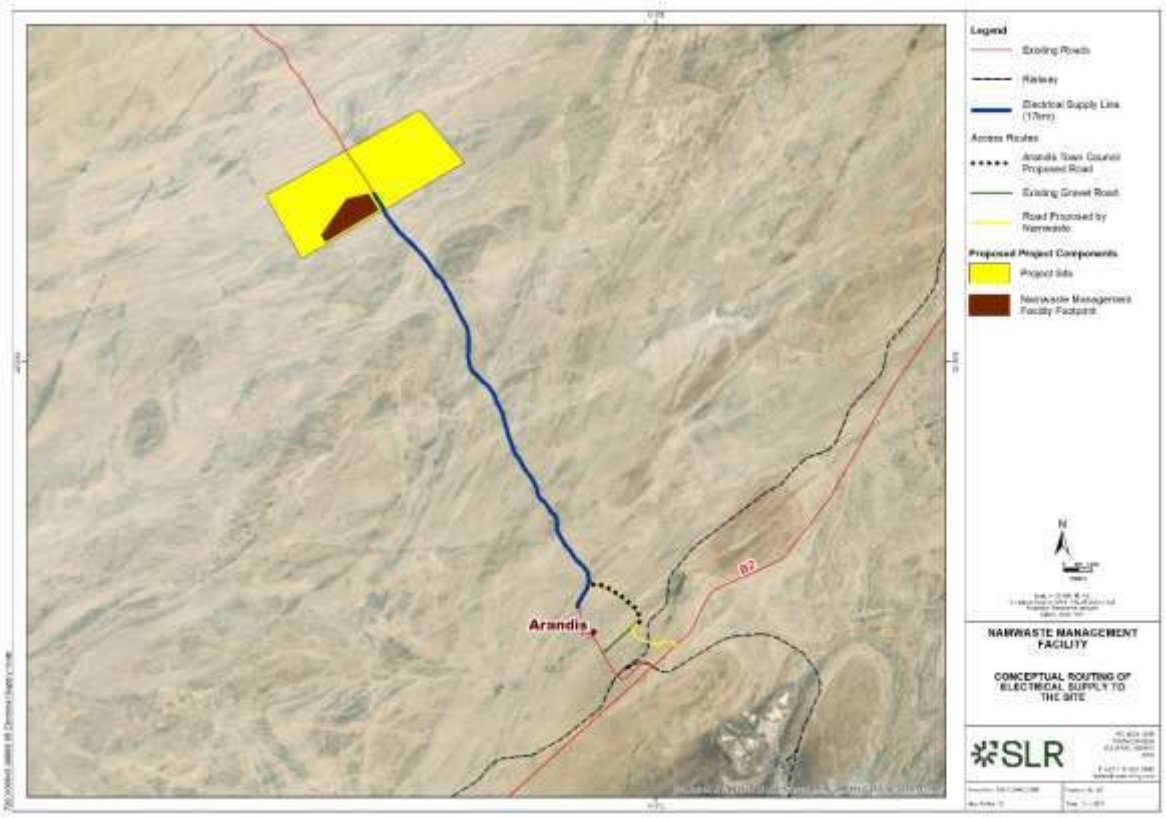


**Figure 5-20: Conceptual routing of electrical supply to the site**

## 5.5 Construction Phase Activities

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.

The common, shared infrastructure will be developed as and where required to ensure accessibility and functionality of the site. This is likely to include internal roads, electricity and water 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 facilities are phased and the later phases will only be developed as and when required. Such as the construction of the disposal sites which will be implemented in phases with each waste cell being developed as the demand for waste disposal capacity requires.

### 5.5.1 Construction phase access routes, water and electrical supply

During construction, water trucks may be used to bring water from Orano Uranium Mine to the site. It is presumed that the trucks with a capacity of 10 $m^3$ will be used, and the number of the trucks will determine the number of the trips per day based on the volume of water required per day during construction.

The Project site currently does not have an electricity supply. A diesel generator will be the source of electricity for site establishment offices and construction requirements.

The short-term access route which will be followed by vehicles delivering construction materials is shown in blue in Figure 5-17.

## 5.6 Operations and Maintenance Phase

### 5.6.1 Operating hours, access control and security

The facility will be operational on weekdays (excluding public holidays), for 12 hours per day on average. Emergency spills and clean-ups may necessitate short periods of time during which the facility will be required to operate 24 hours per day.

It is envisaged that the existing security checkpoint, currently managed by the Orano Uranium Mine, could be taken over by Namwaste. The checkpoint is located approximately 1.2 km from the edge of Arandis on the Trekkopje Road. The project site is approximately 16 km from the existing security checkpoint. An additional security checkpoint will be located at the facility entrance, which will be used to control the movement of vehicles in and out of the facility at all times. A security system will be implemented with guards on duty 24 hours per day.

The facility will have a security fencing which will be completed in two (2) phases (i.e., phase 1 and 2). Phase 1 consists of fence with a 4 280m perimeter surrounding the Phase 1A cell development area, as depicted in Figure 5-21 (perimeter displayed in purple). Phase 2 will involve fencing the remaining area of the site footprint and further details will become available at a later stage. The fence will consist of 1.2m jackal wire fencing for animal intrusion (lower portion of the fence) and 0.9m barbed wire fencing for human intrusion (upper portion of the fence). The fence will be supported by the steel galvanised post set in concrete footing at approximately every 1m. The post footings (holes) are proposed to have a footprint of 0.3m x 0.3m (L x W) and 0.7m depth.

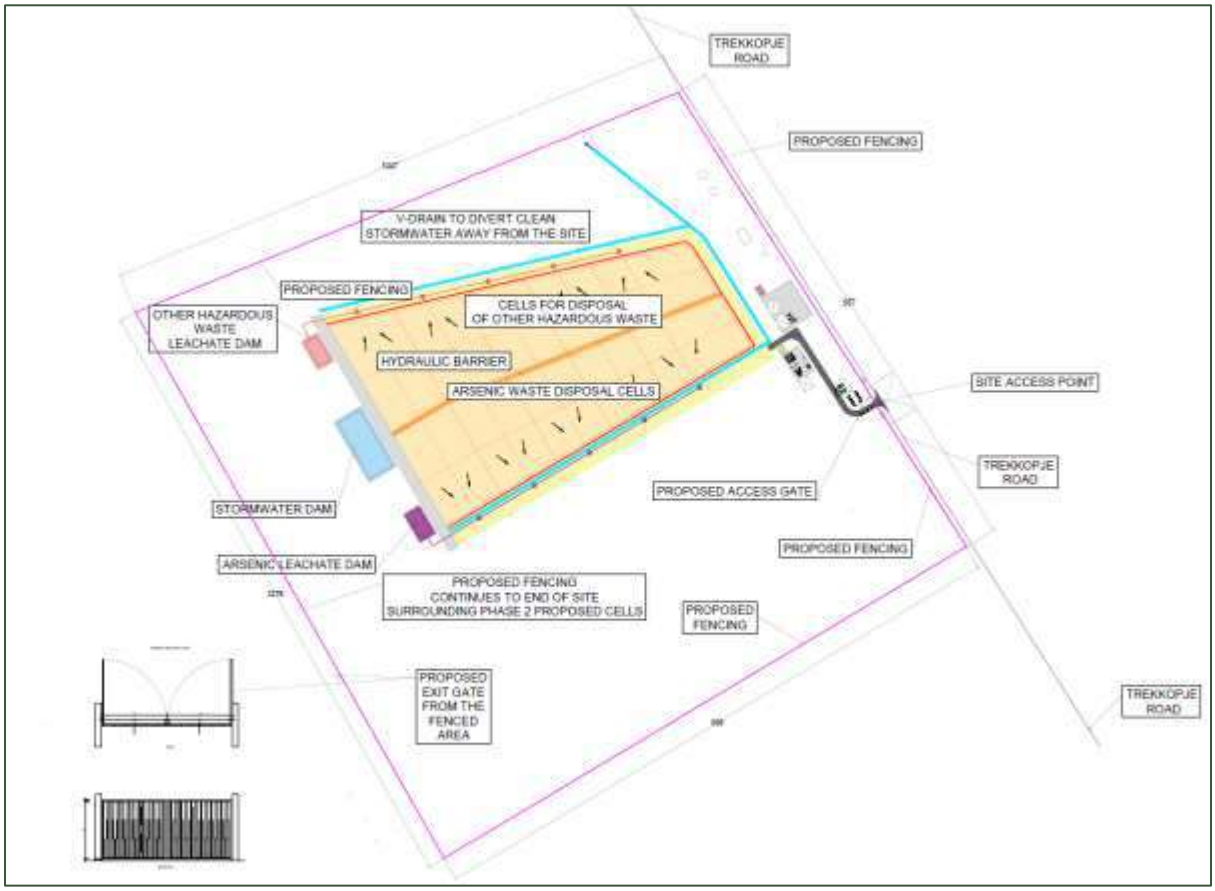


**Figure 5-21: Phase 1 perimeter fencing**

## 5.6.2 Waste acceptance procedure

### 5.6.2.1 Verification analysis

The Technical Services Department and Facility Manager will be responsible for ensuring that all waste loads which are sent to the facility can be treated and/or disposed at the facility in a legal manner. A Technical Services Acceptance Sheet (TSAS) will be prepared for each waste load before it can be booked for treatment or disposal at the facility which will describe the processes to be followed on site and will contain an overview of major hazards and precautions to be taken.

### 5.6.2.2 Operation of the weighbridge system

One 18-m steel-deck weighbridge will be installed at the entrance to the facility. This system will be used to record the mass of all waste loads delivered to the facility. Every vehicle carrying waste destined for treatment and/or disposal at the facility will be subjected to weighing before entering the facility and upon leaving the facility. To ensure that no data is lost as a result of damage to the weighbridge computer system, the weighbridge system will make daily backup files of all electronic data automatically, which will be stored on the server at the Head Office.

#### 5.6.2.3 Identification of disguised and illegal waste and rejection of waste

All arriving waste loads will be inspected by the Lab Technician and/or be subjected to verification analysis as described above for conformance to the TSAS which should accompany the load before it enters the facility. Arriving waste loads should be further evaluated in respect of wastes that are prohibited or restricted. Should there be no notable discrepancies or deviations from the aforementioned criteria, the load should be accepted for processing. If the load deviates from the aforementioned TSAS descriptors or a load is received in the absence of the appropriate booking or without the relevant documentation, this concern will be communicated to the Facility Manager. Such communication should at least include:

- a copy of the subject TSAS;
- a reference photograph of the waste of concern; and
- a non-conformance report with a written description of the subject deviations / concerns leading to potential rejection. Decisions on how to proceed with the management of the waste thereafter will be done in agreement between all concerned parties (i.e., Commercial Division, Facility Manager and the Technical Services Division). If the load is ultimately rejected from the facility –
    - The arrangements for any off-site management of the waste must be finalised as soon as is reasonably possible;
    - The arrangements proposed for the onward management of any rejected load must be communicated with the customer of concern;
    - Customers must approve any proposal for the onward management of their rejected waste; and
    - Customers must be provided with a reasonable indication of the factors that influenced the rejection of the load, as well as of the potential cost implications of any onward disposal / management thereof.

## 5.7 Decommissioning Phase

The waste disposal facility has been designed for a 150 year operational life, 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 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 final 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.

Further details regarding decommissioning are to be provided in the subsequent EIA phase.



## 5.8 Project Alternatives

This section has been compiled in compliance with Section 8(g) of the EIA Regulations. The aim of this Section is to detail and compare the environmental and social impacts and risks of the project alternatives for the purpose of selecting the preferred alternative(s).

### 5.8.1 Layout and design

The layout of the NMF and the design of the various facilities as currently presented is a conceptual plan and is subject to on-going adjustments in order to optimise the facility. The current layout has been informed by the findings of the Technical Feasibility Study (SLR, 2023). The proposed project footprint considered proximity to the existing Trekkopje road to avoid impacts related to establishment of a long access route. As a result, the site access point and facilities such as offices, parking, workshops, etc., are placed immediately off Trekkopje road which requires a short access route to the site.

Technical, financial and environmental considerations, as identified during the course of this assessment, will inform the final layout and design. The intent will be to arrive at a layout that provides for efficient and effective integrated waste management operations while minimising the environmental risks. Further information on the site layout and design alternatives will be provided once the environmental specialist studies have been undertaken. The final updated layout will be included in the EIA report. Where risks are identified the designs will be improved to provide adequate mitigation.

### 5.8.2 Alternative Sites

As part of the pre-feasibility studies Namwaste undertook a screening study to assess at a “high-level” two target areas suitable for the development of the Project. A high-level, desktop screening (Environmental Compliance Consultancy, August 2022) of a number of initial target areas against various criteria including environmental and social aspects, amongst others, was previously commissioned by the proponent. A site options assessment was conducted for the following six sites in the Erongo region:

- Stone Africa quarry, parcels 120 and 123, northwest of Rössing, east of the Dorob National Park;
- Second site option at Stone Africa quarry;
- Twin Hills northwest portion of the lease, outside of mine facilities;
- Trekkopje /Orano Uranium Mine south of the mining rights;
- Uis Tin Mine within the mined opencast footprint of ML 134; and
- Farm Vergenoeg.

The desk-based assessment (Environmental Compliance Consultancy, 2022), which included a site screening exercise and the appraisal of options, was guided by the following key considerations:

- The relevant waste licence application form.
- The ‘Minimum Requirements’ (DWAF, 1998) for the site selection of a landfill.
- Spatial criteria including economic, social, environmental and public acceptance, considering the following:
    - Proximity to railways, highways and main roads.
    - Presence of dolomite and potentially sensitive seismic zones.
    - Presence of an aquifer.

- Presence of wetlands, dams, pans and water courses.
- Dominant soil type.
- Protected and ecologically sensitive areas.
- Townlands, high population density, mineral reserves, and infrastructure.

Based on these findings, Namwaste selected two preferred target areas for further consideration as potential locations for the Project. The preferred targets which were identified were the Trekkopje and Vergenoeg target areas. Each area was approximately 2 000 ha in extent and both located in the Erongo region, between 50 and 80 km inland from Swakopmund, shown in Figure 5-22. These targets were subject to further investigation and screening via a Technical Feasibility Study (SLR, 2023)

The Technical Feasibility Study involved the screening and assessment of two ~2 000 ha areas of land to identify ~500 ha parcels of land (one on each target area) which could potentially be feasible for development as a general and hazardous waste management facility and be taken into the Scoping phase of the EIA application process. The Technical Feasibility Study included engineering, geotechnical and hydrogeological inputs, as well as further consideration of environmental and social aspects.

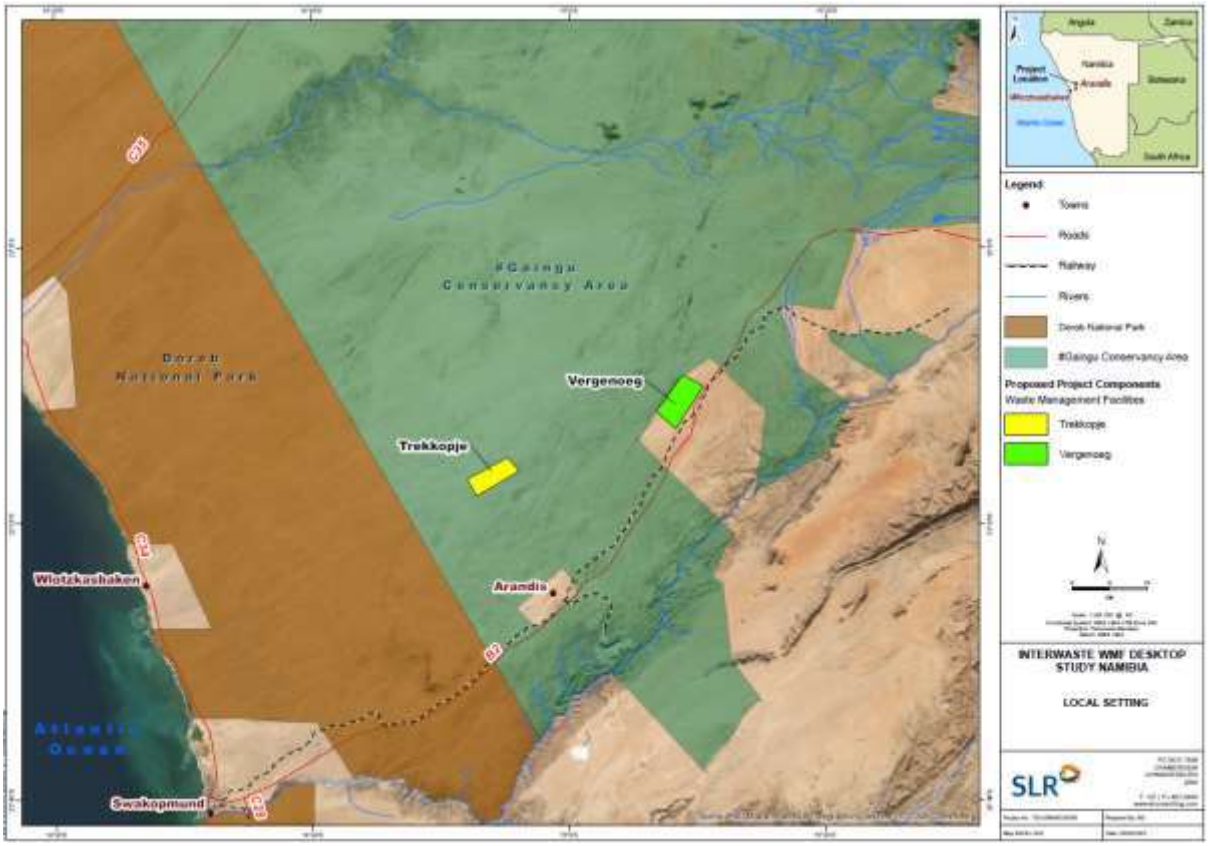


**Figure 5-22: Locality of two sites considered.**

The two target areas assessed in the Technical Feasibility Study are summarised the table below:

**Table 5-4: Summary of target areas assessed.**

| Target area name | Location | Land ownership | Mining/exploration |
|---|---|---|---|
| Trekkopje | Located ~50 km north-east of Swakopmund, ~15 km north-west of Arandis, along the Trekkopje Road, ~ 8 km south-east of the mine | Communal land – owned by the Namibian Government, and the !Oe-≠Gân Traditional Authority enjoys a "right of use" | No ML over the target area but there is an application for EPL 8801 (base and rare metals, dimension stone, industrial minerals, nuclear fuel minerals and precious metals) pending ECC |
| Vergenoeg | 75 km north-east of Swakopmund, ~20 km from the Trekkopje target area, adjacent to the B2 road (to the north of the road) | Private property (Vergenoeg Farm No 92) | No ML but there is an EPL for base and rare metals and EPL application for nuclear fuel minerals. |

The following section summarises the key findings of the Technical Feasibility Study and the aspects considered during the comparison of the two target areas resulting in the identification of the most feasible option between the two.

#### 5.8.2.1 Geotechnical

The following are key findings relating to the Trekkopje target in terms of geotechnical considerations:

- Apart from sporadic outcrop of schist, gneiss, dolerite, quartz vein, calc silicates and quartzite, the site is covered by a mantle of aeolian sand with a secondary alluvial influence evident as coarse gravel and cobble deposition. Calcrete development is also evident.
- Generally shallow TLB refusal at depths of between 1 and 2 m.
- Bedrock is weathered and highly fractured within the depths of test pit excavation. The ERT surveys infer these conditions to extend to depths of about 10 m, with a high degree of variability.
- There is a paucity of naturally occurring clayey materials across the site. Gravel materials occur in abundance.
- According to Kadiri *et al* (2023), the area has a low seismic hazard potential.

The geotechnical assessment of the Vergenoeg target was limited to a desk study level only as the site could not be accessed for reconnaissance and investigation purposes. It was noted that areas on the site, particularly the far north and southern portion, are underlain by calcareous rock types, which negatively influences the feasibility of the site for development as a waste management facility.

#### 5.8.2.2 Geohydrology

Consideration of information that distinguishes the two targets is tabulated in Table 5-5. Flaws and sensitivities relating to the Vergenoeg and Trekkopje targets are summarised in Table 5-6 and Table 5-7 respectively.

**Table 5-5: Target characterisation**

| Trekkopje Target | Vergenoeg Target |
|---|---|
| • Dykes cross-cut the site in a northeast-southwest orientation compartmentalising the site. They are part of the fractured aquifer and locally control groundwater flow.<br>• Marbles and other geological formation outcrop more on the eastern side of the site while the west has limited outcrops as sediments in the washes become relatively thicker and more widespread.<br>• The site is outside main strategic river catchments that are important for water supply for domestic, agriculture and/or other commercial uses.<br>• Surface water and groundwater flows westwards with no immediate downstream receptors (such as boreholes, settlements or farms). | • No dykes were identified within the site from satellite imagery.<br>• Local geological formations are expected to be more outcropping at the site.<br>• The site is underlain by Karibib Formation lithologies, whose marble aquifers are strategic aquifers in the east of the site where groundwater is relatively fresh.<br>• The site borders the Swakop-Khan River catchment divide with a small portion of the site falling within the catchment.<br>• Groundwater flow from the site is towards the catchment although it is expected to be predominantly westward towards Arandis. |

**Table 5-6: Flaws and sensitivities at Vergenoeg Target**

| Fatal flaw areas | Sensitivities | Preferred areas within the site |
|---|---|---|
| Exposed outcrop with faults presents preferential pathways for contaminants.<br>The site boarders the Swakop-Khan River catchment divide with a small portion of the site falling within the catchment. Therefore, groundwater flow from the site is towards the catchment; although it is expected to be predominantly westwards towards the town of Arandis.<br>Existing boreholes within farmland indicate use of groundwater for other purposes despite the perceived brackish nature of the aquifer. Knight Piesold (2022) accorded that the waste disposal site will need to be located away from the geological contact points where boreholes are located.<br>The presence of the Karibib marble on the site. | Presence of surface drains and washes that recharge the aquifers and sustain sensitive ecosystems.<br>The site is underlain by Karibib Formation lithologies, whose marbles are locally good yielding aquifers to the east of the site where groundwater is relatively fresh.<br>Location within farmland and proximity to the Swakop-Khan River Catchment means that the area may pose risk to surrounding areas. | No preferred site identified |

**Table 5-7: Flaws and sensitivities at Trekkopje**

| Fatal flaw areas on each site | Sensitivities of each site | Preferred areas of each site |
|---|---|---|
| Exposed outcrop on the eastern side with potential fractures/faults presents preferential pathway for contaminants.<br>Dykes that cut across the site are part of the fractured aquifer.<br>Presence of major surface drains and washes that recharge the fractured aquifer and shallow sediments that sustain sensitive ecosystems. | Active surface drains that recharge local aquifers and shallow sediments sustain sensitive ecosystems. | Four areas (PA1-PA4), to the west of the site/mine access road, were identified as shown in Figure 5-23. |

#### 5.8.2.3 Radiation

The baseline radiation doses elaborated for the Vergenoeg and Trekkopje targets are typical exposure doses for members of the public residing in Namibia's Erongo Region. No specific radiation-related risks were identified at the Vergenoeg or the Trekkopje targets. From a radiological risk perspective, neither Vergenoeg nor Trekkopje targets show fatal radiologically-relevant flaws.

Based on the radiological information used in the Screening Study Report, and a comparison of the radiological factors of relevance to actual and potential sensitive receptors in the area, the Trekkopje target area was identified as the preferred for a future waste disposal facility, as it is in a more remote area than the Vergenoeg target area. At the Vergenoeg site specific receptor sensitivities exist in terms of the target area's proximity to the highly frequented B2 highway, which is the major transport route connecting the towns of Swakopmund and Usakos.

#### 5.8.2.4 Engineering

**Trekkopje Target**

Based on the available information and assessment conducted in terms of engineering considerations, it can be concluded that:

- There were no fatal flaws identified that would render the target unsuitable for the construction of a WMF.
- The topography/slopes on the east of the target are less suitable and the area to the west of the Trekkopje Road contains the least risk when it comes to the slopes and stability of the facility.
- The western portions of the target contains some risk due to the presence of fault line/dyke(s); caution would be required during the design and construction phases. The landfill may also be constructed in two phases to avoid the major fault line/dyke(s).
- As sensitive ecological areas (drainages and outcrops) are present at the target site, the placement of the WMF would have a negative effect on these sensitive areas. This will need to be dealt with during the detailed design and permitting of the WMF to ensure minimal negative effect to the receiving environment.

The area to the west of the target area likely presents the least risk for the construction of the proposed WMF.

**Vergenoeg Target**

Based on the available information and assessment conducted in terms of engineering considerations, it can be concluded that:

- Areas on the target, particularly the southern portion, is underlain by calcareous rock types which increase the risk of constructing a landfill and should be avoided.
- Exposed outcrops with faults were identified on the target, extra caution would be required during the design and construction phases. The landfill may also be constructed in two phases to avoid the fault/dyke.
- As sensitive ecological areas (drainages and outcrops) are present at the target site, the placement of the WMF would have a negative effect on these sensitive areas.
- The target is close to the general public (via B2 road) and will likely require screening.
- There are potentially strategic aquifers in the east of the target where groundwater may be relatively fresh and need to be avoided.
- Further studies are required to delineate sensitive features, as well as determine their sensitivity before a preferred area for the development of the WMF can be identified.

#### 5.8.2.5 Environmental (biodiversity), Archaeology and Land use

In the Technical Feasibility Study, the pros and cons for both target areas were identified. The Trekkopje target is further away from human receptors (i.e., more remote to third parties) than is the case for the Vergenoeg target. There might also be less significant archaeological sites on the Trekkopje target than at Vergenoeg. The Trekkopje target is noted to be located within a Biodiversity Yellow flag Area according to the Strategic Environmental Assessment (SEA) undertaken for the central Namib Uranium Rush as well as within the #Gaingu Conservancy, which may favour the Vergenoeg target. Although neither of these categorisations translate to inherent sensitivities. The Trekkopje target is favoured, in part as access to the site enabled a better depth of information than for Vergenoeg.

No specific biodiversity or heritage features were noted as significantly differentiating any portion of the targets from others. That said, the more sensitive biodiversity habitats are aligned to the active/prominent surface drainages and the outcrop areas. Areas where these features occur at a smaller/less prominent scale, and/or a lower density, should be favoured over other areas. Any development footprint should aim to avoid “more significant” drainage lines as far as possible. Flow in impacted drainage lines would need to be diverted, which would need to be addressed in the design and stormwater management planning.

The preferred areas on the Trekkopje target, from a biodiversity perspective, concur with the hydrogeological recommendation as shown in Figure 5-23.

Further specialist studies were recommended to inform the design and limit risks which included the following:

- Terrestrial biodiversity.
- Archaeology.
- Hydrogeology.
- Surface water.

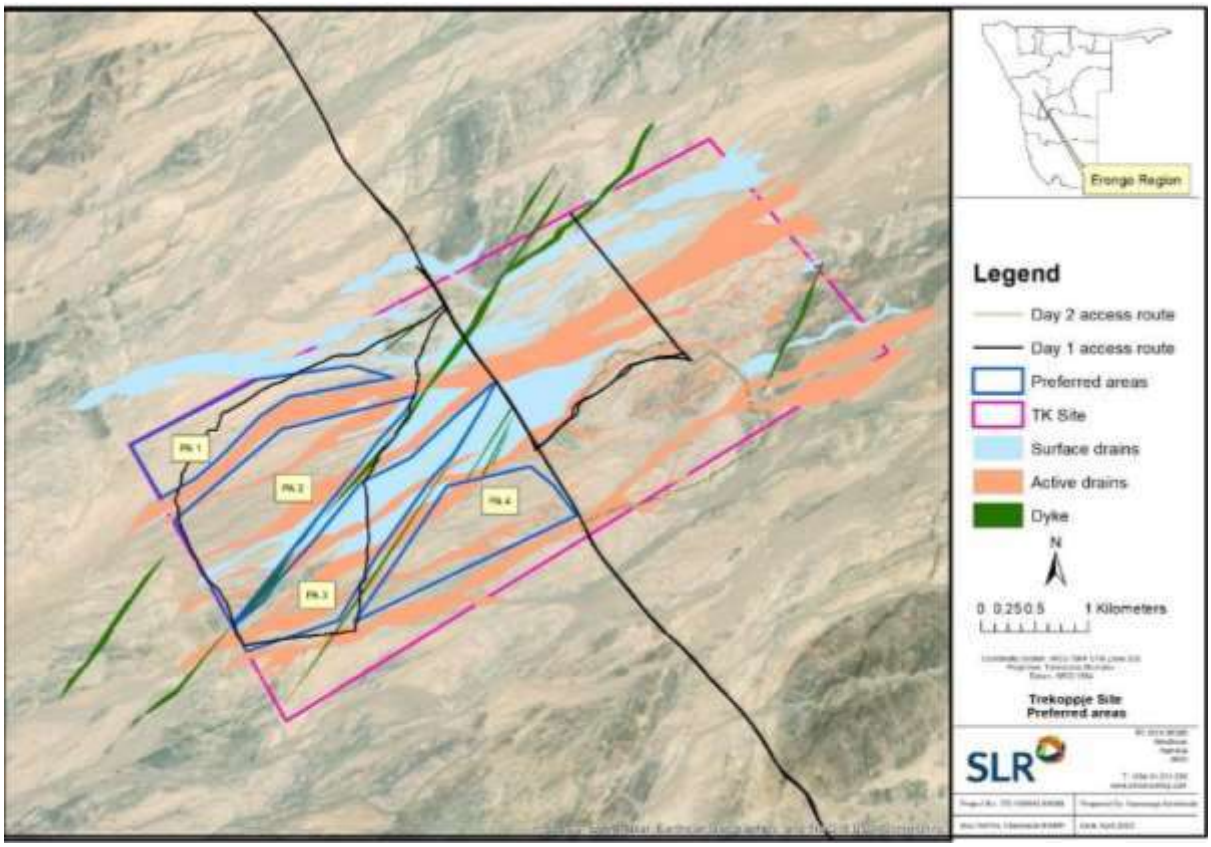


**Figure 5-23: Preferred areas within the Trekkopje target**

### 5.8.3 The option of not implementing the activity 'NO-GO' Alternative

The 'No-Go' alternative is the option of not constructing the NMF and associated infrastructure and where the *status quo* of the current status and/or activities on the project site would prevail. This alternative would result in no additional impact on the receiving environment.

Should the 'No-Go' alternative be considered, there would be no impact on the existing environmental baseline but no benefits to the local and regional economies, as well as no contribution toward greater hazardous waste management in Namibia.

# 6.0 Description of the Baseline Environment

This chapter introduces the baseline conditions of the Project site, as it is currently understood.

## 6.1 Climate

Namibia is one of the most arid countries in sub-Saharan Africa and is characterized by high climatic variability through persistent droughts, unpredictable and variable rainfall patterns, and high variability in temperatures and water scarcity.

The Project site is located in the Namib Desert at a location which receives low annual rainfall (approximately 50 mm) and annual fog deposition of approximately 10 mm. The main rainfall season is between January and March, while most fog occurs during September. High solar radiation, low humidity, and high temperature lead to very high evaporation rates and a substantive annual water deficit. Due to the erratic nature of rainfall in the region, there is a potential for episodic flash floods following rainfall of high intensity.

The dominant winds are SSW and NNE, the latter occasionally reaching storm speeds during winter (warm east winds, or Bergwind). The range of temperatures are wide, with average maximums exceeding 34°C (December) and average minimums being under 5°C (July). Combined, these factors result in a water-stressed environment with adapted vegetation growth. Aridity index (ratio between rainfall and potential evapotranspiration): 0.04 – 0.06 (arid).

Since the 1960s, increased mean, maximum, and minimum temperatures have been observed, and warming in Namibia has been higher than the global average. Future reductions in total precipitation are anticipated.

## 6.2 Topography

The Project site has a relatively gently rolling terrain, sloping (gently) from approximately 580 m above sea level at the north-eastern boundary, down to approximately 490 m at the south-western boundary (see Figure 6-1).

Plains and various shallow washes and low ridges characterise the target area. Quartz gravel covers most of the plains, and sand dominates in washes. A few relatively small outcrops were found across the Project site.

**Figure 6-1: Topographic Profile from the south-western to the north-eastern Boundary (red line)**

The various ephemeral washes (draining lines) traverse the proposed Project footprint in an east to west alignment and drain toward the coast. A number of these drainage lines are relatively well defined (i.e., bigger / more significant than others). The drainage lines on the Project footprint appear to be more significant (i.e., bigger, more drainages and better defined / more prominent across larger areas) on the north-eastern part of the Project site (i.e., north-east of the Trekkopje Road). Despite the low difference in elevation, sporadic flash floods of a high intensity have the potential to cause extensive fluvial erosion.

## 6.3 Geology

The Project footprint is located within the Southern Central Zone of the Damara Orogeny where, on a regional perspective, Swakop Group lithologies are mostly predominant. These lithologies form secondary aquifers, classified to be of low to very low groundwater potential (Lohe, Amster & Swartz, 2020). The Southern Central Zone regionally faulted, folded, intruded by granitoid complexes and dyke swarms, shown in Figure 6-2, also influences groundwater potential and quality.

In terms of regional stratigraphy, Figure 6-3 shows differentiated formations and members of the Swakop Group that predominates in the Central Zone (Miller, 2008).

Table 6-1 details the lithology that are deposited in the area (adopted after SLR, 2012). According to Kadiri *et al* (2023), the area has a low seismic hazard potential.

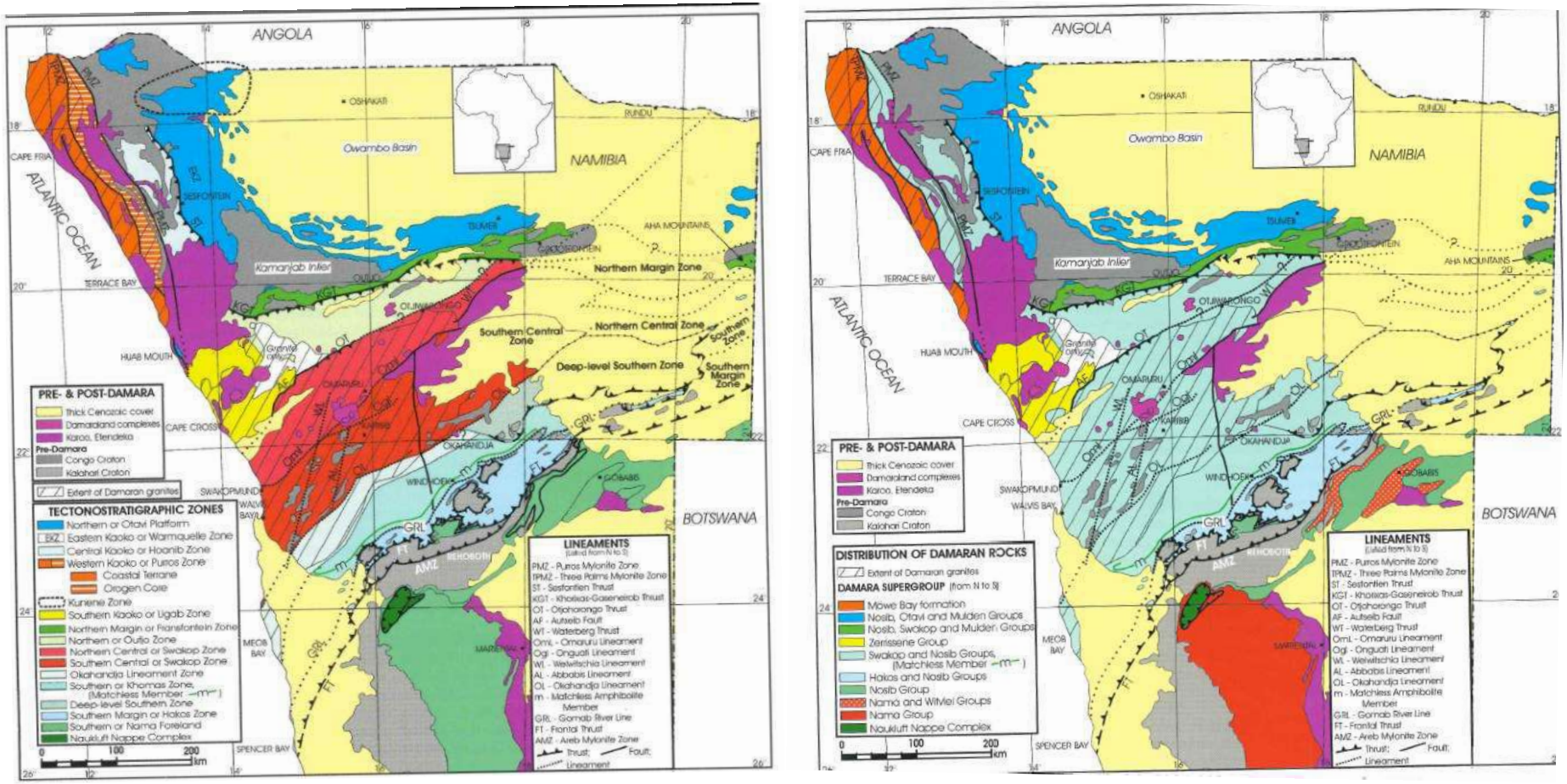


**Figure 6-2: Tectonic stratigraphic zone and distribution of Damaran rocks**

Source: Miller, 2008

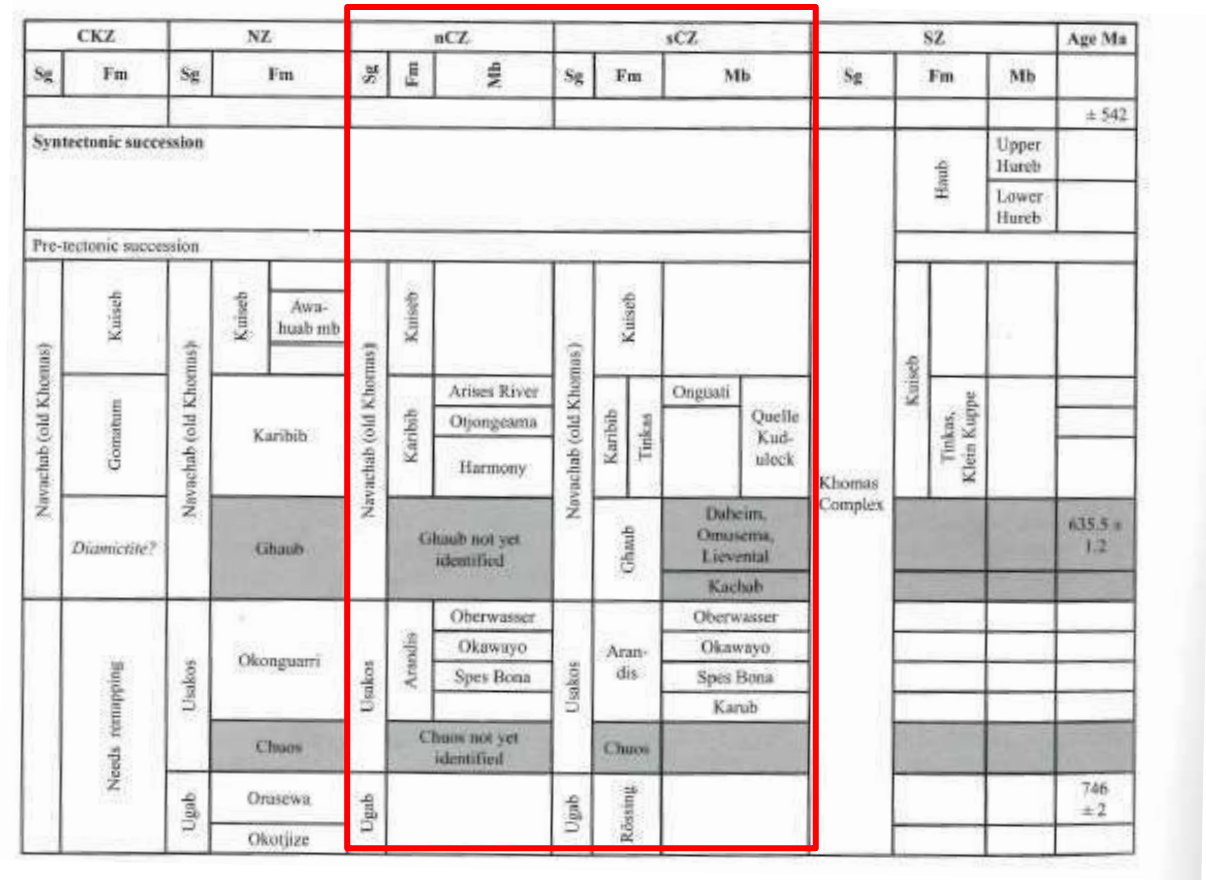


**Figure 6-3: Lithostratigraphy of the Swakop Group in the Southern Central Zone**

Source: Miller, 2008

**Table 6-1: detailed regional stratigraphy**

Source: SLR, 2012

| Group | Subgroup | Formation | Lithology |
|---|---|---|---|
| Swakop | Khomas | Kuiseb | Pelitic and semi-pelitic schist and gneiss, migmatite, calc-silicate rock, quartzite. Tinkas member: Pelitic and semi-pelitic schist, calc-silicate rock, marble, para-amphibolite. |
| | | Tinkas | Mica schist, metagreywacke, calc-silicate rock, quartzite, marble, amphibolite |
| | | Karibib | Marble, calc-silicate rock, pelitic and semipelitic schist and gneiss, biotite amphibolite schist, quartz schist, migmatite. |
| | | Arandis | Mica schist, para-amphibolite, meta-sediments, marble (impure), calc-silicate rocks |
| | | Chuos | Diamictite, clac-silicate rock, pebbly schist, quartzite, ferruginous quartzite, migmatite |
| | Discordance | | |
| | Ugab | Rössing | Marble, pelitic schist and gneiss, biotite-horneblende schist, migmatite, calc-silicate rock, quartzite, meta-conglomerate |

## 6.4 Soils

Soils that form in the Namib Desert are predominantly mineral soils. The soils are composed of raw minerals, sandy, at times calcareous, and are composed of particles in a wide range of sizes. Salt crusts are common on soils close to the ocean and thus repeated accumulation of water causes salt layers to form. Due to high evaporation of water in deserts, water is kept close to the surface and is therefore prone to evaporation.

The soils that occur on the desert plains are sensitive to wind and water erosion and have a significantly shallower rooting depth (on average) than alluvial soils. These soils, associated with the “Desert Plains”, are characterised by moderately deep to shallow silty sands with or without the surface crusting and/or the calcrete horizon.

The extremely dry and hot environment and associated formation of evaporates at shallow depths has resulted in the accumulation of salts and associated clay minerals as inhibiting and restrictive layers on surface (desert plains) and within the soil profile. In addition, the highly variable size fraction of the materials that make up the soil profile (silt and fine sand inter-layered and bedded with pebbles and cobble size material) of the ephemeral channels is significant in the pedogenisis (the process to form soils).

The soils do not retain water other than between the evaporate surface crust and deeper calcrete layers and are prone to erosion if the vegetative cover is removed and the topsoils are disturbed. They are also prone to compaction by heavy vehicle traffic or if overlain by heavy structures.

As the soils do not retain water well and the nutrient levels are generally low, vegetation cover is sparse, and the organic content is low. The scarcity of vegetation cover and further restriction of plant growth because of disturbance reduces the amount of organic matter that is added to the soil, which results into a lower fertility causing, in turn, a lower ability to harbour plants.

A distinctive feature of the gravel plain soils is the presence of a calcrete layer at the base of the soil profile, and the surface crust or capping. In general, the soils are highly sensitive, overlying an evaporate layer of varying thickness and density (calcrete) that occurs above the host rock geology (Enviro Dynamics, 2012).

## 6.5 Land Use

### 6.5.1 General

The area is primarily wilderness with no defined or regular human activity. Land use in the proposed Project site is nominally conservation (under control of the #Gaingu Conservancy) although there is no evidence or information on any current or active conservation usage. Exploration activities in the past have left some disturbance in the form of tracks and small pits, etc.

### 6.5.2 Mining and exploration

Mining activities account for a significant portion of land-use in the Erongo Region, with the main commodities mined being uranium and gold. Salt mining also occurs along the coast at Walvis Bay and Swakopmund. The target area is not currently under a ML.

The Orano Uranium Mine, owned by Orano Mining Namibia (Pty) Ltd (Orano), is located ~ 6.5 km north-west of the target area. In July 2013, Orano placed the project under care and maintenance. Since then, the already constructed facilities have been kept in operating



condition so that the 80% completed mine infrastructure can be started up as soon as there is an upswing in the uranium market. The access road to the Trekkopje Mine (belonging to Orano) bisects the target area of the site. Orano has an access gate between the town of Arandis and the mine site, which is permanently manned by security personnel and access only allowed through arrangement with Orano.

The Rössing Uranium mine (operational mine) is located approximately 20 km south-east of the Project site.

Chaneni Investment (Pty) Ltd has made an application for an EPL, to explore for base and rare metals, dimension stone, industrial minerals, nuclear fuel minerals and precious metals. The EPL application area overlaps with the NMF site. Registration of the EPL is pending the issuing of an ECC.

### 6.5.3 Parks and Communal areas

The Dorob National Park boundary lies ~ 10 km to the west of the Project site and the northern boundary of the Namib Naukluft National Park (NNNP) is ~ 30 km to the south. The Project site lies within the #Gaingu Conservancy (see Figure 6-4).

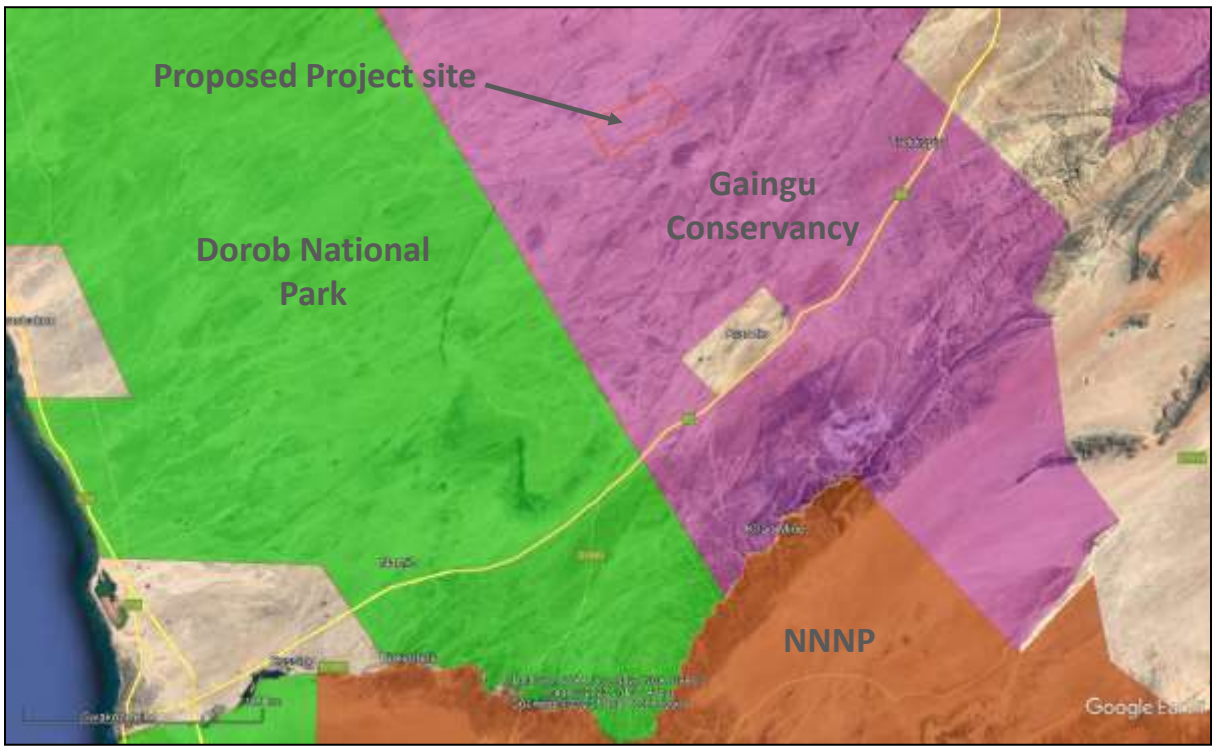


**Figure 6-4: Project site in relation to National Parks (Green shading & Brown shading) and the #Gaingu Conservancy (Pink shading)**

The #Gaingu Conservancy is named after the Khoekhoegowab name for 'Spitzkoppe Mountain'. The conservancy was registered in 2004 and covers an area of ~ 7 800 km$^2$. The Conservancy is home to the following key enterprises: the Spitzkoppe Community Camp (community rest camp, location ~52 km north-east of the proposed project site); trophy hunting and semi-precious stone market along the access road to the Spitzkoppe Community Camp (NACSO, 2023) .

### 6.5.4 Communities / Residential areas and other infrastructure

The Project site has no known human receptors on or in its immediate vicinity. The nearest establishments are at the Trekkopje Mine (~ 7 km to the north-west) and the town of Arandis (~15 km south). There are no other known buildings, public roads or railways closer than this.

The main urban areas in the Erongo Region include the towns of Arandis, Swakopmund, Walvis Bay, Henties Bay, Usakos, and Karibib, as well as a few smaller settlements. The main towns, except Arandis, Karibib and Usakos are located along the coast and are popular holiday and tourist destinations throughout the year.

The town of Arandis, with associated infrastructure (i.e. powerline, informal general landfill site, railway lines, etc.) is located ~15 km south of the Project site. Arandis has a total population of approximately 8 000 residents (Namibia-info, 2023). The Arandis Railway Station is a crossing loop on the Trans-Namib Railway between Swakopmund and Usakos.

The Namibian Institute of Mining and Technology (NIMT) is reputed to be the best vocational training centre in the country and it accepted 1130 students into full time and special positions in its March 2020 intake. It has four campuses, two of which are in Arandis. In 2020, the Arandis campus provided training in: petrol and diesel mechanics, fitting and turning, general electrical, instrumentation, air-conditioning and refrigeration, boiler making and welding, carpentry and joinery, plumbing and sheet metal work, and clothing production (NIMT, 2020).

Between Rössing and Arandis is the B2 National Road, linking the Central Coastal Towns with Windhoek and further east (including Botswana). Refer to Figure 6-5 for the closest receptors.

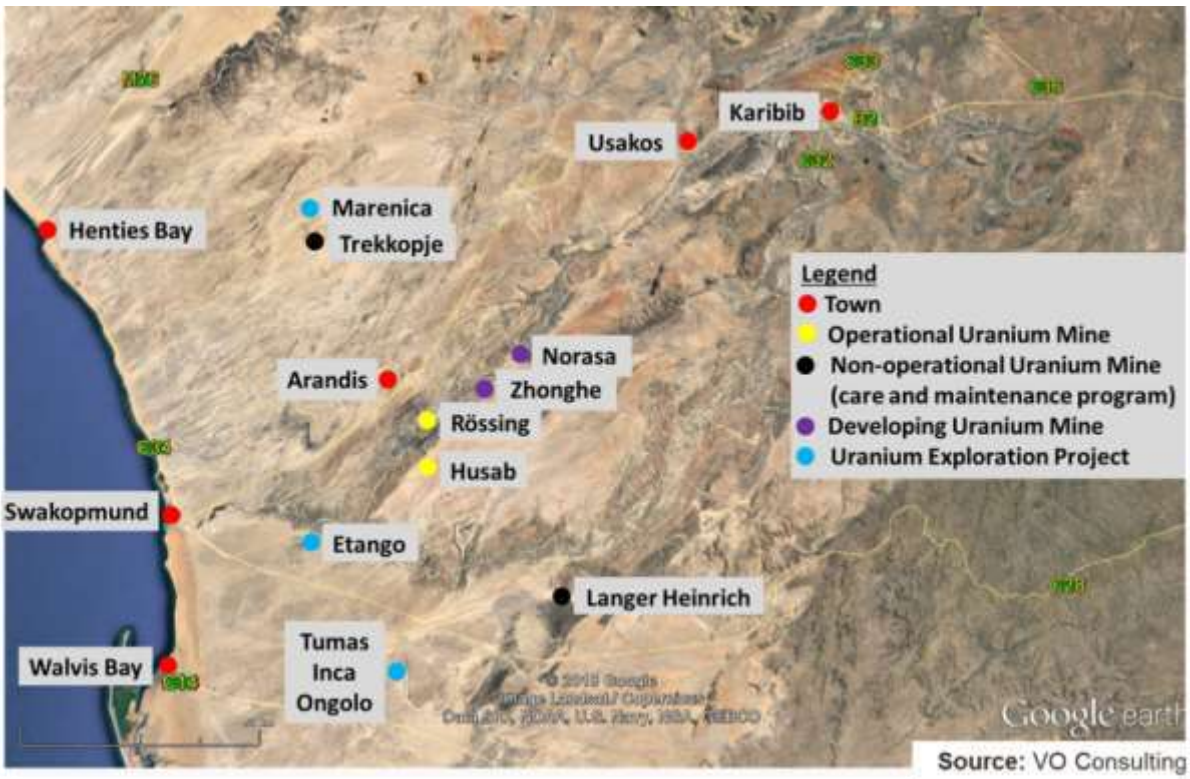


**Figure 6-5: Closest Receptors**

## 6.6 Hydrology & Hydrogeology

The target area falls outside the Swakop-Khan River and Omaruru River Catchments. Washes and drains, mapped via satellite imagery, are west flowing (blue in Figure 6-7) and a source of recharge to aquifers. Active flow in the drains was confirmed during the site visit (Figure 6-6 and Figure 6-7). Flow originates from the eastern side of the site where more out-cropping marble and other geological formations were observed, while in the west the quaternary deposits develop washes that are generally flat. Active flow observed in <20m wide drains, potentially recharges aquifers while supporting vegetation aligned to drainages. South of the area, ephemeral (dry) rivers run into the Khan and Swakop Rivers. The ephemeral Khan River lies ~30 km to the south of the target area in the river canyon.

In the desert environment sensitive ecosystems are closely linked to water availability, which is mostly in the form of groundwater due to extremely low precipitation and high evaporation.

Based on geological information, two types of aquifers, primary and fractured, should be classified in the Project site (Figure 6-7). However, drilling show that only a fractured aquifer (mainly from fractures, karsts and contacts) in marble is prevalent in the site. The primary aquifer formed by quaternary sediments (poorly sorted calcretised sediments, conglomerate) that is also aligned to paleo-channels confirmed in the area north of the site (SLR, 2012) at Trekkopje Mine where the sediments can be over 130 meters thick. SLR (2012) states that the permeable marble aquifers are hydraulically connected to the paleo-channel aquifer in the north of the site and result in local recharge. There may be a similar connectivity between the alluvial sediments and fractured aquifer in the site. The image in Figure 6-6, shows that marble/geological formation outcrops influence surface contributing runoff from exposed surfaces into drainages. Knight Piesold (2022) states that Arandis typically receives about 9.55 mm of precipitation and has 18.83 rainy days (5.16% of the time) annually, therefore recharge volumes are expected to be low considering high evaporation potential in the desert environment.

Outcrops of dolerite dykes were observed during the site visit. Dolerite dykes not known to be water bearing features in this area, may control groundwater flow and compartmentalize the fractured aquifer, were also confirmed. Figure 6-7 shows how the dykes have compartmentalised the site in as much as outcropping lithologies (like marble) control water flow.

Overall groundwater potential is low at the site. However, local potential is moderate when targeting water bearing feature through geophysical methods. Groundwater quality is expected to be brackish with no potable or commercial use locally. SLR (2012) accords that groundwater is defined as saline due to very high total dissolved solids (TDS) between 9 000 mg/l and 47 000 mg/l. Sea water has approximately 34 000 mg/l TDS, while the maximum level for suitability for stock watering is approximately 5 000 to 7 000 mg/l, depending on the stock type. No boreholes or springs were located during the site visit. However, 8 boreholes drilled, test pumped and sampled during the Screening Study confirmed groundwater quality status to be low.

The regional groundwater flow is directed towards the southwest from mainland Spitzkoppe Mountain area and recharges deeper parts of local aquifers of which outcropping formations also contribute runoff with an average hydraulic gradient of 0.015 (1.5%) following topography and surface drainage (SLR, 2012). In this regard, there is no flow towards the strategic river catchments.

**Figure 6-6: Evidence of active flow on the surface drains**

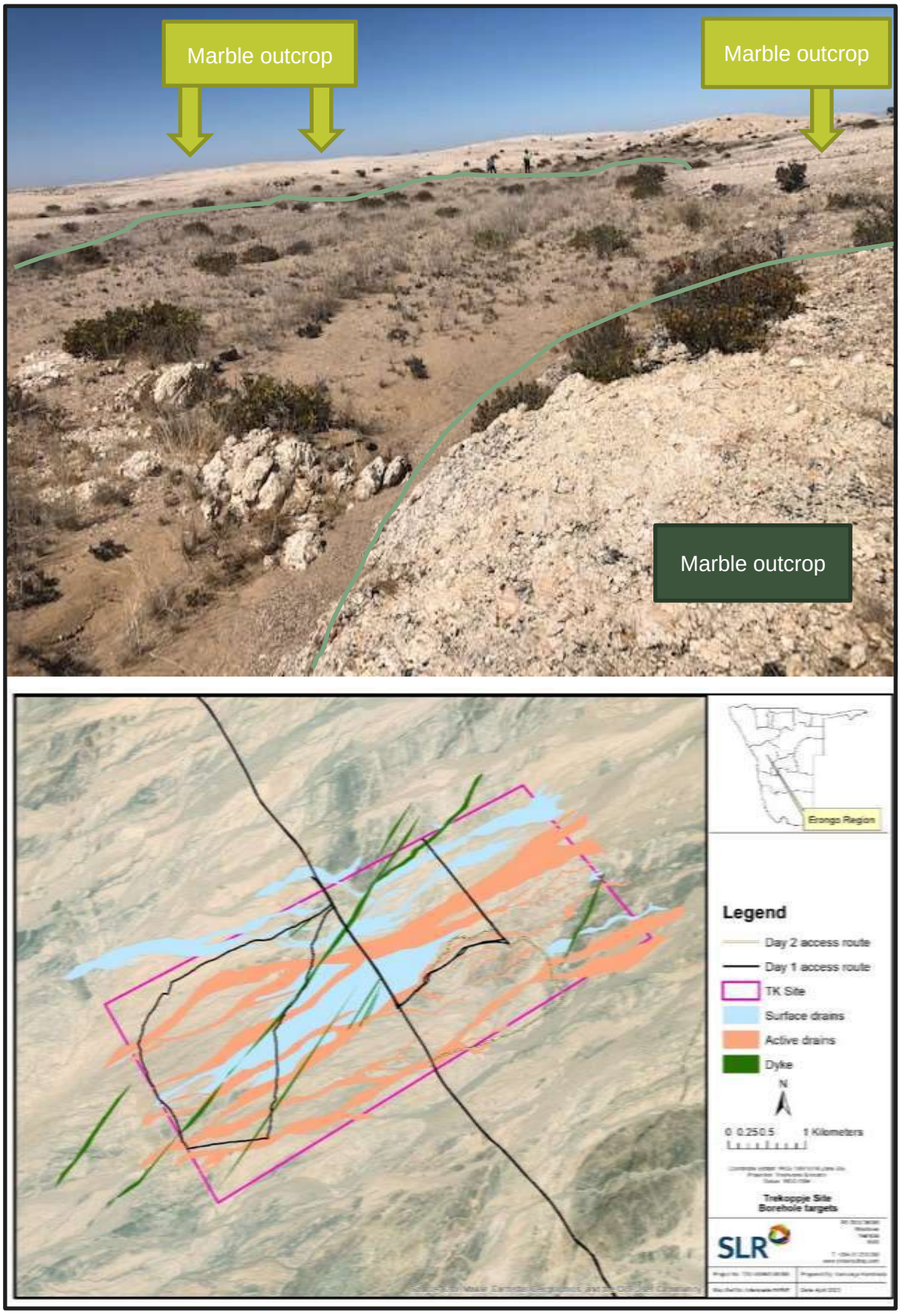


**Figure 6-7: Marble outcrop and surface drain confirmation mapping**

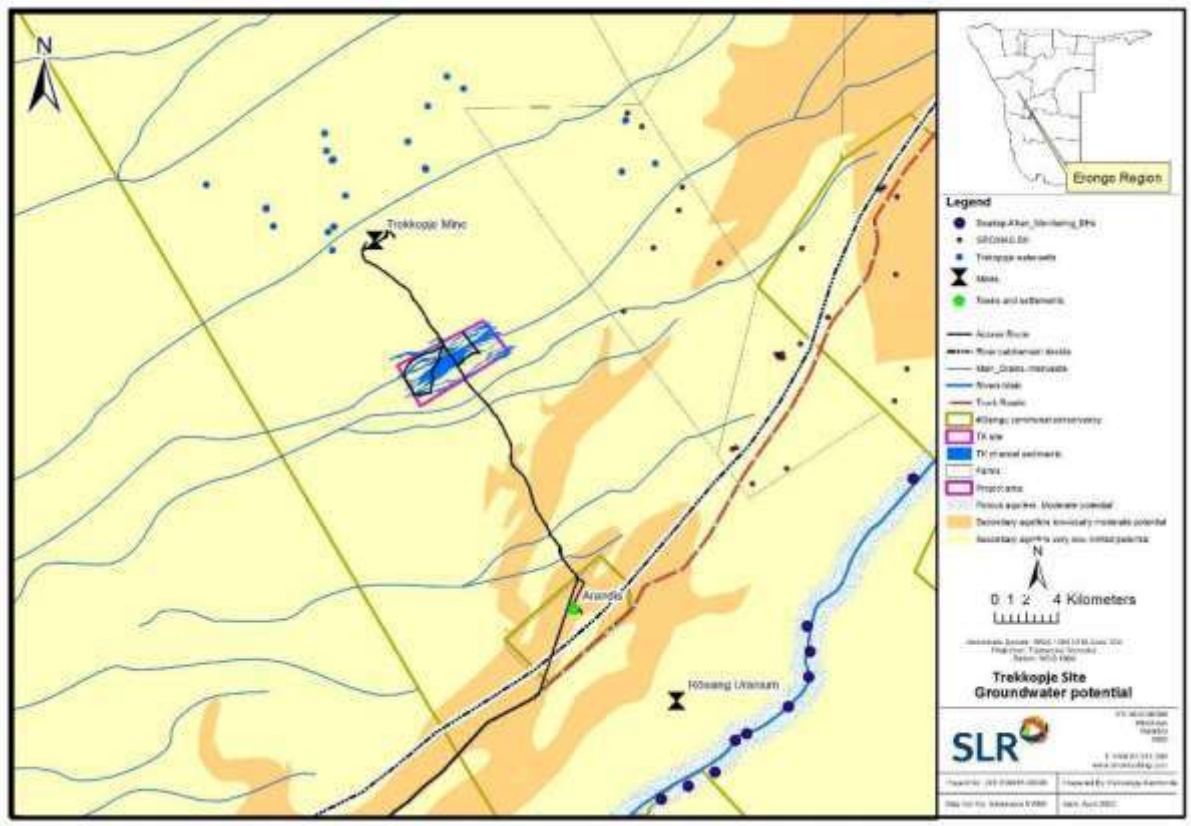


**Figure 6-8: Groundwater potential of the Project site**

The eastern part of the target area is the surface water source area and is thus an additional "recharge zone" for the western part where shallow sediments are mostly prevalent. Field observations in terms of active surface flow and outcrops of dykes, pegmatites and marble are shown in Figure 6-9.

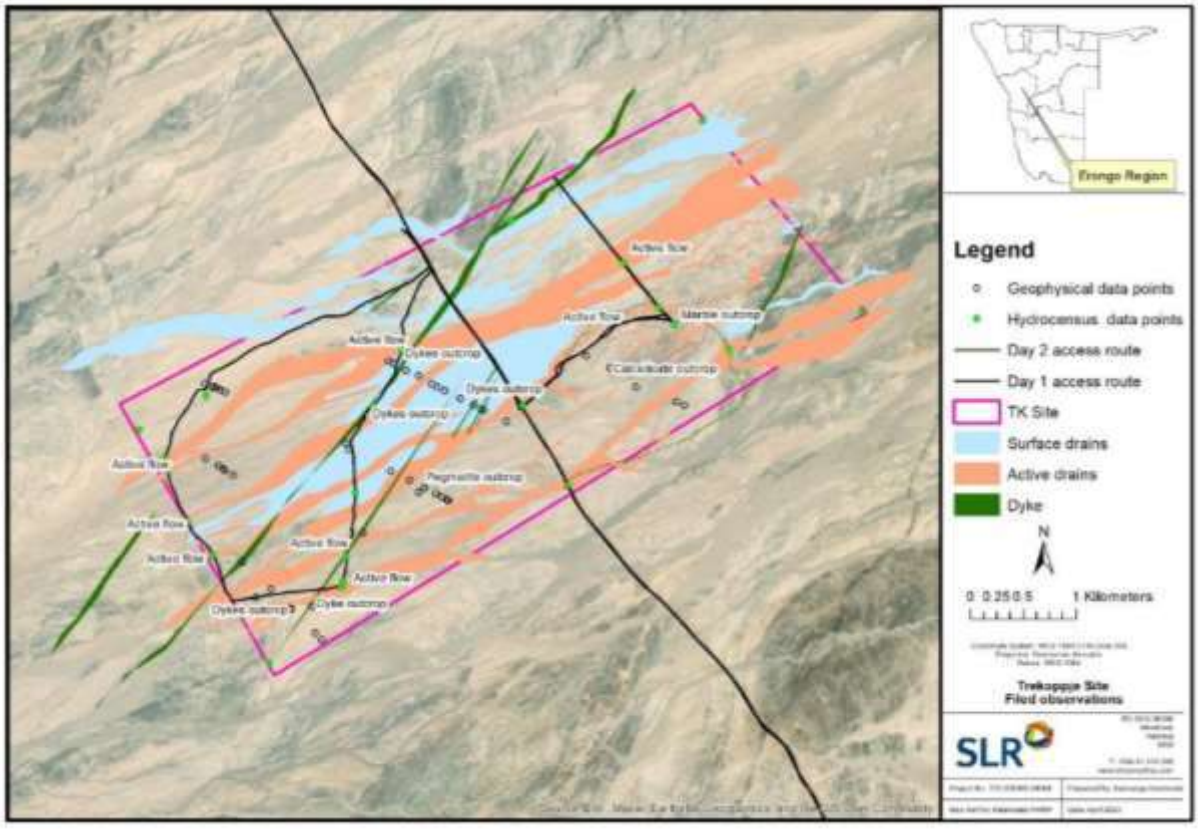


**Figure 6-9: Field observations at marked points during the site walk over and geophysical surveys within the target area.**

The hydrocensus enabled selection of the preferred portion of the target for the WMF, factoring in fatal flaw and sensitivity criterion as set in the Screening Study. As a result, the western side of the target area was favoured, while the eastern side was largely excluded.

## 6.7 Biodiversity

Apart from the large landscape features such as river valleys, the key landscape components for biodiversity in this hyper-arid region (i.e., general region in which the Project site is located) are rocky ridges (which tend to trap moisture from rare rain events and from fog) and drainage lines within the gravel plains, which store water in often extensive sandy aquifers. The available moisture in these components supports higher plant biomass than any other habitats. Rocky ridges range from <1m to >50m in height, but each of these ridge features are important for biodiversity in some way. In relatively level areas, the drainage lines can spread out, forming sheet drainages, often with lower density of vegetation of smaller stature. Although gravel plains are an extensive biotype in the central Namib, they support patchy populations of species with exceptionally small geographic ranges, with the various *Lithops* species being the most celebrated examples, but it may extend to a number of reptile and invertebrate species as well. [1]

The SEA for the central Namib Uranium Rush developed mapping to determine “areas of high biodiversity value in the central Namib in the context of the Uranium Rush”. The Project site

[1] SLR, 2014

lies within the Biodiversity Yellow flag Area #35 (Refer to Figure 6-10). The SEA referred to the following sensitivities in this area: “Relatively undisturbed gravel plains, wildlife concentrations (Springbuck, Ostrich). Very large, dense field of *Sarcocaulon marlothii (*Bushman candle*)”*.

During the site visit no Springbuck or Ostrich were seen, however, spoor of both animals were found on the site. The ‘very large, dense field of *Sarcocaulon marlothii’* are found closer to Arandis (in the outcrop areas – pers. comm. S. Muller (April 2023) and not on the Project site.

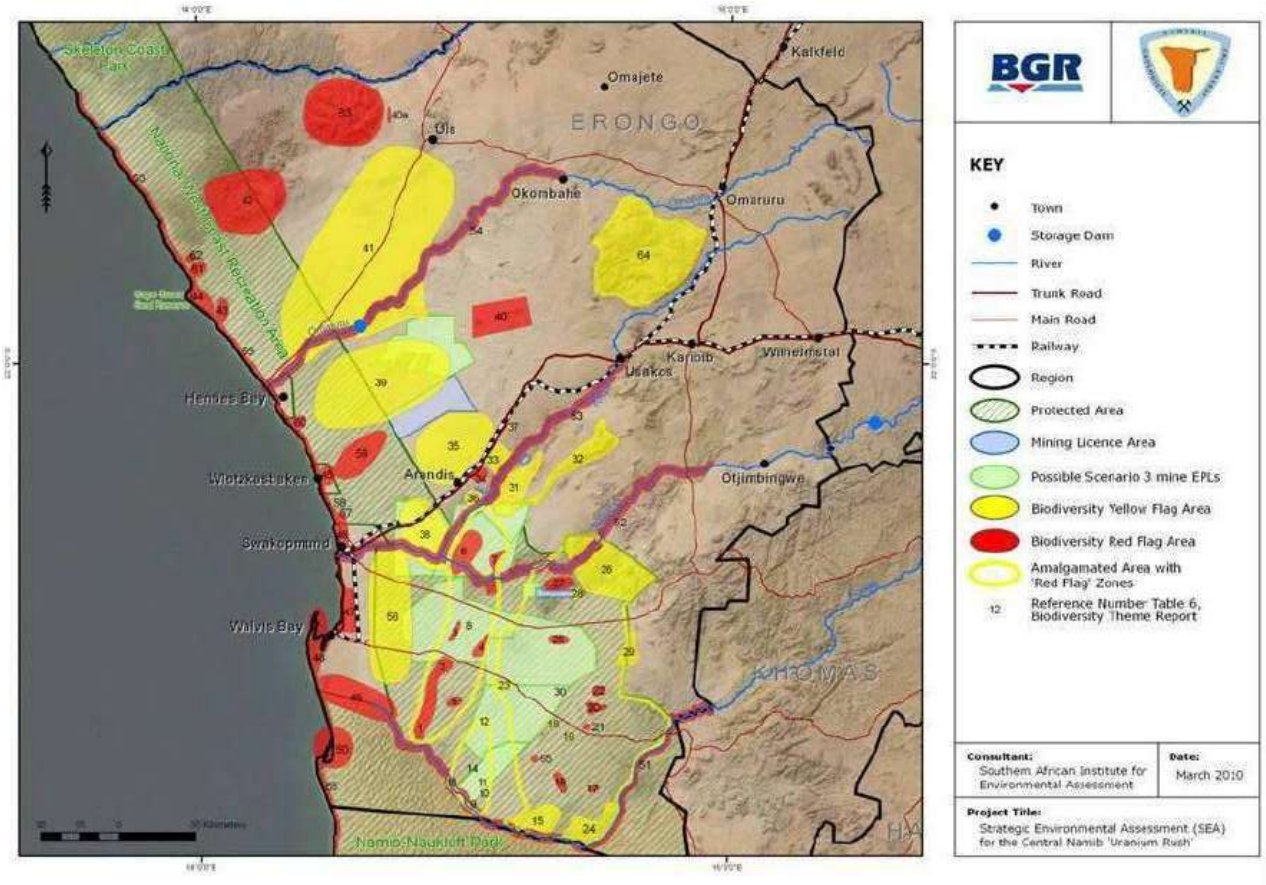


**Figure 6-10: Areas of biodiversity value in the central Namib in the context of the Uranium Rush**

Source: SAIEA, 2010

### 6.7.1 Fauna

The Trekkopje area, is rich in insect, reptile, mammal and bird species diversity. Compared to reptiles and arthropods, mammals are generally not well represented in true deserts for a number of reasons, but importantly, as a result of a lack of water. An estimated 63 species of reptile, 6 amphibian, 52 mammal and 126 bird species occur in the region, of which a high proportion is endemic. The Namib Desert is also known for its high species richness of beetles, particularly those belonging to the family *Tenebrionidae* (Turgis, 2008).

Faunal occurrences within the area are largely determined by the vegetation communities. Animals living in the Namib have adapted to the varying habitats that are presented by the diverse landscape. The majority of permanent plant life in the area is associated with drainage lines and the rocky outcrops. Since these habitats are important sources of both food and

shelter for animals, they will host more fauna than gravel plain areas. Disruption of these substrates will inevitably affect the biodiversity of the area (Enviro Dynamics, 2012).

Within the Project site, drainage lines have emerged as being particularly important and sensitive for birds. These linear oases, with both ephemeral and permanent vegetation, provide food, shelter and breeding habitat for birds and their prey species, especially bustards and korhaans. They also appear to serve as flight paths for groups such as bustards, flamingos and raptors (African Conservation Services cc, 2012).

The following were found during the site visit in March 2023 by the SLR Team:

- A number of snakes (mostly Horned Adder (*Bitis caudalis*)).
- Various lizards
- Two juvenile Namaqua Chameleons (*Chamaeleo namaquensis*)
- Various birds (Namaqua Sandgrouse (*Pterocles namaqua*), including a 'nest' with an egg, amongst others).

Most of the above were observed on the north-eastern side of the Trekkopje Mine access road. Even though no Ostrich were seen during the site visit, Ostrich spoor was observed. The proposed target area and surroundings are sometimes used as breeding grounds by Ostrich (pers. comms. Sandra Muller previously Orano Mining's QHSE Manager).

### 6.7.2 Flora

A unique array of biodiversity exists in the Namib, with high levels of endemism and numerous advanced adaptations to arid conditions. Many of these endemic and near endemic plant species have restricted distribution or habitat, making them extremely vulnerable to disturbance. A contributing factor to the inherent sensitivity of the area is that, due to the low annual rainfall, the recovery period of vegetation in the desert environment is very slow.

Mannheimer (2012) states that while over 30% of plants that occur in the Namib Desert are believed to be endemic; the areas of highest plant endemism in the Namib are the Kaokoveld and the southern Namib. The central Namib, which is not generally regarded as a "hotspot" of endemics however still contain about 16% of the endemic plant species (Enviro Dynamics, 2012).

Overall, the vegetation is dominated by a sparse cover of dwarf shrubs and annual (short-lived) grasses. The vegetation is patchy and usually concentrated in washes / drainage lines.

Plant biomass across the target area is concentrated in shallow drainage areas, but mostly in the "more significant" drainage lines (see Figure 6-7 and Figure 6-11). It was observed that vegetation occurred in lower densities immediately downstream of the outcropping dyke in the north-west of the Project site. This is perhaps indicative that the dyke controls groundwater flow.

The following lists the vegetation that was observed during the site visit, or likely to occur on site (amongst others) (referring to the other EIAs conducted in the relevant area):

- Zygophyllum (Tetraena) stapffii (Dollar bush).
- Commiphora saxicola (Rock Corkwood).
- Zygophyllum (Tetraena) simplex (Succulent herb).
- Salsola and Arthraerua shrubs
- Galenia africana shrub.
- Monechma cleomoides (Namib Perdebos).

- Acacia reficiens (Red Thorn).
- Parkinsonia africana (Green-hair Tree).
- Triraphis pumilio (Small grass).
- Stipagrostis grasses.

The plant species of concern record in the target area are the *Commiphora saxicola* (Rock Corkwood). A relatively large number of *C. saxicola* were found in some of the drainage lines on the north eastern side of the site (i.e. north-east of the Trekkopje Mine access road. Very few were found on the other side of the road.

With reference to the other EIA studies conducted in the relevant area (SLR, 2014 and Turgis, 2008) there is special concern with the occurrence (in scattered patches on the gravel plain and ridge-foot habitats) of *Lithops ruschiorum*, a protected endemic, which is potentially vulnerable due to collection as well as cumulative impacts by other developments. None were observed during the site visit, but this species is very cryptic and only easily seen when it is flowering, so is easy to overlook. It should be assumed that it can occur on site. For all these species the most important risks are related to habitat loss. For many of them, and particularly for the *Lithops* spp., there is the additional risk of removal by collectors.

Other protected and endemic species potentially growing in the general area (but not observed during the site visit) include *Aloe asperifolia* and *Larryleachia marlothii.* Furthermore, a few relatively small areas of lichens were found on site. However, more such areas could be found during a more comprehensive site visit.

### 6.7.3 Habitats and sensitivity

The following broad habitats were identified in the Project site (see Figure 6-11):

- **Gravel Plains**. The majority of the area, specifically to the western side of the Trekkopje Mine access road consists of gravel plains with various small sheet washes. These gravel plains are largely free of plants (except for some patches found in the small washes). The plains are sensitive to vehicle tracks.
- **Drainage lines (i.e. bigger / "active / prominent" drainage lines)**. With reference to the sections above, these are typified by the trees and shrubs (relatively dense in certain sections) as well as a far more diverse fauna and flora community than on the plains, making it sensitive to disturbance.
- **Smaller drainage lines**. These are typified by the scattered occurrence of trees and shrubs and also more diverse fauna and flora community than on the plains, however less than the bigger drainage lines. These smaller drainage lines are therefore more sensitive to disturbance than the gravel plains but less than the bigger drainage lines.
- **Rocky / Gravelly outcrop areas**. A few outcrops of pegmatite, schist, dolerite and marble found on site, mostly on the north-eastern side of the Trekkopje Mine access road, however a few small outcrops were noted on the western side, as well as the intrusive dolerite dyke / outcrop, which transects the site. This dolerite outcrop is not very prominent and only elevated a few meters (in certain areas on site). Some of these outcrop areas potentially harbour species of concern and would be more sensitive from a biodiversity point of view. Limited plant and animal life was however found on the (relatively) low dolerite outcrop areas visited. These outcrop areas were not mapped in detail but may be evident in the topographic survey.

(Note: distinct habitat zones cannot be demarcated without a detailed mapping exercise. Figure 6-11 provides a "high level" indication of the habitats).

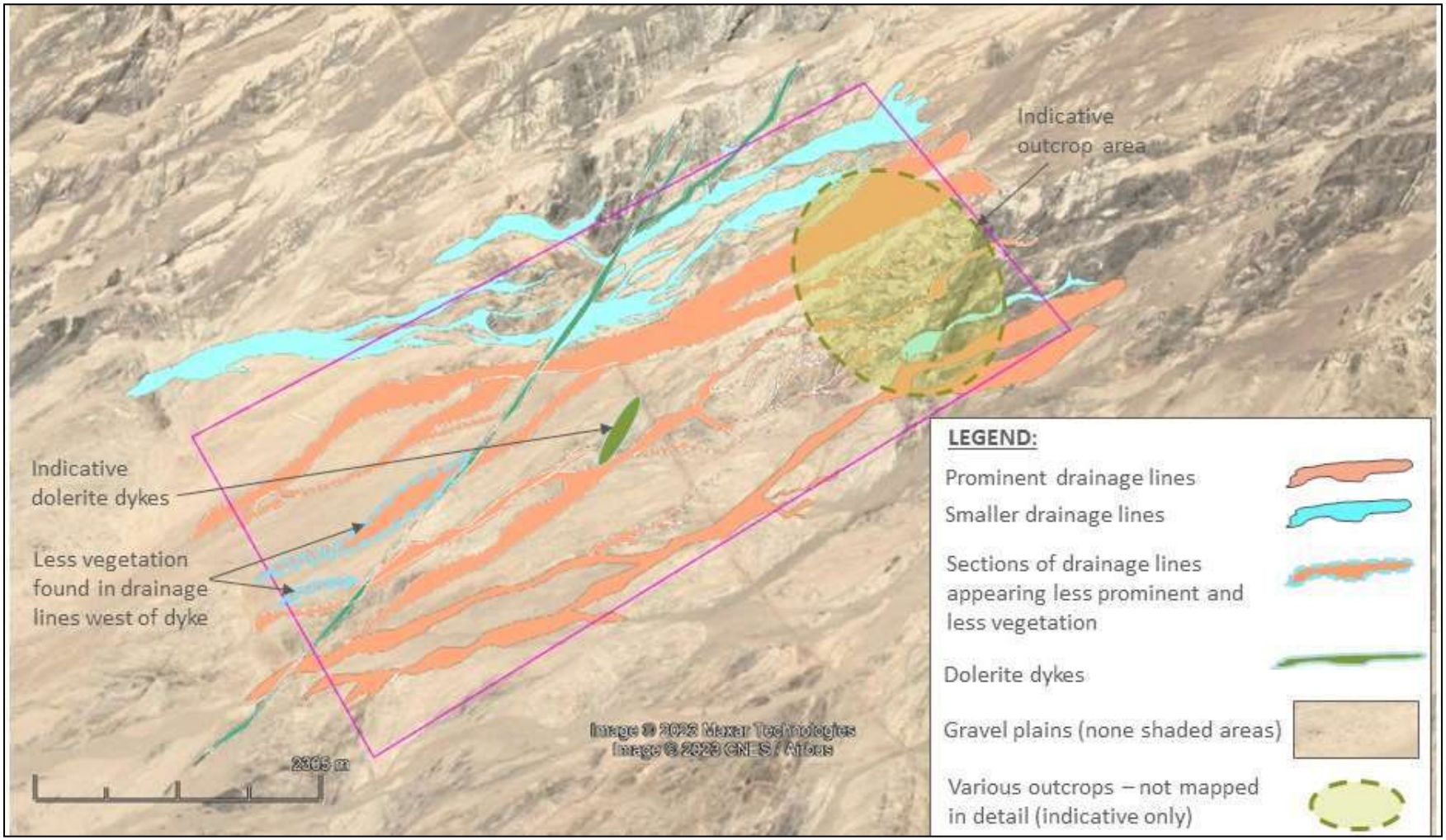


**Figure 6-11: Key habitats – Project site (excluding all outcrops)**

## 6.8 Archaeology

The edge of the Namib Desert occasionally supports dense annual grass cover following good summer rains. This, combined with temporary impoundments of water in natural rock hollows, provided an important resource base for pre-colonial hunter-gatherer communities. Harvester termites accumulate wild grass seeds in underground caches. These underground “reserves” have been exploited by people in the Namib for approximately 500 years. During such seed diggings, women would use winnowing trays to clean grit and husks from the seed which would then be stored in large-capacity clay pots. These seed supplies would then create a degree of food security which seems to have contributed to modest human population growth in the immediate pre-colonial era. In dry conditions, the seeds could be stored for over a year.

In the region, the seed diggings and other archaeological sites are likely to be clustered around low granite outcrops. Although the seed diggings are highly abundant, they are not archaeological occupation sites and are not considered particularly significant. However, diggings are evidence of human activity and their presence is a reliable indicator of a possible occupation site within a radius of about 4km (Kinahan, 2012 in Enviro Dynamics, 2012). Seed-digging sites might occur on the Project site.

According to Kinahan (in Turgis, 2008), an archaeological assessment of the Trekkopje uranium tenement found that the area is poor in Holocene remains, but that the historical Annaberg tin workings merit protection under the National Heritage Act. The old Annaberg mine workings cover an area of approximately 3 ha and are located at the eastern boundary of the Trekkopje ML area. The archaeological sites located on the proposed temporary pipeline routes to the Trekkopje Mine (which was located to the east of the Trekkopje waste site consisted of mid-Holocene to recent hunter-gatherer artefact scatters. The sites are ephemeral in that they consist of surface scatters of mainly stone artefact flaking debris. The distribution of archaeological sites appears fairly patchy. The area located to the east / outside the proposed waste site area contains a light scatter of stone artefact debris and a number of stone hunting blinds. They provide a valuable indication of the local distribution of hunting blind sites, as well as confirmation of their association with the prominent dolerite dykes.

Some of the above-mentioned sites might also be found on the Project site. However, the dolerite dyke cutting through the Project site is much less prominent than others in the region. It could potentially have a lower likelihood of archaeological sites.

## 6.9 Air Quality

Air quality in Namibia is generally good and air pollution is broadly not considered a key issue in Namibia. There are few industrial sources mainly associated with mining and smelting activities, which are generally remote from populated areas (FAO, 2001). Vehicle density and use in the urban areas is not currently sufficient to lead to major problems. Particulate Matter (PM) concentrations in Windhoek have been found to be relatively high due to vehicle exhaust emissions and re-suspension of road dust caused by moving vehicles (Hamtui & Beynon, 2017). Socio-economic activities such as minerals exploration and industrial development in Namibia have the potential to promote fugitive dust production (Von Holdt & Eckardt, 2017), whilst dust particles smaller than 10 µm can pose adverse effects to human respiratory and cardiovascular (Chen et al., 2010; Griffin & Kellogg, 2004; Kanatani et al., 2010). Namibia does not currently have air quality policies, regulations or standards in place (Ehsani, 2017).

## 6.10 Radiology

Reference is made to Figure 6-5, which depicts the location of radiologically sensitive receptors in Namibia’s Erongo Region.

Based on the assumptions described in the Screening Study, the average annual public radiation exposure dose at the Project site is due to the following individual exposure dose contributions:

- Due to the inhalation of radon and its decay products: approx. 0.2 mSv/a, as inferred from radon measurements at Swakopmund, Walvis Bay, and a monitoring location in-between Arandis and the Rössing Mine;
- Due to the inhalation of radioactive ambient atmospheric dust containing long-lived radioactive constituents: approx. 0.003 mSv/a for adults and 0.002 mSv/a for infants, as inferred from a recent regional air quality assessment; and
- Due to exposure to gamma radiation from terrestrial and cosmic sources: approx. 0.95 mSv/a, as inferred from the terrestrial and cosmic contributions determined during the on-site gamma dose rate assessment.

It is noted that the potential consumption of borehole water and food produced on site is not considered.

## 6.11 Socio-economic

### 6.11.1 Regional Overview

#### 6.11.1.1 Arandis

Arandis is the nearest town to the Project site. Arandis is located about 60 km east of Swakopmund and was established in 1970 to house employees of Rössing Uranium Limited (RUL); it was proclaimed a municipality in 1994. It has good transport links and infrastructure, and the town is well-laid out (Ashby Associates, 2023). Key areas such as the business centre and municipal offices are easily accessible to the whole population which was 5 100 people in 2011 (NSA, 2014). No data is available on household sizes and composition.

Although the town has always been economically dependent on RUL, it has made great effort to attract other industries. Since the construction and opening of the Husab mine, Arandis has experienced considerable population growth and has built housing in Extension 5 and 7, mainly for workers at the Husab mine. The number of ratepayers has grown to 3 700 (domestic and business), a 61% increase since 2017. The town has no informal settlement, but many houses have backyard shacks[2].

#### 6.11.1.2 The #Gaingu Conservancy

The NMF will be constructed within the #Gaingu Conservancy area. The #Gaingu Conservancy covers an area of 7 721km$^2$, bordering with the Dorob National Park to the east, the Omaruru River to the north, the Erongo Mountains and Usakos to the west, and south. It additionally covers the land surrounding Trekkopje, Arandis and the old Khan Mine with the B2 trunk road cutting through its south-eastern border. It was registered as a conservancy in 2004 and has an entirely rural population of approximately 3 000 people who make a living from farming with goats and livestock, relying considerably on cash remittances from family members who have jobs elsewhere and from social welfare grants for children and pensioners (Ashby Associates, 2023).

[2] Pers Com. Geraldine Tjiramba, Accountant, ATC on 15/3/2023 (Ashby Associates, 2023)

The #Gaingu Conservancy is a legally recognised community conservation organization, gazetted in 2004, that enables the people living in the communal area to have rights to actively manage natural resources in that area and to generate returns from them. Conservancies are typically defined by social ties uniting groups of people with the common goal of conservation.

The 2021 Namibian Association of Community Based Natural Resource Management (CBNRM) Support Organisations (NACSO) institutional report on the conservancy noted that it maintains excellent communication with stakeholders and conservancy members hold its management committee accountable. Its main enterprise is the Spitzkoppe Community Campsite which employed 21 staff of whom 17 were women in 2021. Some conservancy members are small scale miners for semi-precious stones which can be found in some of the mountains in the region (NACSO, 2023).

#### 6.11.1.3 Vulnerable Populations Living in the Project Area

Namibia signed the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2007. The Constitution of Namibia emphasises equality and freedom from discrimination on the grounds of sex, race, colour, ethnic origin, religion, creed or social or economic status (Article 10).

“While most people in Namibia can be characterized in a strict sense as indigenous to the area, the San, Himba, Ovatua, Ovatjimba, and Ovazemba are recognized by the Government as particularly marginalized groups. The conditions of these groups, especially relative to other segments of the population of Namibia, can be identified as similar to those of groups identified as indigenous worldwide” (Anaya, 2013).

The 2011 census identified 37 San-speaking households living in urban areas in the whole of the Erongo Region but did not differentiate within Otjiherero-speaking peoples, which includes the Himba. Should any indigenous peoples be living in the coastal towns, it is expected that their households are known to local level political structures, such as councillors, as they are entitled to food aid distributed by government (Ashby Associates, 2023).

### 6.11.2 Broader Socio-economic Factors

#### 6.11.2.1 National Economic Overview

Namibia’s rich mineral base and small population of 2.5 million gives it a World Bank classification of an upper-middle-income country, yet Namibia’s level of income inequality is among the highest in the world, with a Gini coefficient of 0.59[3] (NSA, 2019). In 2022, the Gross Domestic Product (GDP) per capita at market prices was N$79 431 (NSA, 2023).

The country experiences widespread rural and urban poverty, low educational attainment, few technical skills, and major housing back-logs in all urban areas and deepening unemployment (Ashby Associates, 2023). Thirty-three years after Independence from South African rule, the governing political party, SWAPO, is under more pressure than ever before to improve the lives of Namibians. The economy shows signs of a slow economic recovery from the recession of 2016-2020 and the 2020/21 COVID-19 pandemic, mainly due to positive improvements in the mining and financial services sectors.

Tertiary industries (including the public sector, retail and wholesale, transport and services sectors) have always been the most significant contributor to Namibia’s GDP in recent years,

[3] The Gini coefficient can take any values between 0 to 1 (or 0% to 100%). A coefficient of zero indicates a perfectly equal distribution of income or wealth within a population. Data show that the coefficient generally ranges from 0.24 to 0.63.

contributing 55.5%, in 2022. Secondary industries contributed 15.8% to GDP and include manufacturing such as meat and other food processing, beverages, mineral processing, electricity generation and construction. The primary industries contributed 20.8% to GDP (NSA, 2023).

The Institute for Public Policy Research (IPPR), a Namibian NGO think-tank, summed up the economic situation in July 2020 and all the points remain valid in 2023:

> *"Levels of private investment and Foreign Direct Investment, upon which future growth depends, had sunk back to levels not seen since before the Global Financial Crisis. Levels of public investment had also started to decline as the splurge in public spending since 2009 aimed at countering the global downturn petered out while levels of public borrowing reached their limits. Long-standing characteristics, such as poor or non-existent formal employment growth, limited export diversification, the bloated size of the public sector, the generally poor performance of Public Enterprises, and wasteful public spending were all visible. Corruption and mismanagement were widespread as demonstrated most starkly by the Fishrot scandal which had arisen from the secretive way in which one of Namibia's key economic sectors had been managed over many years" (IPPR, 2020).*

An analysis of the state of the Namibian economy (Sherbourne, 2022) points the way forward to include:

- A clampdown on corruption and adoption of a more technocratic approach to economic management;
- Oil and Green Hydrogen projects should start to take shape in coming years allowing government to borrow and bridge fiscal gap;
- Oil and gas revenues are effectively managed, and benefits are distributed across population leading to poverty reduction and resources for climate adaptation;
- Government uses oil and Green Hydrogen as a means of diversifying the economy.

#### 6.11.2.2 Employment and Unemployment

In the Erongo Region, the labour force stood at 112 800 in 2018, with a labour force participation rate of 81% (86% among males and 75% among females) which is the highest of all the regions, compared to the national average of 71% (NSA, 2019b). However, 41% of those employed were in informal employment – such as working in private households or in agriculture and fishing – and had no social protections such as a pension scheme, medical aid, or social security (NSA, 2019b).

Conversely, the Erongo Region recorded the second lowest regional unemployment rate at 30%, with women only slightly more likely to be unemployed than men: 31% of women were unemployed, compared to 29% of men in the region (NSA, 2019b). Youth unemployment however, amongst people aged 15-34 years, was 37% in the region, and fairly equally affecting young men and women (NSA, 2019b).

#### 6.11.2.3 Poverty and Vulnerability

Poverty is defined as "the number of people who are unable to command sufficient resources to satisfy basic needs" (NSA, 2017). They are counted as "the total number of people living below a specified minimum level of income or below a national poverty line" (NSA, 2017). The projected upper middle-income poverty rate of 62.4% means the number of poor people in Namibia, living on the upper middle-income poverty line of USD 5.5 (N$84)/person/day, has reached 1.56 million (World Bank, Oct 2022). The national rate of multi-dimensional poverty (based 11 indicators on living standards, health and education) averages at 43.3% of the

population, with almost 60% living in rural areas compared to 25% of urban dwellers – such as in the CCA. Female headed households, larger households and households with many children are more likely to suffer multidimensional poverty. Based on the 2011 census figures, the Erongo Region has the lowest incidence of multidimensional poverty in Namibia at 16.6% (NSA, 2021) although this is likely to be higher in 2023.

Due to the history of Namibia, poverty has evolved along racial and ethnic lines; white Namibians hold more wealth and power and are seldom found in the low-income and vulnerable groups. The most vulnerable groups at the coast are women and men living in poverty, with low incomes. Many but by no means all, are recent migrants who have come to seek work and a better life from rural areas in Northern Namibia, whose home languages are Oshiwambo or Rukwangali. Language is a door opener, but as they often have poor English and no Afrikaans, they struggle to find work or training opportunities (Ashby Associates, 2023).

# 7.0 Potential Project Risks and Impacts

This chapter describes potential issues and presents an early evaluation of potential impacts associated with the proposed project.

## 7.1 Impact identification

A scoping-level identification of environmental impacts (physical, biological, social and economic) potentially associated with the proposed Project is described in this chapter. The sequence in which these issues are listed are in no order of priority or importance. The chapter identifies all potential impacts, as raised by the project team and I&APs and provides consideration on the relevance of the impacts to the proposed project. Potential impacts of relevance to the proposed Project will be assessed in detail during the EIA phase using the methodology presented in Section 8.4.

## 7.2 Public Concerns

The issues and concerns raised by I&APs to date are included in a Comments and Responses Report (see Appendix C). Where appropriate, the Scoping Report has been edited and updated to address the I&AP comments.

## 7.3 Preliminary evaluation of environmental and social impacts

As the project design, baseline studies and aspect modelling have not been completed, a comprehensive impact assessment cannot be conducted at this stage. However, the impacts that are potentially anticipated given the Project proposal, its locality and status of the existing environment have been identified and an indication made on whether it will be positive or negative.

The potential impacts considered to be of relevance and the requirements for further investigation during the EIA phase, either by the EAP or by the identified specialist, are identified in the following table. It is possible that additional impacts will be added based on I&AP inputs or the results of the site assessments of the EAP and of the relevant specialists.

**Table 7-1: Preliminary assessment of impacts**

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| **Land uses and capability** | | | |
| Direct | Currently the footprint is nominally set aside for conservation (#Gaingu Conservancy).<br>Development of the site as a general and hazardous waste facility will forego this opportunity. | Negative | ▪ Assessment of agricultural and land use potential to determine potential loss – Soils and Agricultural Assessment. |
| Direct | Conflict with other proposed/planned uses of the site or local area. | Negative | ▪ Assessment by EAP with consideration of Soils and Agricultural Assessment, and Socio-economic Study. |
| **Topography and soils** | | | |
| Direct and Cumulative | Site clearance and levelling during the construction phase will cause some additional exposed areas | Negative | ▪ Assessment by EAP with consideration of Project Design, Soils and Agricultural Assessment, and Hydrology Study. |

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| | and could trigger erosion and siltation | | |
| Direct and Cumulative | Loss of topsoil during construction through site clearance or poor handling and stockpiling. | Negative | ▪ Assessment of soils to determine potential loss – Soils and Agricultural Assessment. |
| Direct and Cumulative | Contamination of soils as a result of contaminant spillage during construction or operations | Negative | ▪ Assessment of soils to determine potential loss – Soils and Agricultural Assessment. |
| Direct | Change in topography due to the construction of waste cells of 25 meters high. | Negative | ▪ Assessment by the EAP. |
| ▪ **Biodiversity (Flora)** | | | |
| Direct | The clearance for the construction of the proposed structures and infrastructure will result in vegetation loss.<br>Loss of floral species of conservation concern (SCC) (if present).<br>Diversion of surface water flows could affect flora in downstream environments. | Negative | ▪ Assessment of flora to determine potential loss – Biodiversity Assessment.<br>▪ Assessment of alteration of surface water flows – Hydrological Assessment. |
| Indirect | Accidental introduction of alien species and invaders with imported materials | Negative | ▪ Assessment of flora to determine potential risks – Biodiversity Assessment. |
| ▪ **Biodiversity (Fauna)** | | | |
| Direct and Cumulative | Habitat destruction or displacement/loss of faunal SCC (if present) during construction.<br>Habitat fragmentation and disturbances to faunal species during operations. | Negative | ▪ Assessment of fauna to determine potential risks – Biodiversity Assessment. |
| Direct and Cumulative | Fauna mortalities from interactions with waste infrastructure/waste transport vehicles. | Negative | ▪ Assessment of fauna to determine potential risks – Biodiversity Assessment. |
| ▪ **Social** | | | |
| Direct and Cumulative | Job creation and skills development | Positive | ▪ Assessment of potential benefits – Socio-economic Assessment. |
| Direct and Cumulative | Economic stimulation | Positive | Assessment of potential benefits – Socio-economic Assessment. |
| Indirect and Cumulative | Degradation of the regional sense-of-place (tourism) | Negative | ▪ Assessment of potential risks – Socio-economic Assessment. |
| Indirect and cumulative | Health risks to employees and public from general and hazardous waste handling. | Negative | ▪ Assessment of potential risks to health – Air Quality Impact Assessment and Radiation Assessment. |



| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| | | | |
| ▪ **Climate change** | | | |
| Direct and Cumulative | Greenhouse gas emission contributions (climate protection) | Negative | ▪ Air Quality Impact Assessment to quantify potential greenhouse gas emissions.<br>▪ |
| ▪ **Waste Management** | | | |
| Direct | Implementation of the waste management hierarchy to obtain the most sustainable result from waste streams through recovery, where possible | Positive | ▪ Assessment by the EAP with consideration of Project Design |
| Direct | Legal disposal of waste to managed facility | Positive | ▪ Assessment by the EAP with consideration of Project Design |
| ▪ **Traffic** | | | |
| Direct | Increased volume of heavy vehicles on the access roads and high-risk nature of the loads of hazardous waste on the vehicles resulting in road safety concerns. | Negative | ▪ Traffic Impact Assessment to assess the potential change in vehicle volumes and the likely impacts on road safety. |
| Direct | Increased volume of heavy vehicles on the access roads causing degradation to road infrastructure and level of service. | Negative | ▪ Traffic Impact Assessment to consider the suitability of the access roads and intersections for the potential traffic load. |
| ▪ **Heritage** | | | |
| Direct | Destruction of heritage resources on the site | Negative | ▪ Assessment of heritage resources to determine potential risks – Heritage Assessment. |
| ▪ **Hydrogeology** | | | |
| Direct | Reduction in groundwater quality from exposure to leachate | Negative | ▪ Specialist Hydrogeological Impact Assessment to determine the contaminant sources, model the dispersion plume and assess impacts on groundwater quality. |
| Direct | Dispersion of contaminants and reduction in groundwater quality influencing other users | Negative | ▪ Sensitive receptors to be identified.<br>▪ Specialist Hydrogeological Impact Assessment to model the dispersion plume and assess impacts on identified receptors. |
| ▪ **Hydrology** | | | |
| Direct | Increase in runoff and erosion from the site resulting in increased sediment loads | Negative | ▪ Hydrological Assessment to consider potential risks during construction and operation. |
| Direct | Reduction in surface water quality in the watercourse/resource from exposure to general and | Negative | ▪ Hydrological Assessment to identify risks and determine management of storm water during construction and operation. |

| Type of impact | Activity | Status of impact prior to mitigation | Indicative approach to assessment |
|---|---|---|---|
| | hazardous wastes or other contaminants | | |
| Direct | Alteration of flow paths, beds and banks of watercourse | Negative | ▪ Consideration of facility design by the EAP and hydrological specialist.<br>▪ Hydrological Assessment to determine management of storm water during construction and operations. |
| Direct | Flood risk to the NMF from upstream surface flows.<br>Reduction in runoff volumes to the catchment from containment of runoff | Negative | ▪ Hydrological Assessment to determine typical and extreme flows.<br>▪ Consideration of designs of storm water facilities by EAP and hydrological specialist to ensure maximum diversion of clean storm water to the environment. |
| ▪ **Air Quality** | | | |
| Indirect | Increase in local dust fall levels resulting in nuisance at receptors | Negative | ▪ Sensitive receptors to be identified.<br>▪ Air Quality Impact Assessment to compile emissions inventory to identify sources; undertake modelling to predict emissions and estimate dispersion plumes for dustfall, particulates and criteria air pollutants. |
| Direct | Increase in odours at receptors | Negative | ▪ Sensitive receptors to be identified.<br>▪ Air Quality Impact Assessment to assess potential for odour generating activities and to consider dispersion of such gases to receptors. |
| Direct | Increase in gaseous emissions | Negative | ▪ Air Quality Impact Assessment to compile emissions inventory to identify sources; undertake modelling to predict emissions and estimate dispersion plumes for dustfall, particulates and criteria air pollutants.<br>▪ Consideration of plant design and emissions controls by Air Quality specialist to ensure emissions comply with standards or better. |
| Direct | Increase in ambient levels of criteria air pollutants at receptors | Negative | ▪ Air Quality Impact Assessment to assess emissions of criteria air pollutants against legislated limits.<br>▪ Consideration of plant design and emissions controls by Air Quality specialist to ensure emissions comply with standards or better. |
| Indirect | Health risks to nearby receptors from inhalable particulates and or pollutants | Negative | ▪ Sensitive receptors to be identified.<br>▪ Air Quality Impact Assessment to compare modelling and dispersion results against legislated and best practice limits to assess health risks to key receptors. |

# 8.0 Terms of Reference for the Impact Assessment Phase

This chapter presents the Terms of Reference for the Impact Assessment phase of the EIA process as required in terms of Section 9 of the EIA Regulations. It describes the nature and extent of the investigations to be conducted and sets out the proposed approach to the Impact Assessment phase.

## 8.1 Impact Assessment Phase Objectives

The key objectives of the Impact Assessment phase are to:

- Conduct detailed environmental and social baseline studies of the project site for the proposed project and the surrounding environment;
- Assess the potential environmental (direct, indirect, and cumulative) impacts of the proposed project;
- Identify mitigation and management measures to be implemented to mitigate against potential negative environmental impacts, and to enhance potential positive environmental impacts during the project life cycle of the proposed project;
- Undertake a comprehensive PPP to provide I&APs, Key Stakeholders, Organs of State with an opportunity to review and provide comments on the outcomes of the EIA process and the acceptability of the proposed mitigation and management measures;
- Develop an EMP for the proposed project; and
- Provide measures for on-going monitoring (including the undertaking of environmental audits) to ensure that the proposed project and recommended mitigation and management measures are implemented as outlined in EIA and EMP.

## 8.2 Description of the Tasks Planned for the EIA Phase

An overview of the EIA process, highlighting each task and corresponding activities, is provided in Chapter 3.0. The Impact Assessment phase will be implemented to ensure that it complies with the requirements of the EMA and EIA Regulations. The various tasks / activities (including the indicative duration thereof) that will be undertaken during the Impact Assessment phase are summarised in Table 8-1.

**Table 8-1: Key Tasks (and Indicative Timing) of the Impact Assessment Phase**

| Task No. | EAP activity | Indicative duration | Opportunities for I&AP participation |
|---|---|---|---|
| 1 | • Review / update I&AP database<br>• Ongoing consultation with I&APs. | Continuous throughout the Impact Assessment phase | Comments to be sent to SLR |
| 2 | • Manage specialist activities and receive inputs for the EIA Report and EMP.<br>• Internal review of specialist studies. | 4 months | |
| 3 | • Assess potential environmental impacts and | 2 months | |

| Task No. | EAP activity | Indicative duration | Opportunities for I&AP participation |
|---|---|---|---|
| | identify management measures.<br>• Compile draft EIA Report and EMP. | | |
| 4 | • Release Draft EIA Report including specialist reports and EMP to I&APs for 30-day review and comment period.<br>• Arrange and facilitate public meetings and focus group meetings (if necessary). | 1 month | EIA Report review and comment.<br>Participation during public meetings and focus group meetings |
| 5 | • Assimilate I&AP comments.<br>• Finalise the EIA Report, Comments and Response Report and EMP. | 2 weeks | |
| 6 | • Submit Final EIA Report and EMP (incorporating I&APs' comments) | | |
| 7 | • Follow up on the final decision by MEFT. | | |

## 8.3 Specialist Studies

### 8.3.1 General Terms of Reference for the Specialist Studies

The following general Terms of Reference will apply to the Specialist Studies:

- Describe the baseline conditions that exist on site and identify any sensitive areas that would need particular consideration;
- Ensure alignment with available biodiversity data for the area;
- Review the Comments and Responses Reports in the Final Scoping Report to ensure that all relevant issues or concerns relevant to the field of expertise are addressed;
- Identify and assess potential impacts of the construction, operation, and decommissioning phases, as well as the No-Go Alternative;
- Identify and list all legislation and permit requirements that are relevant to the proposed project;
- Identify areas where issues could combine or interact with issues likely to be covered by other specialists, resulting in aggravated or enhanced impacts;
- Indicate the reliability of information utilised in the assessment of impacts as well as any constraints to which the assessment is subject (e.g., any areas of insufficient information or uncertainty);
- Consider the precautionary principle in the assessment of all potential impacts;

- Identify feasible ways in which impacts could be mitigated and benefits enhanced giving an indication of the likely effectiveness of such mitigation and how these could be implemented in the construction and management of the proposed project;
- Ensure that specialists use a common standard, the determination of the significance of the assessed impacts will be undertaken in accordance with a common Convention;
- Include specialist expertise and a signed statement of independence; and
- Comply with the relevant specialist assessment and minimum report content requirements listed in the EMA, EIA Regulations, and/or best practice guideline/standard.

### 8.3.2 Specific terms of reference for each specialist study

The specific, additional Terms of Reference for each of the proposed specialist studies is provided in Table 8-2 below.

**Table 8-2: Specific Terms of Reference for the proposed Specialist Studies**

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| **Terrestrial Biodiversity**<br>**(Henriette Potgieter)** | The proposed terms of reference for the study are as follows:<br>• Provide a broad description of the existing environment in terms of its terrestrial biodiversity (including Avifauna, Animal and Plant species), based on a field survey and available literature;<br>• Identify, map (locations of species of conservation concern and conservation value / sensitivity map) and describe the features/resources present on site that could be affected by the proposed project, based on a field survey and available literature;<br>• Identification of terrestrial biodiversity features of importance/sensitivity that could be affected by proposed activities;<br>• Determination of potential impacts of proposed activities on terrestrial biodiversity features;<br>• Investigate ecological / biodiversity processes that could be affected (positively and/or negatively) by the proposed project;<br>• Assess the significance of the loss of faunal species, and impact on ecological / biodiversity processes as a result of the implementation of the proposed project; and<br>• Identify practicable mitigation measures to reduce any potential negative faunal impacts and indicate how these could be implemented in the construction and management of the proposed project. |
| **Socio-economic**<br>**(SusDaF)** | The proposed terms of reference for the study are as follows:<br>• Provide a broad social description of the area in the vicinity of the proposed project;<br>• Provide a detailed description of the socio-political history and demographics of the area; |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| | • Identify and assess potential social impacts as a result of the proposed project. This may include, but is not limited to, the following aspects:<br>• Creation of employment and local expenditure;<br>• Impact on local communities and surrounding landowners due to external construction workers and influx of job-seekers;<br>• Sense of health and well-being of affected communities and surrounding landowners;<br>• Impact on existing land use and economic activities;<br>• Generation of clean, renewable energy; and<br>• Social sustainability of the proposed project, identifying feasible alternatives to ensure social equity and justice.<br>• Determine whether the distribution of potential negative impacts unfairly discriminate against any person, particularly vulnerable or disadvantaged persons; and<br>• Identify practicable mitigation measures that would reduce potential negative impacts and enhancement measures to increase potential social benefits. |
| **Visual**<br>**(Graham Young Landscape Architects)** | • Identify sensitive receptors, determine key visual characteristics, features and viewpoints;<br>• Map, significant visual characteristics features, viewpoints and visual receptors associated with the site;<br>• Establish visual intrusion, visibility and visual exposure of the project components in the receiving environment.<br>• Identification of visual receptors, viewsheds of importance and sense of place that could be affected by proposed activities;<br>• If necessary to inform the assessment, undertake simulation of visual change/viewshed analysis caused by the project to receptors;<br>• Assess the significance of potential visual impacts resulting from the proposed project from various important viewpoints, e.g., transport corridors, neighbouring farmsteads / residential areas, recreational areas and other surrounding land-uses (i.e., viewer-observer distances, bulk, compatibility with surrounding area, viewer catchments, etc.); and<br>• Identify practicable mitigation measures to reduce potential negative visual impacts and to identify how these can be built into the project design. |
| **Heritage/Archaeological/Paleontological** | Provide a description of the archaeology, palaeontology and cultural heritage of the site and identify and map any |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| **(Beyond Heritage)** | sites of archaeology, palaeontology or cultural significance that may be impacted by the proposed project:<br>• Assess the sensitivity and conservation significance of any sites of archaeological, palaeontology or cultural heritage significance affected by the proposed project;<br>• Identify and assess the significance of the potential impacts of the proposed project on archaeological, palaeontology and cultural heritage;<br>• Make recommendations on the protection and maintenance of any significant cultural heritage and/or archaeological / palaeontology sites that may occur on site;<br>• Identify practicable mitigation measures to reduce potential negative impacts on the archaeological / palaeontology resources and indicate how these can be incorporated into the construction and management of the proposed project;<br>• Provide guidance for the requirement of any permits from the National Heritage Council of Namibia that might become necessary. |
| **Traffic Assessment**<br>**(Burmeister and Partners)** | • Determination of the transport requirements of the project and its phases<br>• Investigate, assess and map the road infrastructure and traffic baseline<br>• Provide a description of the surrounding road network;<br>  ○ Conduct manual traffic counts at key traffic intersections within the vicinity of the project site;<br>  ○ Categorise heavy vehicles and light motor vehicles<br>  ○ Trip making characteristics of local residents;<br>  ○ Road network status and capacity<br>  ○ Road pavement conditions<br>  ○ Geometric details of intersections<br>  ○ Identification of existing management and control problems<br>• Determine trip generation characteristics of the project<br>• Map all traffic infrastructure associated with the site and potentially affected areas<br>• Identification of traffic features and environment that could be affected by proposed activities<br>• Identify practicable mitigation measures that would reduce potential negative impacts and enhancement measures to increase level of service for any affected intersections. |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| **Air Quality Assessment**<br>**(SLR)** | • Identify, map and describe the physical and air quality parameters of relevance within the project area;<br>• Generate a project emissions inventory and predict dispersion to define potential impacts resulting from the planned project activities;<br>• Consider cumulative impacts on the areas air quality; and<br>• Produce appropriate management and mitigation plans required to ensure that potential impacts are adequately addressed. |
| **Radiation Assessment** | • This study has been removed from the EIA scope as the applicant has elected not to include the disposal of radioactive waste in the current NMF application. This may be revisited in future. |
| **Soils and Agricultural Assessment**<br>**(The Biodiversity Company)** | • Consult with engineering team/EAP to source required project parameters.<br>• Identify possible sources of existing information and negotiate access, if necessary.<br>• Review of existing reports, soils and agricultural databases, aerial photos, topographical maps and satellite imagery.<br>• Review data on soils, vegetation, erosion, agricultural resources, potential and productivity, employment etc.<br>• Review relevant legislation to determine requirements for data collation and reporting.<br>• Review MAWLR departmental requirements.<br>• Collate information from external sources on soils and agricultural resources.<br>• Conduct field work to identify, describe, characterise, assess and map the soils, and agricultural resources as per the relevant protocol.<br>• Map on a detailed plan all soils and agricultural resources associated with the site and potentially affected areas.<br>• Provide a comprehensive baseline description of the receiving soils and agricultural resources of the site as per the relevant protocol.<br>• Document the findings in a Soils and Agricultural Specialist Assessment Report.<br>• Recommend the appropriate mitigation for each soil and agricultural resource to reduce potential impact significance.<br>• Present the mitigation as potential impact management actions and potential impact management outcomes for inclusion in the EMP.<br>• If necessary, develop a ‘monitoring program’ for overall project operations. |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| **Hydrogeology**<br>**(SLR)** | • Identify aquifers and receptors across the site and surrounds.<br>• Determine and delineate key geological structures and geohydrological features that could act as preferential flow paths for the movement of groundwater.<br>• Conduct percolation tests to determine the permeability of the shallow soils.<br>• Map, on a detailed plan, all geohydrological features, resources and receptors associated with the site and potentially affected areas.<br>• Provide a comprehensive description of the receiving geohydrological environment.<br>• Develop a numerical groundwater flow model:<br>  ○ Prepare conceptual model of the dynamics of the groundwater system including aquifer distribution and groundwater flow directions.<br>  ○ Develop a groundwater transport model.<br>  ○ A solute transport model must be used to determine particle tracking from potential pollution sources (waste cells, dams) for both business scenarios.<br>• Consideration of sources, pathways and receptors.<br>• Potential groundwater pollution sources must be identified.<br>• Determination of potential inflows into the waste cells.<br>• Inputs into site water balance.<br>• Assess the risk to groundwater and recommend mitigation measures that should be in place to minimize impacts from risks identified.<br>• Identification and simulation of various mitigation options.<br>• Identification of the need for dewatering or diversions based on numerical model.<br>• Design of the optimum groundwater management strategy, with inputs to design engineers (if required).<br>• Define a groundwater monitoring protocol/programme suitable to detect change in the receiving environment and relate to this project or other influences. |
| **Hydrology**<br>**(SLR)** | • Identify, characterise and map the surface water environment on, adjacent to, and immediately downstream of the project area;<br>• Describe the physical and hydrological parameters of relevance, with particular respect to water quality and flow parameters; |

| Specialist Study (appointed consultants) | Terms of Reference |
|---|---|
| | • Delineate and assess flood lines (50 and 100 year) for the watercourses on the site in terms of accepted protocols;<br>• Develop a concept for diverting flow in impacted watercourse(s) around the facility;<br>• Define potential impacts resulting from the planned project activities and<br>• Consider cumulative impacts on the area's hydrology; and to produce appropriate management and mitigation plans required to ensure that potential impacts are adequately addressed. |

## 8.4 Method of Assessing Impact Significance

### 8.4.1 Introduction

The identification and assessment of environmental impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of, *inter alia*: the purpose and need for the project; views and concerns of I&APs; social and political norms, and general public interest.

### 8.4.2 Identification and description of impacts

Identified impacts will be described in terms of the nature of the impact, compliance with legislation and accepted standards (where relevant), receptor sensitivity and the significance of the predicted environmental change (before and after mitigation). Mitigation measures may be existing (design) control measures or additional measures that were identified through the impact assessment and associated specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of mitigation.

### 8.4.3 Criteria for impact assessment

The criteria for impact assessment significance are provided in Table 8-3 below. Defining the significance of an impact includes a combination of understanding the sensitivity of the environment combined with the magnitude of the impact. The magnitude is determined by understanding the intensity, extent and duration of the impact. The full Impact Assessment Methodology is included in Appendix D.

**Table 8-3: Criteria for Assessing Significance**

**Significance = Sensitivity x Magnitude**

**Where Magnitude = Intensity + Extent + Duration.**

| | SENSITIVITY | | | | |
|---|---|---|---|---|---|
| | VERY LOW | LOW | MEDIUM | HIGH | VERY HIGH |

| MAGNITUDE | | | | | | |
|---|---|---|---|---|---|---|
| | VERY LOW | NEGLIGIBLE | NEGLIGIBLE | VERY LOW | LOW | LOW |
| | LOW | VERY LOW | VERY LOW | LOW | LOW | MEDIUM |
| | MEDIUM | LOW | LOW | MEDIUM | MEDIUM | HIGH |
| | HIGH | MEDIUM | MEDIUM | HIGH | HIGH | VERY HIGH |
| | VERY HIGH | HIGH | HIGH | HIGH | VERY HIGH | VERY HIGH |

## 8.5 Integration of Specialist Findings – EIA Report and EMP

The specialist findings, recommendations and other relevant information will be integrated into an EIA Report and EMP. The full specialist studies will be included as appendices to the EIA Report.

The EMP will provide design requirements and relevant management and mitigation measures to ensure potential impacts are avoided or minimised to acceptable levels during the construction and operations phases of the project. The aim of the EMP would furthermore be to ensure that the project activities are managed to enhance potential positive environmental impacts. The EMP would detail the impact management objectives, outcomes and actions as required, the responsibility for implementation and the schedule and timeframe. Requirements for monitoring of environmental aspects, as well as compliance monitoring and reporting, will also be detailed. If approved, the provisions of the EMP would be legally binding on the project applicant and all its contractors and suppliers.

## 8.6 Consultation in the EIA Phase

### 8.6.1 Competent Authority

Any conditions attached to the acceptance of the Scoping Report will be implemented in the EIA process. If requested, a meeting shall be held with MEFT (as the competent authority).

### 8.6.2 Stakeholders

A description of the stakeholder engagement tasks that will be undertaken during the Impact Assessment phase, with specific reference to the opportunities for consultation and participation for I&APs is detailed below. This information must be formalised into a Stakeholder Engagement Plan for use in the Impact Assessment phase of the EIA, into the construction and operational phases of the project.

#### 8.6.2.1 Update I&AP database

The EAP appointed for the Impact Assessment phase of the EIA process will review the project I&AP database to ensure landowners affected by the “preferred project option(s)” will, amongst others, be identified and added to the I&AP database. Included in this update will be the identification of vulnerable groups to be consulted as part of ongoing stakeholder engagement.

#### 8.6.2.2 Notification of I&APs

All I&APs on the project database will be notified of relevant events in the EIA process via electronic mail, or if required, post. This will include when the EIA Report is available for public review and invitations to possible public feedback meetings/open days.

#### 8.6.2.3 Information to be provided to I&APs

The draft EIA Report (including specialist studies, EMP and other appendices) will be released for a 30-day review and comment period. The following tasks will be undertaken in order to notify I&APs of the release of the EIA Report:

- A notification letter (with an Executive Summary) and text message will be sent to all registered I&APs via email, to inform them of the release of the draft EIA Report and where the full report can be reviewed.
- Copies of the full EIA Report (including specialist studies, EMP and other appendices) will be made available on the EAP's website and at publicly accessible locations in Arandis (Arandis Community Library).

#### 8.6.2.4 Details of the engagement process

The stakeholder engagement process in the Impact Assessment phase will include the following:

- Ongoing identification and notification of stakeholders;
- Registration of parties as I&APs on the project database;
- Collation of issues and concerns into a Comments and Response Report for inclusion in the EIA Report;
- Circulation of the draft EIA Report for public review (30-days);
- Executive Summaries will be made available (in English); and
- Notification of I&APs on the database of the availability of the report for review and information relating to focus group meetings and public meetings.

During the review period of the draft EIA Report, focus group meetings will likely be held with the following stakeholders / I&APs (if necessary):

- MEFT
- MME
- MAWLR
- National Heritage Council
- NRPA

In addition to the above requirements, the following will also need to be implemented:

- Ensure that (if necessary) public meetings are held at a time and place, and in an understandable format, that are conducive for genuine participation by affected people. Liaise with the relevant local authorities to assist and provide input as far as possible.
- Use social media as platforms to discuss issues raised by I&APs.
- Apply the principle of free, prior and informed consent as the project is located on land within a conservancy, even though the land is owned by government, as government has given usage rights to conservancy members.
- Strengthen transparency, accountability and control mechanisms for disadvantaged user groups, such as through grievance mechanisms, to identify and reduce risk to human rights.

#### 8.6.2.5 Grievance mechanism

A detailed Grievance Mechanism will be compiled for use through the remainder of the EIA process and into the construction and operation phases of the project.



The Grievance Mechanism should include amongst others the following:

- Purpose of the Grievance Mechanism;
- Definition of Grievance;
- Roles and Responsibilities;
- Grievance Management;
- Complaint Register;
- Confidentiality/ Data Management;
- Conflicts of Interest;
- Protection from retaliation.

## 8.7 Review and Decision by MEFT

On receipt of the final EIA Report, MEFT (DEA) will review the report to make a decision on the application for ECC.

## 8.8 Way forward for Scoping

### 8.8.1 Review by MEFT

The Final Scoping Report will be submitted to the MEFT. MEFT (DEA) will review the report and make a decision on the Scoping phase of the EIA.

If the Scoping Report were to be accepted, the project may proceed onto the Impact Assessment phase (see Section 3.1.5).

The applicant has appointed SLR as the EAP to facilitate the Impact Assessment phase in terms of the requirements of the EIA Regulations, the Terms of Reference in the accepted Scoping Report and any conditions set out by the Environmental Commissioner.

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# Record of Report Distribution

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| Name | Entity | Copy No. | Date Issued | Issuer |
|---|---|---|---|---|
| Librarian | Arandis Community Library | 1 | 15 November 2023 | S. Strauss |
| MEFT | MEFT | 1 | 18 January 2024 | S. Strauss |
| | | | Click to enter a date. | |
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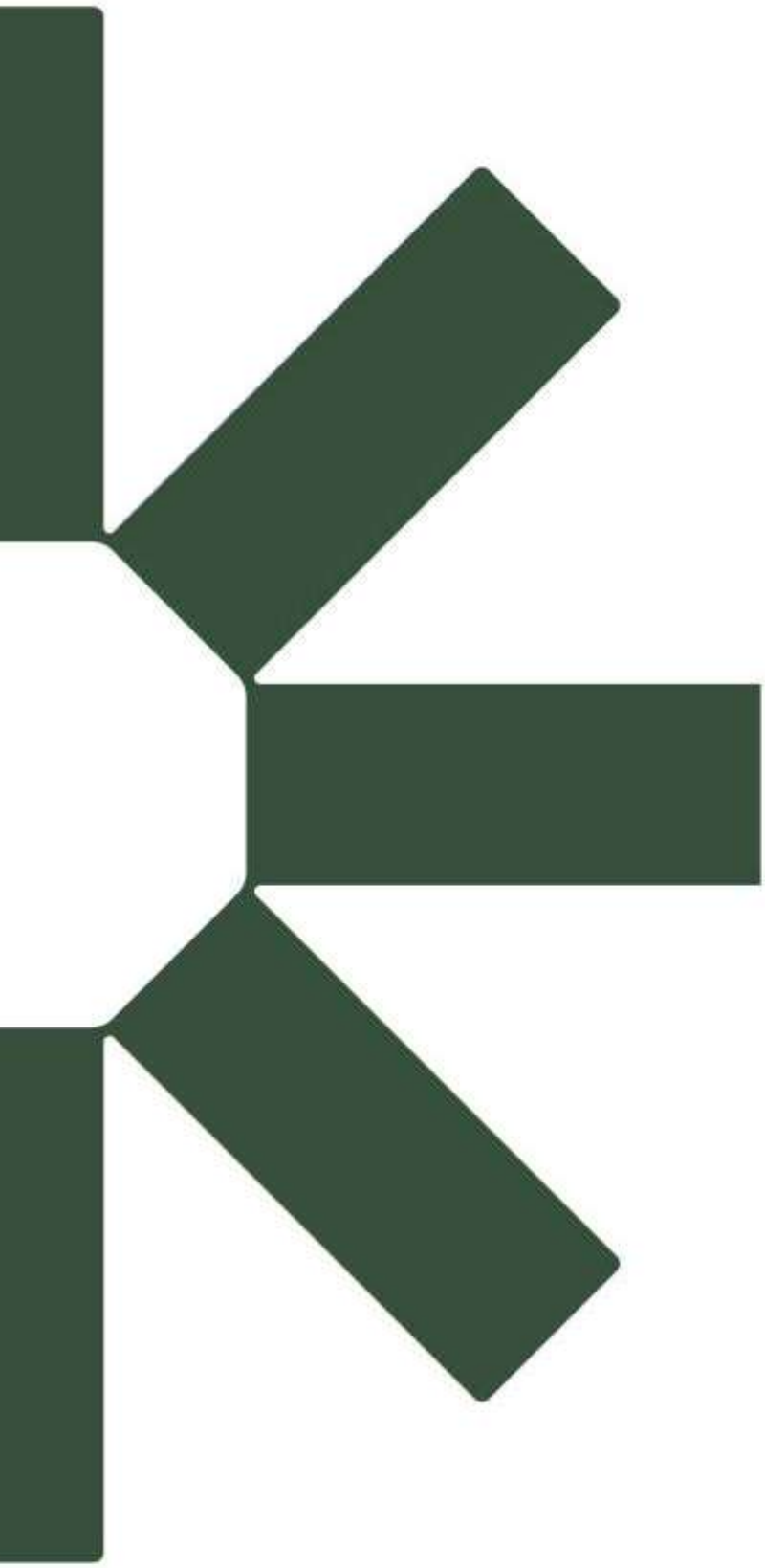

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