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Environmental and Social Impact Assessment (ESIA) for the Proposed Otjombinde Rural Water Supply Scheme project, Omaheke Region

Scoping Report

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Version - Final

November 2024

Ministry of Agriculture, Water and Land Reform

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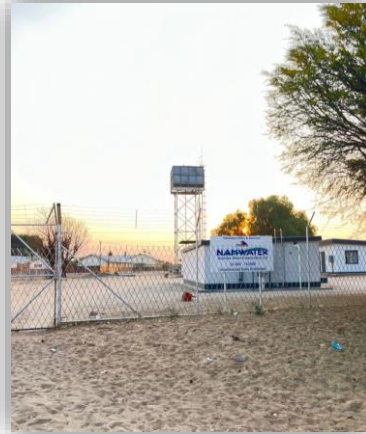
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MINISTRY OF AGRICULTURE,
WATER AND LAND REFORM



AFRICAN DEVELOPMENT BANK






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NON-TECHNICAL SUMMARY

1. Overview of project

The Otjombinde settlement is the district capital of Otjombinde constituency in the Omaheke region of Namibia. The constituency forms part of the border between Namibia and Botswana in the eastern central of Namibia. The Omaheke region has insufficient water resources for the large-scale development of Otjombinde constituency. Whilst some areas could be supplied with groundwater resources transferred from nearby schemes and potential wellfield development, water from outside of the region is required in the long term to supply the central portions of the Otjombinde Constituency. Due to the poor groundwater potential in most of the inhabited areas in the Otjombinde Constituency of the Omaheke Region, the Ministry of Agriculture, Water and Land Reform (“MAWLR”) is implementing various projects under the Namibia Water Sector Support Program (NWSSP) which aims to address the water supply and sanitation challenges that are affecting regions in the country. The program has identified the need for Otjombinde Rural Water Supply Schemes Project where there is the need to provide a water supply pipeline to convey good quality water in sufficient quantities to the rural communities in the study area, either from existing schemes (including NamWater schemes or from other sources).

The pressure from the population in the overgrazed upper catchment areas, where most of the livestock is concentrated, to move into the underdeveloped grazing areas in the east, is high and the MAWLR is forced to annually drill expensive and mostly unsuccessful boreholes in the remote grazing areas. The area is known to have a very low groundwater potential in most parts and a low rate of successful boreholes. The improvement of water supply through the construction of new groundwater schemes in areas with good groundwater potential and the connection of villages to existing schemes is proposed to bring relief in the short term. The population of the area is rapidly increasing and as a result the water demands of the constituency now significantly exceed the capacity of the existing aging scheme. The proposed development is thus needed in order to meet the ever-growing water demand within the Otjombinde constituency.

The proposed activities will trigger certain activities listed under the EIA Regulations (GN No. 30 of February 2012), and therefore cannot be undertaken without an EIA being undertaken. Ministry of Agriculture, Water and Land Reform (the proponent) has appointed GCS Water Environmental Engineering Namibia (Pty) Ltd (“GCS”) for conducting the Environmental and Social Impact Assessment (ESIA) process for the project.

The main objective of this ESIA is to determine the potential environmental and social risks and impacts emanating from the construction, operation, and decommissioning of the proposed development. The ESIA is required to ensure sound environmental management by MAWLR, comply with National legislation and policies and to meet the international funder standards for environmentally and socially sustainable development, as it is sponsored by the African Development Bank (AfDB).

The project must also meet the requirements of the Namibian Environmental Authorities. Relevant environmental and social data have been sourced from primary and secondary sources such as personal observations during site visits, and inputs from MAWLR officials, Tulipamwe Consulting Engineers, Lund Consulting Engineers, and stakeholders, including interested and affected parties (I&APs). Additional data was gathered through review of relevant literature and legal instruments.

This report constitute the scoping report which provides information to enable the Directorate of Water Affairs (DWA) and the Directorate of Environmental Affairs and Forestry (DEAF) to make informed decisions about the project.

The potential impacts and risks that could arise as a result of the proposed project have been identified based on existing sources of information and knowledge of the affected environment. Impacts specifically relating to social aspects, ecology and hydrology will be investigated and analysed in further detail at the ESIA stage. The preliminary list of potential impacts has been used to guide the type of specialist studies required in the ESIA. Mitigation measures have been proposed, however detailed mitigation measures for each impact identified will be outlined in the Environmental and Social Management Plan (ESMP). The following key potential impacts and risks have been preliminarily identified per project phase.

- Pre-Construction - Siting of scheme infrastructure, electricity/power availability/sufficiency, traffic flow, climate change and land use.
- Construction - Biodiversity disturbance and loss, surface and groundwater contamination, traffic, soil erosion, archaeological, health and safety, dust, noise, waste generation and disposal, temporary employment creation, disturbance of local residents and interruption of business activities.
- Operation - Soil, surface and groundwater, noise, health and safety, increased water supply, community unrest, migration, increased energy usage and waste. Positive impacts such as possible business opportunities and water security.
- Decommissioning - Noise and dust, health and safety risks, soil, surface and groundwater impacts, migration, community unrest and waste generation.

2. Mitigation measures

Phase 1: Planning and Design Management

- The proponent should appoint a Proponent's Representative (PR) that will act as their on-site implementing agent.
- This person should be responsible to ensure that the Proponent's responsibilities are executed in compliance with relevant legislation and this EMP.
- Vegetation should be cleared only where absolutely necessary and if cleared, numbers of protected, endemic and near endemic species` removed should be documented. Permits would be obtained for removal of protected species.

Phase 2: Construction Phase Management

- Hazardous and domestic / general waste must be disposed separately and at the appropriate facilities.
- Construction workers should be sensitised to dispose of waste in a responsible manner and not to litter.
- All run off materials such as wastewater and other potential contaminants should be contained on site and disposed of in accordance with municipal wastewater discharge standards, so that they do not reach to ground or surface water systems.
- Spill control preventative measures should be put in place to manage soil contamination.

Phase 3: Operational Phase Management

- Establish emergency procedures guidelines for the blockage/failure, flooding, contaminant removal and disinfection, power failure and fire of the scheme.
- MAWLR to attend to damage to the scheme components resulting in water loss as a matter of high priority.
- Used solvents and grease should be stored in drums or other suitable containers. It should be sealed and recycled or disposed at an appropriate disposal site.

Phase 4: Decommissioning Phase

- Employees appointed for decommissioning work must ensure that all personnel are aware of necessary health, safety, and environmental considerations applicable to their respective work.
- The contractor(s) should suppress dust associated with construction activities by using a reasonable amount of water as required.

- Contaminated soils onsite that may have resulted from leakage/spillage construction vehicles or equipment should be removed to a depth dependent on the size of the spill and replaced with clean soil. The contaminated soil should be removed and disposed at a designated landfill site suitable to receive contaminated soil.
- Upon completion of the decommissioning phase consultations should be held with the local community/property owner(s) regarding the post-construction use of remaining excavated areas (if applicable).

3. Consultations

The report was made available to the public and stakeholders for a 14-day comment period. The comments, together with the project team and proponent's responses thereto, is included in this Final Report.

The Final Report is herewith submitted to the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs and Forestry (MEFT: DEAF) before commencing with the ESIA phase.

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ABBREVIATIONS AND ACRONYMS	
AADD	Average Annual Daily Demand
AfDB	African Development Bank
BID	Background Information Document
CBD	Convention on Biological Diversity
DWSSC	Directorate of Water Supply and Sanitation Coordination
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ESA	Environmental and Social Assessment
ESIA	Environmental and Social Impact Assessment
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No 7 of 2007)
EMP	Environmental Management Plan
ESAP	Environmental and Social Assessment Procedures
ESMP	Environmental and Social Management Plan
GCS	GCS Water Environmental Engineering Namibia (Pty) Ltd
GLR	Ground Level Reservoir
GRM	Grievance Redress Mechanism
Ha	Hectares
HDI	Human Development Index
hrs	Hours
I&AP	Interested and Affected Parties
IUCN	International Union for Conservation of Nature
LFPR	Labour Force Participation Rate
LSU	Large Livestock Unit
km	Kilometers
kPa	Kilo Pascal

ABBREVIATIONS AND ACRONYMS	
kW	Kilowatt
m	Meters
m ³	Cubic meters
M ³ /d	Cubic meter per day
m ³ /h	Cubic meter per hour
mm	Millimeters
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT: DEAF	Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs and Forestry
mWh	Meters water head
NamWater	Namibia Water Corporation
PPP	Public Participation Process
SADC	Southern African Development Community
SR	Scoping Report
UNFCCC	United Nations Framework Convention on Climate Change
UNCCD	United Nations Convention to Combat Desertification

1 INTRODUCTION

Otjombinde settlement is the district capital of Otjombinde constituency in the Omaheke region. The constituency forms part of the of the border between Namibia and Botswana in the eastern central of Namibia. The Omaheke region has insufficient water resources for the large-scale development of Otjombinde constituency. Whilst some area could be supplied by with groundwater sources transferred from nearby schemes and potential wellfield development, water from outside of the region is required in a long term to supply the central portions of the Otjombinde Constituency. Due to the poor groundwater potential in most of the inhabited areas in the Otjombinde Constituency of the Omaheke Region, the Ministry of Agriculture, Water and Land Reform (“MAWLR”) is implementing various projects under the Namibia Water Sector Support Program (NWSSP) which aims to address the water supply and sanitation challenges that is affecting regions in the country. The program has identified the need for Otjombinde Rural Water Supply Schemes Project. Which sees the need to provide a water supply pipeline to convey good quality water in sufficient quantities to the rural communities in the study area, either from existing schemes (including NamWater schemes or from other sources). The pressure from the population in the overgrazed upper catchment areas, where most of the livestock is concentrated, to move into the underdeveloped grazing areas in the east, is high and the MAWLR is forced to annually drill expensive and mostly unsuccessful boreholes in the remote grazing areas. The area is known to have a very low groundwater potential in most parts and a low rate of successful boreholes. The improvement of water supply through the construction of new groundwater schemes in areas with good groundwater potential and the connection of villages to existing schemes is proposed to bring relief in the short term.

Ministry of Agriculture, Water and Land Reform (the proponent) has appointed GCS Water Environmental Engineering Namibia (Pty) Ltd (“GCS”) for conducting the Environmental and Social Impact Assessment (ESIA) process for the project. The ESIA is required to ensure sound environmental management by MAWLR and to meet the international funder standards for environmentally and socially sustainable development, as it is sponsored by the African Development Bank (AfDB). The project must also meet the legal requirements of the Namibian Environmental Authorities.

2 PROJECT AREA

The Otjombinde constituency is in the Omaheke region. The Otjombinde constituency forms part of the of the border between Namibia and Botswana in the eastern central of Namibia as depicted in **Figure 2-1**

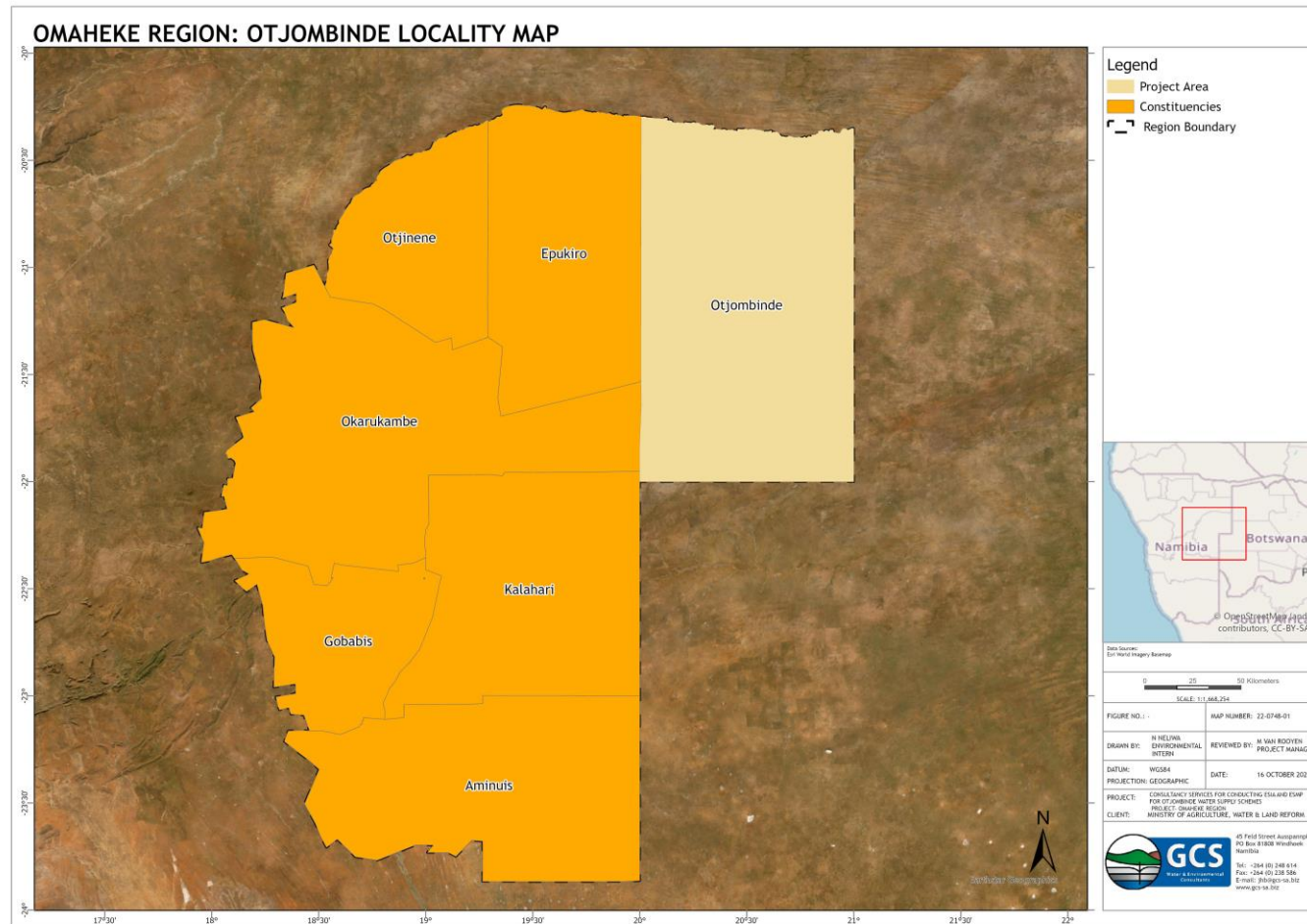


Figure 2-1: Locality Map for Otjombinde Constituency

3 PROJECT DESCRIPTION

The Proponent proposes to provide a water supply pipeline to convey good quality water in sufficient quantities to the rural communities. The water supply schemes that have been identified in the region that is associated with this EIA process are as follows:

1. Eiseb West Scheme - Development of a water supply scheme west of the Eiseb Graben;
2. Eiseb South Scheme - Development of a water supply scheme south of the Eiseb Graben;
3. Okarupuri Scheme - Development of a water supply scheme in the Okarupuri area; and
4. Talismanis - Rietfontein - Extension of the existing NamWater Scheme.

The detail associated with the proposed water supply schemes detailed above are provided in **Table 3-1**.

Table 3-1: Details of the proposed water supply schemes in the Otjombinde Constituency

Supply scheme	Proposed infrastructure	Supply area
Eiseb South	<ul style="list-style-type: none"> ✓ 3 x New boreholes with targeted yields of more than 7.5m³/h ✓ 1 x Pressed steel ground level reservoir ✓ 1 x Solar powered booster pump ✓ 5 x Watering point configurations (see Figure 3-2) Associated bulk and reticulation pipelines	Approximately 20ha (see Figure 3-2)
Eiseb West	<ul style="list-style-type: none"> ✓ 2 x New boreholes with targeted yields of more than 20m³/h ✓ 1 x Sectional steel ground level reservoir ✓ 1 x Solar powered booster pump ✓ 8 x Watering point configurations (see Figure 3-2) ✓ Associated bulk and reticulation pipelines 	Approximately 35ha (see Figure 3-3)
Okarupuri	<ul style="list-style-type: none"> ✓ 3 x New boreholes with targeted yields of more than 13.4 m³/h ✓ 1 x Pressed steel ground level reservoir ✓ 2 x Solar powered booster pumps ✓ 6 x Watering point configurations (see Figure 3-2) ✓ Associated bulk and reticulation pipelines 	Approximately 44ha (see Figure 3-4)
Talismanis - Rietfontein	Rehabilitate the civil infrastructure at 10 water points with urgent rehabilitation needs in the scheme	Talismanis - Lister - Rietfontein

It is understood that each water point will consist of an elevated tank receiving water from the bulk reticulation line and a metred manifold connection point from where water will be accessed. A schematic representation of the setup is provided in **Figure 3-1** below.

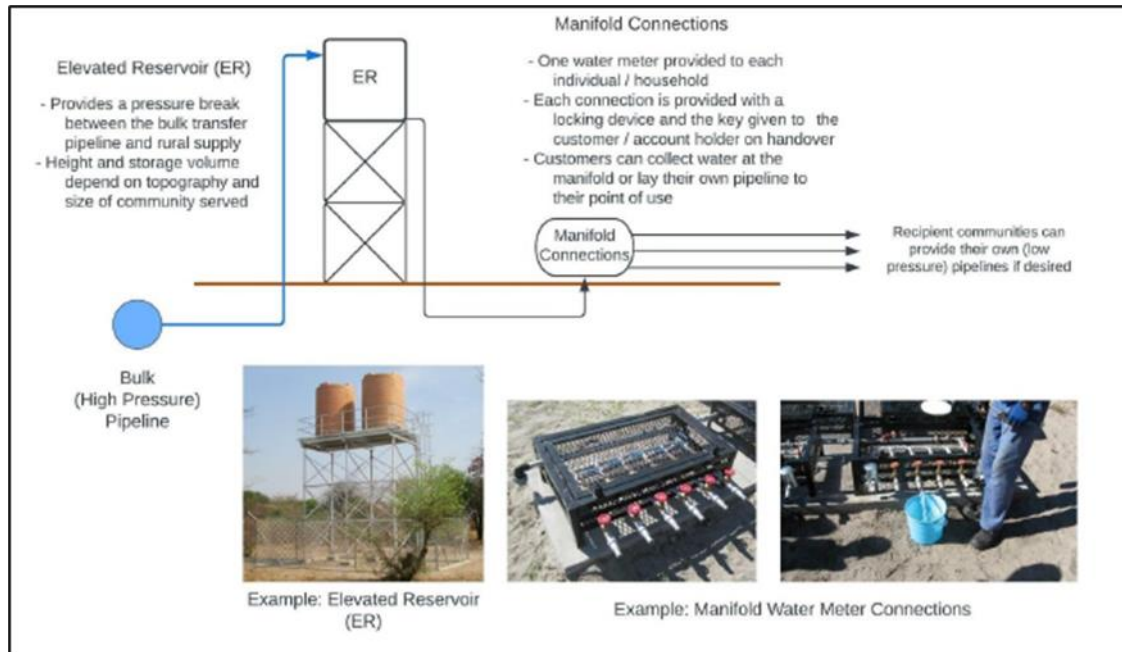


Figure 3-1: Schematic layout of the domestic water points within the schemes

The locality and overview of the proposed schemes can be seen on **Figure 3-2**, **Figure 3-3**, **Figure 3-4** and **Figure 3-5**.

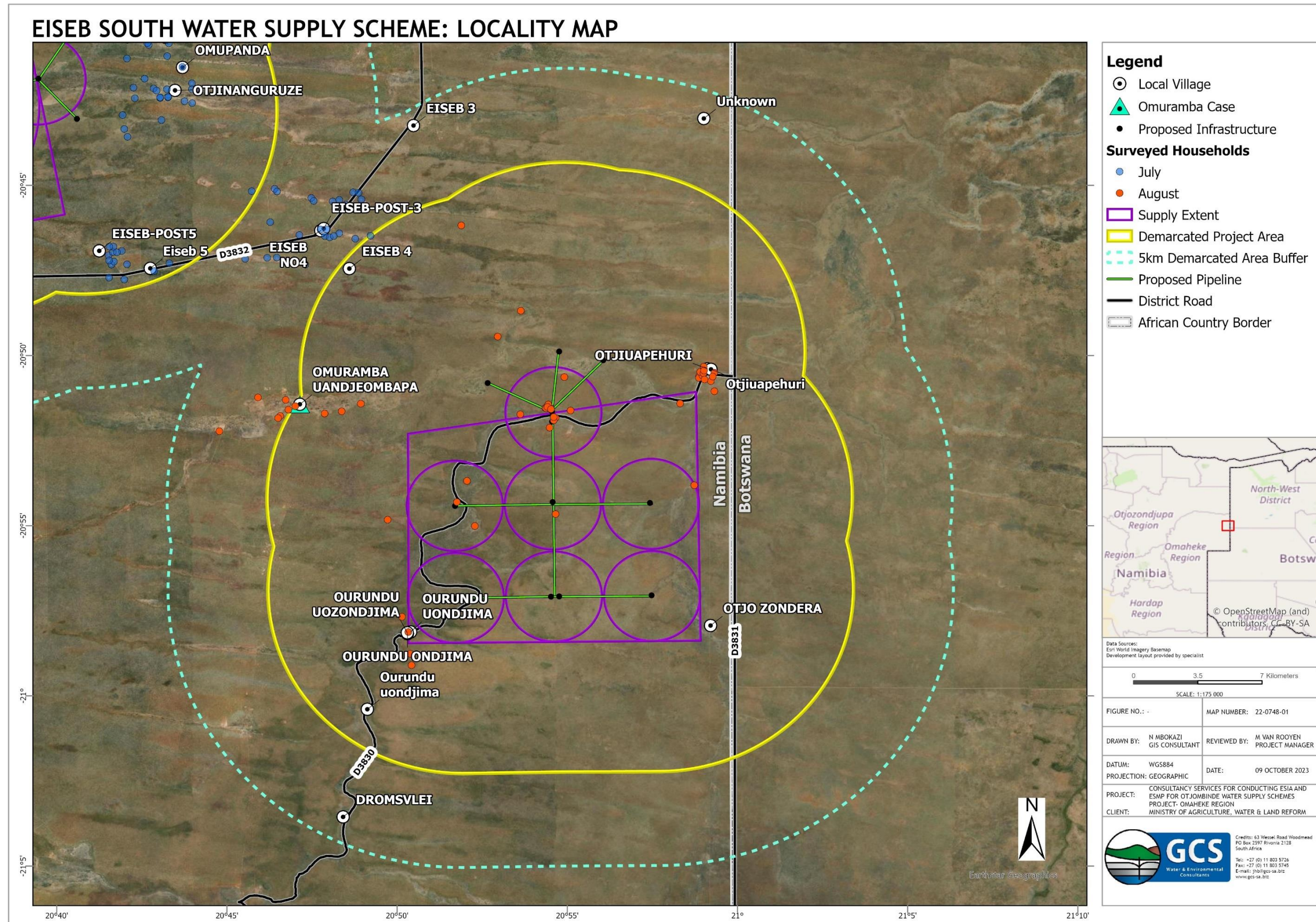


Figure 3-2: Locality of the proposed Eiseb South Water Supply Scheme

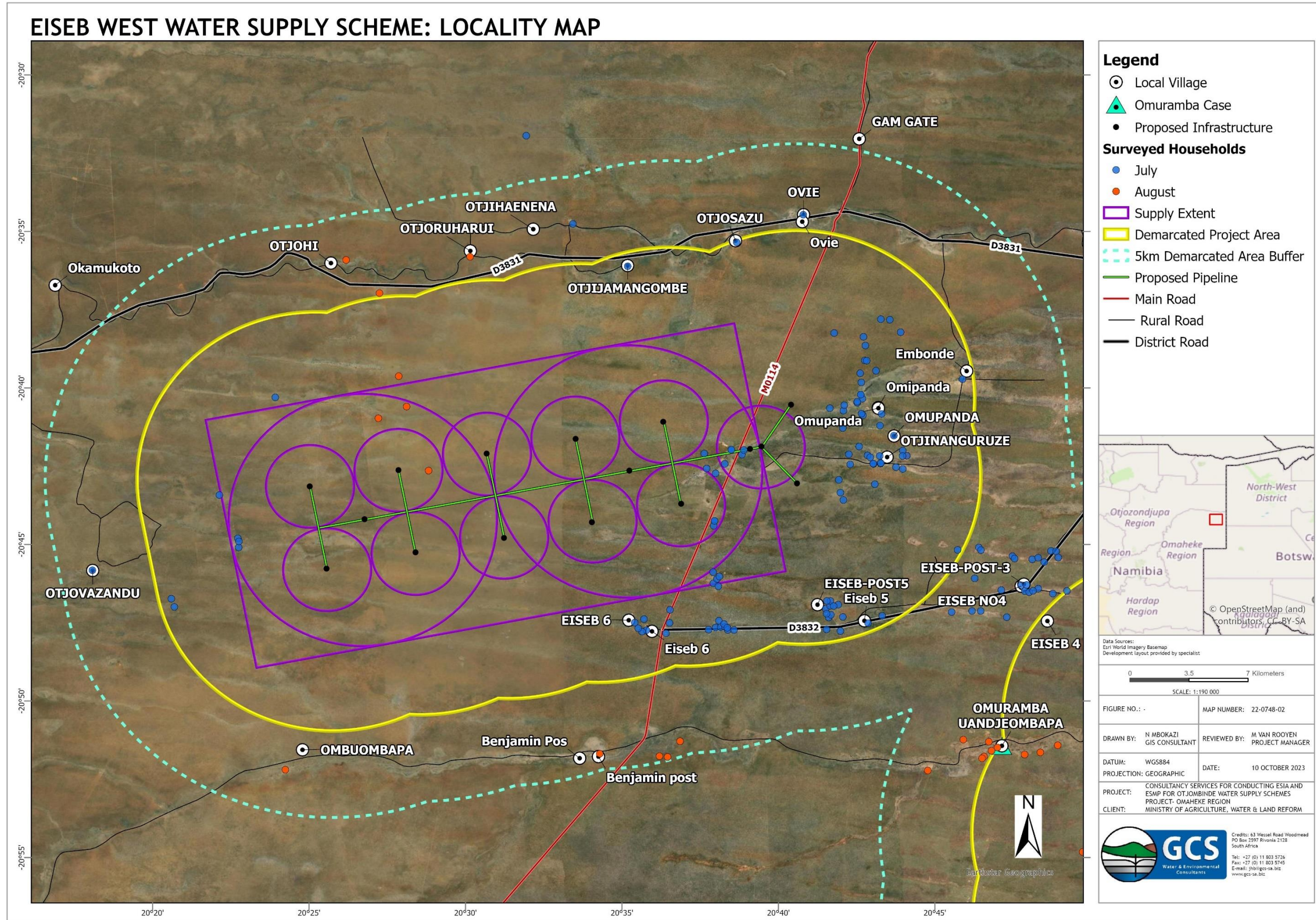


Figure 3-3: Locality of the proposed Eiseb West Water Supply Scheme

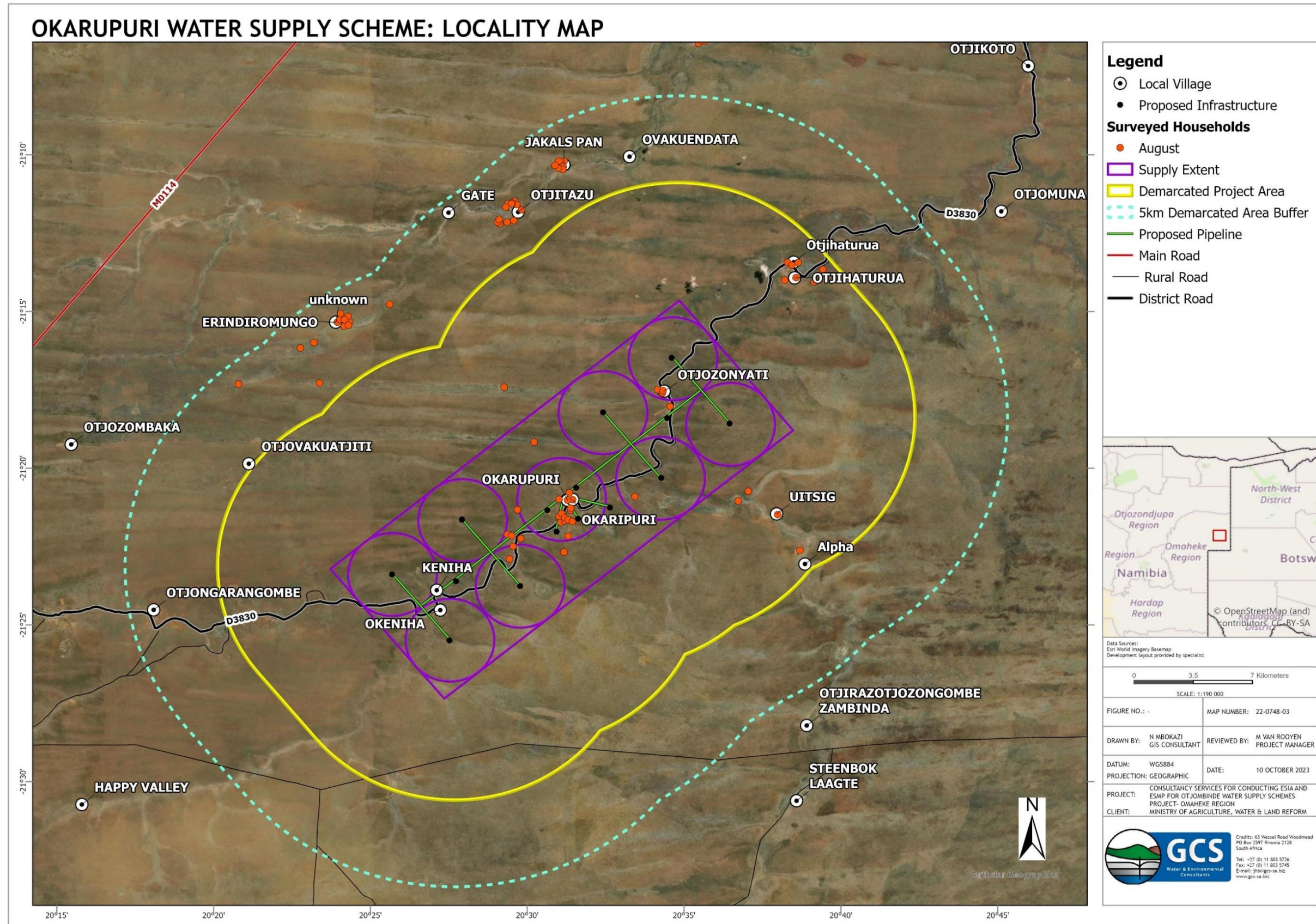


Figure 3-4: Locality of the proposed Okarupuri Water Supply Scheme

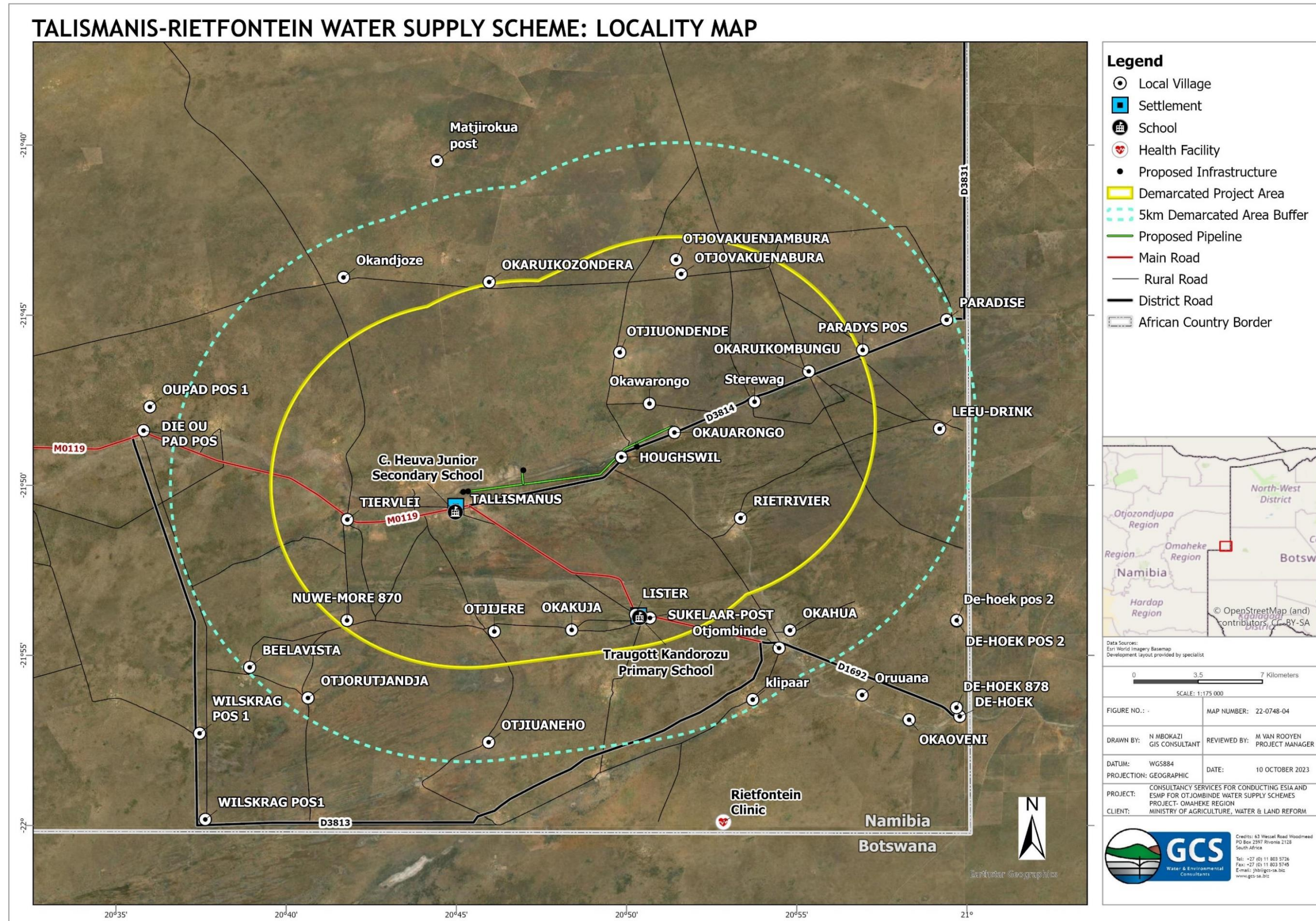


Figure 3-5: Locality of the Talismanis - Rietfontein - Extension of the existing NamWater Scheme

3.1.1 Overview of the existing Talismanis-Lister - Rietfontein NamWater scheme

Talismanis and Lister are two settlements situated in the Rietfontein Block, which NamWater supplies with bulk water mainly from Rietfontein. Talismanis is situated some 180 km east northeast of Gobabis and is a settlement / growth point identified by the ORC (2015). NamWater's scheme consists of five boreholes which pump into two sets of reservoirs at Lister. At Rietfontein, water is abstracted from three boreholes (WW 25762, WW 25763 and WW 26673) and pumped via a 7 km pipeline into a 100 m³ concrete ground level reservoir at Lister. For approximately 5 km, this pipeline consists of 160 mm diameter Class 6 uPVC pipes. At Lister itself, water is pumped from two boreholes (WW 10915 and WW 10914 (WW 100023)) either into the 100 m³ concrete ground level reservoir or into a 40 m³ elevated reservoir. From Lister, a booster pump station transfers water to the west towards a 130 m³ ground level reservoir Talismanis via an 11 km long, 160 mm diameter Class 6 uPVC pipeline. At Talismanis, a booster pump transfers water from the ground level reservoir into a 50 m³ elevated steel tank (Figure 3-6), approximately 10 m high (NamWater, 2004 and SCE, 2011).



Figure 3-6: Talismanis NamWater scheme

3.1.2 Overview of the proposed development

The project will focus on providing the necessary water supply infrastructure to meet the current and future water demands for the Omaheke region area, in Otjombinde constituency (Okarupuri, Tallismanus, Eiseb west and Eiseb South) all surrounding villages. The proposed new infrastructure will consist of the following:

3.1.2.1 Proposed Eiseb South Water Supply Scheme

The location identified with moderate groundwater potential is in the Rooiboklaagte Omiramba within the supply area identified. The grazing rangeland area of any water point in this area will overlap with a southern portion of the Ondero Farmers' Cooperative as well as a northern portion of the Otjozondera Farmers' Cooperative. A further difficulty arises from the perception that the grazing areas used by the San community might also be used by other non-San settlements, referring to the areas demarcated as red circles in **Figure 3-2**.

The settlement of Otjihuapehuri to the east of the registered land right of the San community is also an area/village occupied by the San and was identified by the Regional Office of the DWSSC as an area experiencing water supply problems.

Eiseb South Water Supply Scheme concept layout was developed by geographically locating the water supply infrastructure and related rangeland supply extent to avoid grazing area overlaps with the existing settlements of Eiseb 3,4 & 8, Omuramba Uandjou Ombapa, Orundu Uozondjima and Otjozondera (shown as red demarcated circles in **Figure 3-2**).

A 7.5 km rangeland offset was applied around these settlements as the current livestock numbers are unknown and should be confirmed from the demographic survey of the MAWLR/DWSSC. The overlaps with the Ondero and Otjozondera Farmer's Cooperatives should not be problematic as the rangeland around the nearest competing water points of these existing settlements does not overlap with the proposed supply extent of the Eiseb South Water Supply Scheme.

Should the expected borehole yield of approximately 7.5 m³/h/borehole be achieved from the newly drilled boreholes, the Eiseb South Water Supply Scheme can sustain a partially unused rangeland area of 19,975 ha, which was defined within the abovementioned supply extent limits and includes water supply to the community of Otjihuapehuri. The infrastructure proposed included:

1. 3 x New boreholes with targeted yields of more than 7.5m³/h
2. 1 x Pressed steel ground level reservoir
3. 1 x Solar powered booster pump
4. 5 x Watering point configurations
5. Associated bulk and reticulation pipelines

A preliminary water supply scheme network layout was developed, as shown in **Figure 3-7** below.

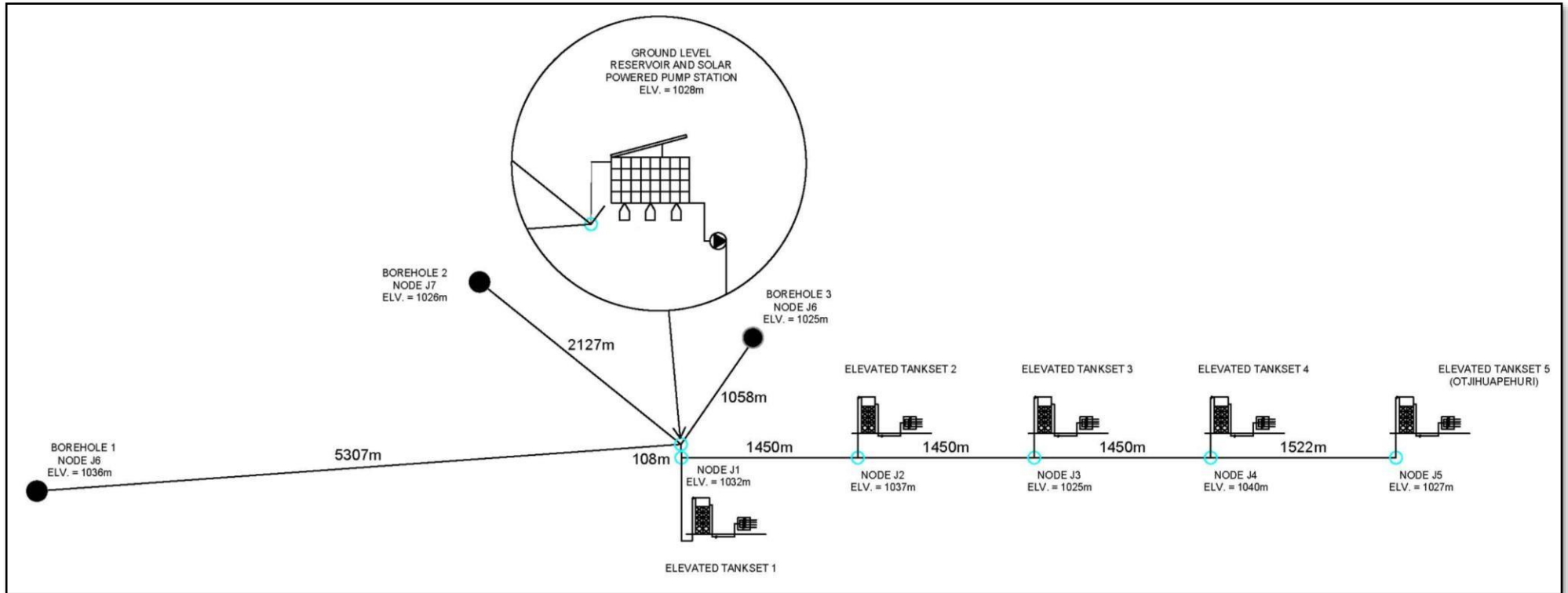


Figure 3-7: Schematic Layout of the Proposed Eiseb South Water Supply Scheme

3.1.2.2 Proposed Eiseb West Water Supply Scheme

With reference to **Figure 3-3**, the Eiseb West Water Supply Scheme concept layout was developed by determining the supply extent limits (illustrated in red and blue filled circles) to avoid grazing area overlaps with the linear settlement along the D2188 road in the Otjinoko Omiramba, Otjovazandu, Ombuombapa and Eiseb 6-northwards. A 7.5 km offset was applied from the D111 and the settlement (with unknown name) just north of Eiseb 6 on the D3301 road. For Otjovazandu, Ombuombapa and Eiseb 6, their required grazing area was calculated from the livestock numbers as per the data from the 2022 demographic survey carried out by the MAWLR/DWSCC.

According to the expected borehole yield of approximately 20 m³/h/borehole from the identified location on the eastern side of the D3301 road, two boreholes can sustain an area of 34,952 ha, which was defined within the abovementioned supply extent limits within the unused grazing area.

As illustrated in **Figure 3-3** and **Figure 3-8**, water will be abstracted from two boreholes and supplied into a 200.88 kℓ (m³) sectional steel ground level reservoir, from where water will be pumped to end users. The infrastructure proposed included:

1. 2 x new boreholes with targeted yields of more than 20m³/h
2. 1 x Sectional steel ground level reservoir
3. 1 x Solar powered booster pump
4. 8 x Watering point configurations
5. Associated bulk and reticulation pipelines.

A preliminary water supply scheme network layout was developed, as shown in **Figure 3-8** below.

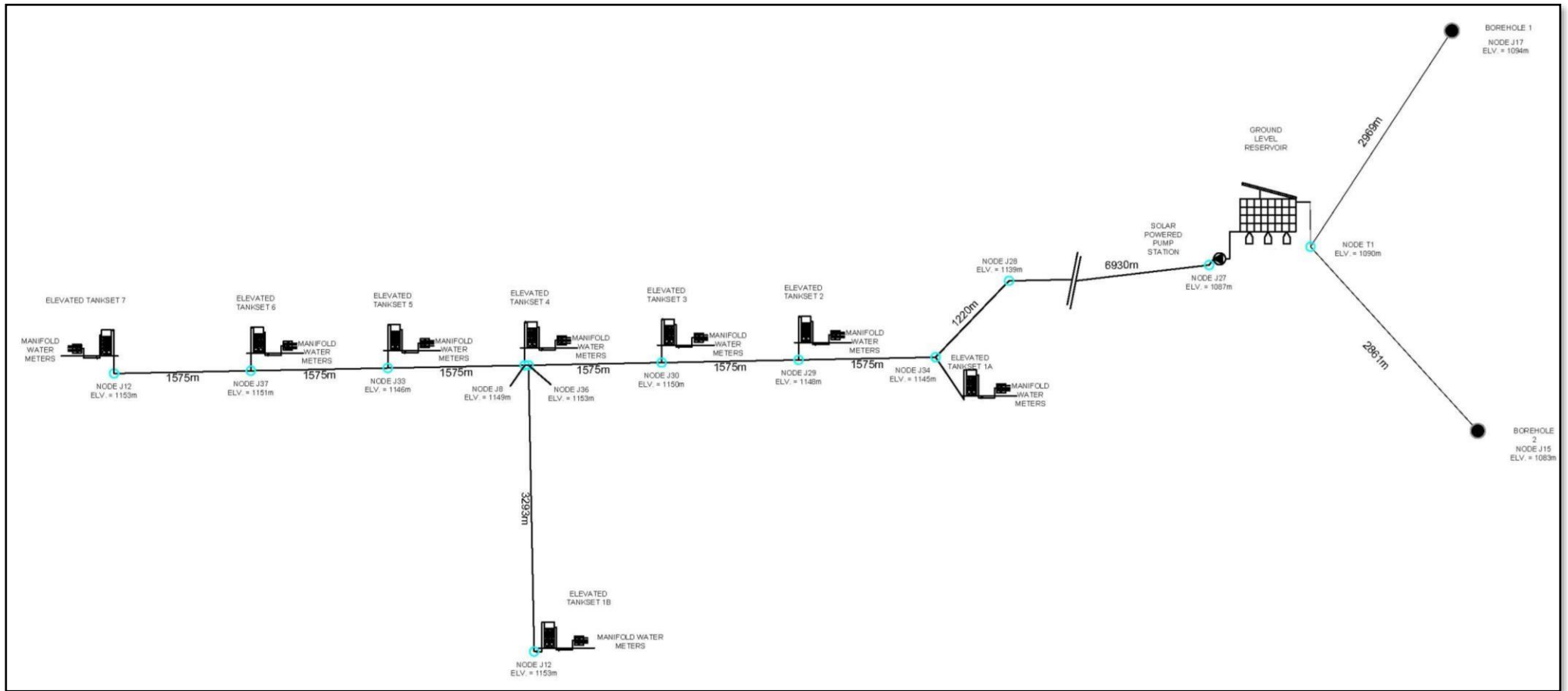


Figure 3-8: Schematic Layout of the Proposed Eiseb West Water Supply Scheme

3.1.2.3 Proposed Okarupuri Water Supply Scheme

The Okarupuri Water Supply Scheme is situated in the Epukiro Omiramba, centred to a certain degree between Okatumba Gate, Otjikoto (the existing Eiseb Water Supply Scheme) and Donkerbos.

The settlement of Ondimba was highlighted by the Regional Office of the DWSSC as a location experiencing water supply problems. The current population of Ondimba should be verified from the demographic survey of the MAWLR/DWSSC.

Taking the above into consideration, the Okarupuri Water Supply Scheme concept layout of 2016 was altered by omitting the northern portion of the water supply scheme and extending the main pipeline south-westwards to include the community of Ondimba. A population growth of 4% per annum to a horizon year of 2038 (15-year growth period) was provided for in the water demand calculations.

Should the expected borehole yield of approximately 13.4 m³/h/borehole be achieved from the newly drilled boreholes, the Okarupuri Water Supply Scheme can sustain a partially unused rangeland area of 26,671 ha around Okarupuri and could sustain the Ondimba community with a maximum of 128 people with 533 head of cattle (LSUs). The infrastructure proposed included:

1. 3 x New boreholes with targeted yields of more than 13.4 m³/h
2. 1 x Pressed steel ground level reservoir.
3. 2 x Solar powered booster pumps
4. 6 x Watering point configurations (see **Figure 3-1**)
5. Associated bulk and reticulation pipelines.

A preliminary water supply scheme network layout was developed, as shown in **Figure 3-9 below**.

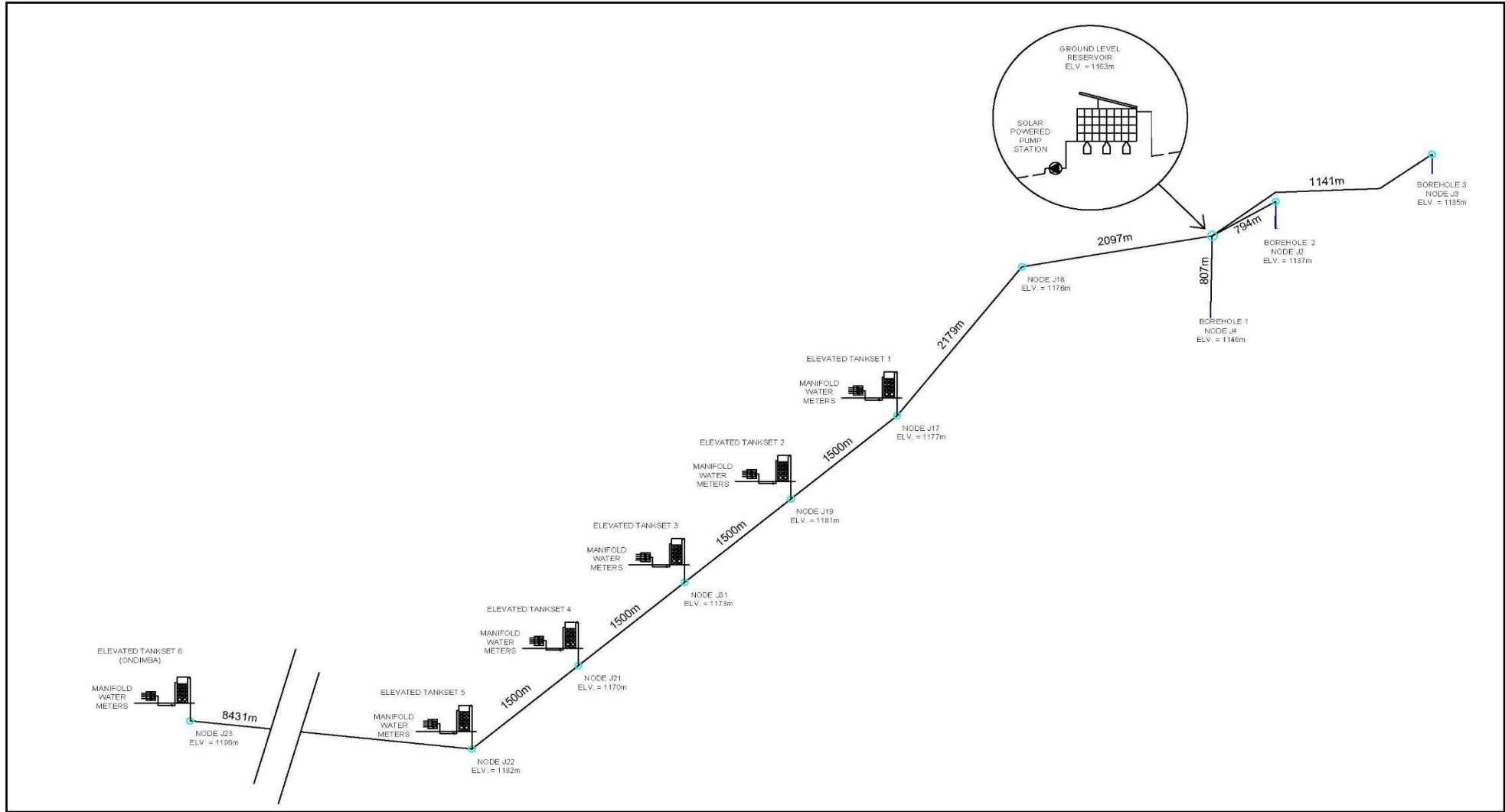


Figure 3-9: Schematic Layout of the Proposed Okarupuri Water Supply Scheme

3.1.2.4 *Proposals for Extending NamWater's Rietfontein-Lister-Talismanis Scheme*

Proposals were put forward to extend NamWater's Rietfontein-Lister-Talismanis Scheme by some 12.5 km to Okauarongo to the east of Talismanis, as shown in **Figure 3-5 above**. The infrastructure proposed included:

1. Rehabilitating borehole WW 10512 at Talismanis and installing it with an electric submersible pump (4 m³/h at 60 m);
2. Providing a new 65 m³ pressed steel ground level reservoir next to the borehole;
3. Providing a booster pump station (4 m³/h at 600 kPa) and constructing a pipeline to the east of Talismanis up to Okauarongo (approx. 12.5 km);
4. Providing storage reservoirs (2 x 10 m³ at 6 m height) at Welgeluk, Houghswil and Okauarongo;
5. Providing private off-take / manifold water meter installations with one to six private off- takes connected to the elevated reservoirs.

3.1.2.5 *Private Manifold Connections for Rural Communities*

The MAWLR have confirmed that the intention of the OWSP is to provide private manifold connections to the receiving communities in lieu of communal water points which were provided under previous rural water supply projects implemented by the DWSSC.

This system of private manifold connections was implemented under the DWSSC's Katima Mulilo- Kongola Water Supply Project, where the community expressed a preference for private / individual connections. Implementation was carried out under Phase 1 and Phase 2 of that project based on the following guidelines:

1. One metered connection per household or individual not part of a household;
2. Connections would be clustered in a manifold-type configuration:
 - a) Connections / manifolds would be clustered together in the area of a village;
 - b) Water meters would be located above ground, protected in a steel cage housing up to six water meters;
 - c) Multiple cages of six meters would be provided as/where required;
 - d) Not more than four cages with six meters each would be installed at one connection point to the pipeline;
3. The manifold water meters would be supplied via an elevated reservoir which serves to provide reserve storage and a pressure break between the bulk pipeline and manifold connections, based on the following guidelines:
 - a) Elevated reservoirs and manifolds were sited based on supply via own pipelines within a radius of 500 m (i.e. households / individuals were not expected to lay pipelines longer than 500 m);

- b) Storage provision would be sized for 48 hours' average daily demand at the end of the planning horizon (15 years);
- Multiples of 10 m³ polyethylene tanks would be used up to and including 40 m³ of required storage (4 tanks);
 - Volumes greater than 40 m³ would be provided via sectional steel reservoirs
- c) Elevated reservoirs would be located on stands 6 m high;
4. Each household or individual not part of a household would become a direct NamWater customer, with NamWater to read the water meter and bill that household / individual for their water consumption (take-over by NamWater still to be confirmed);
5. The DWSSC would provide all infrastructure up to the water meter of each household / individual and including a 2 m length of pipe to allow the filling of buckets / containers downstream of the water meter. Households / individuals would be responsible for laying a pipeline from "their" water meter to point of residence or use at their own time and cost. Due to the pressure break provided by the elevated reservoir, the system downstream would experience low pressures, thus allowing the use of low-pressure pipelines to reduce the pipeline costs to households / individuals.

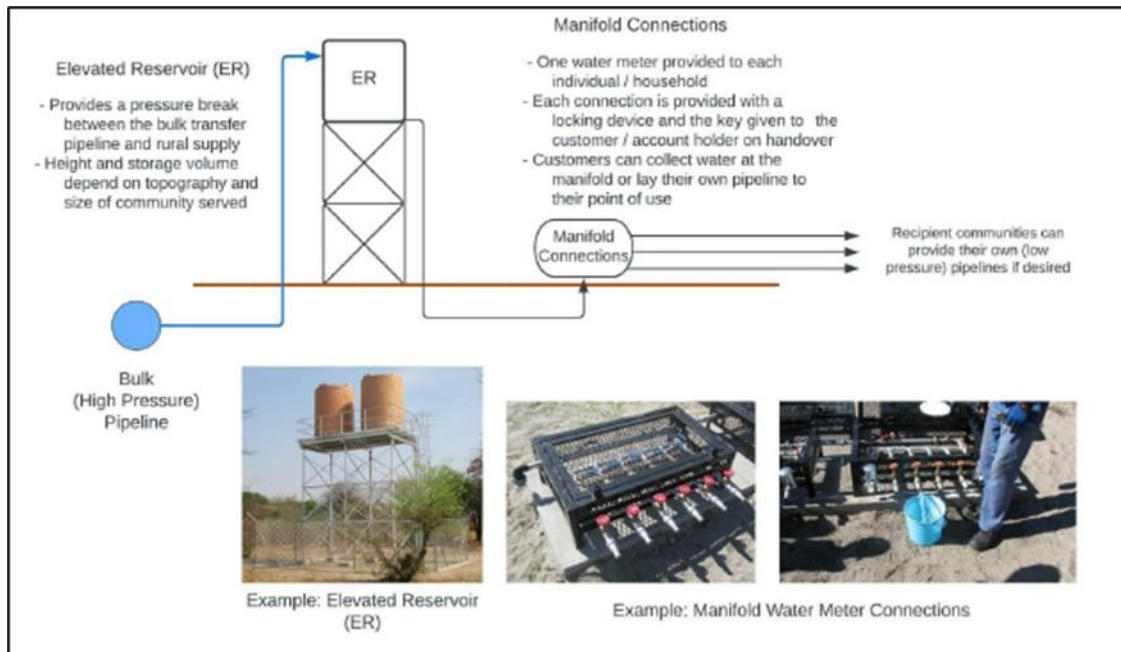


Figure 3-10: Schematic Representation of the Private Manifold Connections

3.1.3 Land Acquisitions and Wayleaves

All land in the Otjombinde Constituency is communally owned, with land in the southern third of the area surveyed, and that in the northern two thirds not. A resettlement farm is located east of Donkerbos, whilst small areas show individual or group registered communal land titles and the San Community Project is demarcated to the northeast of Otjikoto (Tulipamwe Consulting Engineers, 2022).

3.1.4 Water Abstraction Rights

MAWLR is required to have a valid water abstraction permit.

3.2 Project Need and Desirability

The areas that have been earmarked for the development of rural water supply schemes have been identified by the MAWLR as water stressed areas. To alleviate this water stress for the local population and the associated livestock, the development of these rural water supply schemes has been initiated.

The population of the area is rapidly increasing and as a result the water demands of the region now significantly exceed the capacity of the existing aging schemes resulting in very low reservoir storage levels and ongoing supply issues. The proposed development is thus needed in order to meet the ever-growing water demand within the town.

3.3 Project Design

The project involves the design of the required water supply infrastructure. The project is currently in the preliminary design stage, after which the detailed designs will be formulated for approval by MAWLR.

3.4 Construction Phase

3.4.1 Construction schedule

Construction is expected to take 28 months. Work will not necessarily be undertaken in a linear sequence as most of the activities can happen concurrently and in parallel, depending on the phasing of construction.

3.4.2 Pre-construction activities

The following activities will take place prior to construction once the necessary environmental authorisation, permits and/or licenses are in place:

- Wayleave applications where required;
- Land Acquisition processes (as required);
- Final design of plant and associated infrastructure.

3.4.3 Construction workforce

A mixture of unskilled temporary employees, semi-skilled and highly skilled employees will be required for construction. The unskilled labourers are generally trained by the contractors and sourced from local communities. All staff will be accommodated in rented accommodation in Tallismanus. The project is to adhere to the AfDB's Operational Standard (OS) No 5 with regards to Labour conditions and health and safety.

3.4.4 Construction camps and laydown areas

Construction site camps and laydown areas are to be sited in areas that are mostly disturbed i.e. lowest natural vegetation cover. Sensitive areas should be avoided.

3.5 Operation and Maintenance Phase

The operational phase refers to the operation of the proposed scheme and associated infrastructure of the various water supply schemes.

3.6 Decommissioning Phase

3.6.1 Decommissioning of the proposed new water supply schemes and associated infrastructure

The decommissioning phase refers to if/when the newly constructed infrastructure is decommissioned. Should this infrastructure be decommissioned in future, appropriate investigations and approvals need to be undertaken and obtained in line with the legislative framework at the time and mitigation measures need to be implemented to ensure environmentally friendly disposal of the infrastructure and effective rehabilitation of the affected areas. An EIA for the decommissioning process would have to be undertaken by the proponent. The EMP for the WTP will have to be reviewed at the time of decommissioning to cater for changes made to the site and implement guidelines and mitigation measures.

4 LEGISLATIVE AND POLICY FRAMEWORK

A review of applicable and relevant national and international legislation, policies and guidelines to the proposed development are given in this chapter. This review serves to inform the Proponent (MAWLR), Interested and Affected Parties and the decision makers at the DEAF of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled in order to undertake the proposed activities.

4.1 National Legislation, Policies, Guidelines, Plans and Strategies

4.1.1 *The Environmental Management Act No. 7 of 2007*

This scoping assessment was carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30). The EMA has stipulated requirements to complete the required documentation in order to obtain an Environmental Clearance Certificate (ECC) for permission to undertake certain listed activities. Under the Environmental Management Act (2007) and its Regulations (2012), an Environmental Impact Assessment (EIA) is required for:

8.2 *The abstraction of groundwater at a volume exceeding the threshold authorised in terms of a law relating to water resources.*

8.8 *The Construction and other activities in water courses within flood lines.*

8.11 *Alteration of natural wetland systems.*

10.1 *The construction of (a) oil, water, gas and petrochemical and other bulk supply pipelines.*

4.1.2 *The Water Resources Management Act (No. 11 of 2013)*

The Act provides for the management, development, protection, conservation and use of water resources, and established various regulatory and advisory institutions. Relevant principles of the Act include, inter alia:

- Equitable access for all people to safe drinking water is an essential basic human right to support a healthy productive life;
- Harmonisation of human water needs with the requirements of environmental ecosystems and the species that depend on them, while recognising that the water resource quality for those ecosystems must be maintained;
- Promotion of the sustainable development of water resources based on an integrated water resources management plan which incorporates social, technical, economic, and environmental issues;
- Development of the most cost-effective solutions, including conservation measures, to infrastructure for the provision of water; and

- Promotion of water awareness and the participation of persons having interest in the decision-making process should form an integral part of any water resource development initiative.

Furthermore, any watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the principles above. Impacts on water resources should be avoided. Mitigation measures must be included in the EMP to reduce impacts on watercourses that cannot be avoided. If required, the relevant permits must be applied for.

It should be noted that the act has not been promulgated yet. However, the Department of Water Affairs does apply the water quality standards as outlined in the draft Regulations and as such the development is to comply with these standards.

The full list of all applicable national legislation identified and conducted during the EIA process are presented in **Table 4-1** below.

Table 4-1: Applicable national legislation

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Environmental Management Act (EMA) No. 7 of 2007	Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). Details principles which are to guide all EAs.	The EMA and its regulations should inform and guide this EIA process.
Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)	Details requirements for public consultation within a given environmental assessment process (GN 30 S21). Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).	
The Constitution of Namibia Act No. 1 of 1990	According to Legal Assistance Centre (LAC), there is no clear right to health in the Namibian Constitution. But under the Article 95 of the Namibian Constitution that deals with Principles of State Policy, the Namibian Constitution states, “the state shall enact legislation to ensure consistent planning to raise and maintain an acceptable standard of living for the country’s people” and to improve public health.	The Proponent should ensure compliance with the conditions set in the Act.
Water Act No. 54 of 1956	The Water Resources Management Act 11 of 2013 is not yet promulgated; therefore, the Water Act No 54 of 1956 is still in force:	The protection of ground and surface water resources should be a priority during the proposed activities.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<ul style="list-style-type: none"> • Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)). • Provides for control and protection of groundwater (S66 (1), (d (ii))). <p>Liability of clean-up costs after closure/abandonment of an activity (S3 (l)).</p> <p>The Guidelines for the Evaluation of drinking-water quality for human consumption with regards to chemical, physical, and bacteriological quality requires that; water supplied for human consumption must comply with the officially approved guidelines for drinking-water quality. For practical reasons, the approved guidelines have been divided into three basic groups of determinants, namely:</p> <ul style="list-style-type: none"> • Determinants with aesthetic implications: TABLE 1. • Inorganic determinants: TABLE 2. • Bacteriological determinants: TABLE 3. <p>The water quality for human consumption is classified into three groups. The concentration of and limits for the aesthetic, physical and inorganic determinants define the group into which water will be classified.</p>	<p>The schemes should adhere to the standards for water quality for human consumption as per the act.</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<ul style="list-style-type: none"> • Group A: Water with an excellent quality • Group B: Water with acceptable quality • Group C: Water with low health risk • Group D: Water with a high health risk, or water unsuitable for human consumption 	
Water Resources Management Act No.11 of 2013	<p>The act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to:</p> <p>Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68).</p> <p>The draft Regulations of the Act outline the water quality guidelines and standards for potable water and effluent disposal</p>	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
The Water Policy for Namibia (2000)	Water sector reform, according to the policy, should be a continuous process. Policy development is a dynamic process that must consider societal and technological changes. According to the policy, the development and management of water services in Namibia have centred on the construction and operation of supply delivery systems to meet the needs of various users. Large dams, canals, major pipelines, pumping stations, and water treatment works are among the more sophisticated structures and systems.	Recognizing the importance of continuous improvement of water supply, management, conservation, and sanitation issues in Namibia, the adoption of some of the best technology in water and wastewater management would be facilitated by the implementation of WSSP. The Otjombinde Rural Water Supply Scheme's main task is to build efficient bulk water supply systems in the Omaheke Region.
The Integrated Water Resource Management Plan (2010)	To achieve social, environmental, and economic growth in Namibia, the Plan promotes coordinated management and use of water, land, and related services. In Namibia, the overall long-term goal of IWRM is to establish a sustainable water resources management regime that promotes social equity, economic efficiency, and environmental sustainability.	The implementation of the Otjombinde Rural Water Supply Scheme is consistent with the goals of Namibia's IWRM Plan, as the program ensures social equity and economic efficiency in water management.
Namibia Water Corporation Act 12 of 1997	To establish the Namibia Water Corporation Limited; to regulate its powers, duties, and functions; to provide for a more efficient use and control of water resources; and to provide for incidental matters.	The Proponent is to carry out their functions as per the Act.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<p>Without prejudice to the generality of section 5, the Corporation shall perform the following functions in pursuit of its objects under this Act, namely - (a) Explore, develop, and manage water resources for the purpose of water supply. (b) Acquire, plan, design, construct, extend, alter, maintain, repair, operate, control, and dispose of waterworks. (c) Subject to section 7 and notwithstanding any provisions of the Water Act to the contrary, supply water to customers within and outside the borders of the Republic of Namibia. (d) Investigate, research and study matters relating to water resources, waterworks, and the environment. (e) Take such action as the Corporation may consider necessary or as the Minister may direct, for the purposes of conserving or augmenting water resources in Namibia. (f) Render services, provide facilities, and lease rights, subject to the payment of relevant charges. (g) establish training facilities and train personnel; and (h) Perform any other function as may be necessary or expedient for the achievement of the Corporation's objects.</p>	
Soil Conservation Act No. 76 of 1969	<p>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.</p>	<p>Duty of care must be applied to soil conservation and management measures must be included in the ESMP.</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Nature Conservation Ordinance No.4 of 1975	To consolidate and amend the laws relating to the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.	The Proponent should ensure that their activities do not in any way compromise the wildlife in the area of operations and the ordinance requirements are adhered to.
Forestry Act No. 12 of 2001	<p>The Act provides for the management and use of forests and related products / resources. It offers protection to any living tree, bush or shrub growing within 100 metres of a river, stream or watercourse on land that is not a surveyed erven of a local authority area. In such instances, a licence would be required to cut and remove any such vegetation.</p> <p>These provisions are only guidelines.</p>	Should there be a need to remove vegetation on site, a permit to remove protected species will need to be obtained from the Forestry office.
Atmospheric Pollution Prevention Ordinance No. 11 of 1976	This ordinance provides for the prevention of air pollution.	Measures should be instituted to ensure that dust emanating from construction activities is kept at acceptable levels.
Public Health Act No. 36 of 1919	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	The Proponent and all its employees / contractors should ensure compliance with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labourers.	

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Labour Act No. 6 of 1992	Ministry of Labour (MOL) is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act no. 6 of 1992.	The Proponent should ensure that the proposed activity does not compromise the safety and welfare of workers.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council.	The development must comply with provisions of the Local Authorities Act as well as the municipal bylaws and regulations applicable to the project.
National Heritage Act No. 27 of 2004	The Act is aimed at protecting, conserving and registering places and objects of heritage significance.	All protected heritage resources (e.g., human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.
Roads Ordinance 17 of 1972	<ul style="list-style-type: none"> • Section 3.1 deals with width of proclaimed roads and road reserve boundaries • Section 27.1 is concerned with the control of traffic on urban trunk and main roads • Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads <p>Section 37.1 deals with Infringements and obstructions on and interference with proclaimed roads.</p>	Adhere to all applicable provisions of the Roads Ordinance.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Nature Conservation Ordinance no. 4 of 1975	<ul style="list-style-type: none"> Chapter 6 provides for legislation regarding the protection of indigenous plants 	Indigenous and protected plants must be managed within the legal confines.
Hazardous Substance Ordinance 14 of 1974	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	Chlorine and other hazardous substances must be handled in accordance with the respective MSDS from suppliers.
Pollution Control and Waste Management Bill	To promote sustainable development; to provide for the establishment of a body corporate to be known as Pollution Control and Waste Management Agency; to prevent and regulate the discharge of pollutants to the air, water and land; to make provision for the establishment of an appropriate framework for integrated pollution prevention and control; to regulate noise, dust and odour pollution; to establish a system of waste planning and management; and to enable Namibia to comply with its obligations under international law in this regard.	The disposal of waste is to adhere to the guidelines as per the bill.
National Policy on Climate Change for Namibia 2010	The main purpose of the national climate change policy of Namibia is to provide the legal framework and overarching national strategy for the development, implementation, monitoring and evaluation of climate change mitigation and	The project is to consider climate change and its impact on water resources.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	<p>adaptation activities. The policy promotes the enhancement of synergies amongst sectors and stakeholders for effective and efficient mitigation and adaptation responses to climate change in Namibia. In addition, the policy facilitates identification of sector and cross-cutting climate change strategies and actions for implementation to lower Namibia's overall risks, and the risks of the most vulnerable groups and sectors. The policy also provides legal basis for resource mobilisation to address climate change adaptation and mitigation.</p>	
<p>Namibian National Gender Policy 2010-2020</p>	<p>The Namibia National Gender Policy (2010-2020) seeks to create an enabling environment for sectors to mainstream gender in line with National Development Plans (NDPs). It identifies who will be responsible for the implementation of the policy and who will be accountable for gender equality results. The policy further highlights the enhancement of the role and benefits of women in the environment.</p>	<p>The project is to consider the role of women in the environment and to ensure that interested and affected women are represented and consulted.</p>
<p>National Biodiversity Strategy and Action Plan (NBSAP2) 2013-2022</p>	<p>The action plan was implemented to raise awareness of the critical importance of biodiversity conservation in Namibia, bringing together the management of ecosystem protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.</p>	<p>The proposed Otjombinde Rural Water Supply Scheme activities, particularly construction and civil works, have the potential to endanger the ecosystem.</p>

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
National Policy on HIV & AIDS (2007)	The policy aims to provide a supportive environment for the implementation of programmes aimed at reducing the infections, improving care and treatment and mitigation of impacts inadeptly supporting vision 2030. Objectives 4, 6 7 and 8 are important to the project in that they drive towards fair opportunities, treatment and access to services that facilitate mitigation for those infected or affected by HIV/AIDS.	The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections.
National Land Policy	The policy hinges its principles on the fundamental human rights enshrined in the constitution and aims to overcome inequalities in the land delivery system to enable access by the poor and disadvantaged of a society. The policy further recognises the fate of informal settlement in urban areas and a multisectoral approach to making land available to those displaced in the process of formalisation of urban land. Where access to land is denied for the poor and marginalised persons of the society, this is considered a violation of the fundamental rights enshrined by the constitution and thus necessitates remedial course through legislative provisions.	The proponent should consult with the landowners and or traditional authorities or relevant land users to obtain a written land use/leasehold agreement prior to constructing infrastructure. Proper consultations should be done with the affected landowners and authorities with regards to land use and the project activities.
The National Disability Policy	The national disability policy points to equal opportunities for persons with disabilities to have a productive and gainful employment in the labour market. Moreover, addresses that person living with disability should be safeguarded from abuse and violence. Such provides that where there is discrimination	The project is to consider equal opportunities for persons with disabilities to have a productive and gainful employment in the labour market.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
	purported towards persons with disability, such causes need for remedy.	

4.2 International Treaties and Conventions

4.2.1 UN Convention on Biological Diversity of 1992

The Convention on Biological Diversity (CBD) is an international legally binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources. It regulates or manages biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. The proposed development activities excavations and civil works of bulk water infrastructure should conserve biodiversity, the removal of vegetation cover and destruction of natural habitats should be avoided and where not possible it should be minimised.

4.2.2 International Union for Conservation of Nature

The International Union for Conservation of Nature (IUCN) provides public, private and non-governmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together. The mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

4.2.3 United Nations Convention to Combat Desertification

The United Nations Convention to Combat Desertification (UNCCD) addresses land degradation in arid regions with the purpose to contribute to the conservation of biodiversity and the mitigation of climate change. The proposed project activities should be such that they do not contribute to desertification.

4.2.4 African Convention on Conservation of Nature and Natural Resources

This Convention focuses on living resources, calling for the creation of protected areas and for the specific conservation measures for listed species. It also provides the grounds for the conservation of other natural resources such as soil and water, for the consideration of environmental concerns in development plans, and for research and education. The proposed activities will have a direct impact on the natural resources by clearing of vegetation, loosening soils during trenching activities. Thus, the requirements of this convention must be considered in the implementation of the project.

4.2.5 United Nations Framework Convention on Climate Change in 1995

In 1995 Namibia ratified the United Nations Framework Convention on Climate Change (UNFCCC); an international environmental treaty. The ultimate objective of the Convention is to “stabilise greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.” The proposed activities should be such that they do not contribute to climate change impacts.

4.2.6 *The Southern African Development Community (SADC) Protocol on Shared Watercourse Systems*

The SADC Protocol on Shared Watercourse Systems provides that permits must be acquired before discharging any and all types of wastes into shared waters, provided that the intended discharge will not have a detrimental effect on the watercourse system; member states must furthermore take all measures necessary to prevent the introduction of alien aquatic species into a shared watercourse system which may have detrimental effects on the ecosystem; and agreements should be reached on water control and utilisation in shared watercourse systems including the regulation of the flow and drainage.

4.3 International Financial Institution Standards and Policies

4.3.1 *The African Development Bank (AfDB) Integrated Safeguards System (ISS) 2013*

To better articulate its safeguard policies while improving their clarity, coherence and consistency, the Bank has developed an Integrated Safeguards System (ISS). The Bank Group's Integrated Safeguards System (ISS) and its related Climate Safeguards System (CSS) are the strategic tools to ensure that Bank supported operations are designed in a sustainable manner. The Bank's ISS composed of Operational Safeguards, ESAP/Business Standards and Guidelines which apply to all Bank financed projects. A basic requirement of the Bank ISS is that all project must comply with the legislation, regulations, national and sub-national requirements and international agreements of project host countries on all issues related to project preparation and implementation.

4.3.1.1 *The African Development Bank (AFDB) Environmental and Social Assessment Procedures (ESAP) 2015*

The ESAPs purpose is to improve decision making and project results by ensuring that Bank-financed operations conform to the requirements laid out in the Operational Safeguards (OSs) and are thus sustainable. It details the specific procedures that the Bank and its borrowers or clients should follow to ensure that Bank operations meet the requirements of the OSs at each stage of the Bank's project cycle. It is with this goal in mind that the ESAP require that environmental, climate change and social considerations are assessed early in the Project Cycle and are reflected in project selection, site selection, planning and design. To fulfill the environmental and social obligations as defined in financial agreement, and meet both the relevant national borrower and financier (AfDB), and international legal and policy requirements.

The Environmental and Social Assessment (ESA) process outlined in the ESAP provides a way to improve a project environmentally, socially and in relation to climate change and gender as cross cutting issues, thereby enhancing its benefits and - in order of priority - avoiding, minimizing, mitigating or compensating for adverse impacts. The ESA process also seeks to ensure that access to benefits is sufficiently broad, that information in a suitable form is disclosed in a timely manner and that the borrower engages in meaningful consultation (i.e., consultation that is free, prior and informed) with local stakeholders and potentially affected communities; in particular, with vulnerable groups, to enable them to participate actively in decisions about avoiding or managing environmental and social impacts.

4.3.1.2 *The African Development Bank (AFDB) Operational Safeguards (OS)*

The AfDB ISS requirements is composed of 5 Operational Safeguard (OS) requirements that clients are expected to meet when addressing social and environmental impacts and risks which include:

No.	Operational Safeguard	Description	Applicability to the Project
1	Environmental and social assessment	Governs the process of determining a project's environmental and social category and the resulting environmental and social assessment requirements. Requires the borrower/client to establish a "credible, independent and empowered local grievance and redress mechanism to receive, facilitate and follow up on the resolution of the affected people's grievances and concerns regarding the environmental and social performance of the project.	The grievance form is provided to stakeholders that can put a grievance should they feel it required.

2	Involuntary resettlement: land acquisition, population displacement and compensation	Consolidates the policy commitments and requirements set out in the Bank's policy on involuntary resettlement, and incorporates a number of refinements designed to improve the operational effectiveness of those requirements.	Consultation is done with and occupier or owners and no involuntary resettlement will take place.
3	Biodiversity, renewable resources and ecosystem services	Aims to conserve biological diversity and promote the sustainable use of natural resources. It also translates the commitments in the Bank's policy on integrated water resources management into operational requirements	To protect the local water resources for better water resource management it is required to complete this project to ensure that there is sufficient water for the communities, without depleting the natural resources in one area.
4	Pollution prevention and control, hazardous materials and resource efficiency	Covers the range of key impacts of pollution, waste, and hazardous materials for which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, including greenhouse gas accounting, that other multilateral development banks follow.	This is not a constant waste generation activity. The Environmental Management Plan sets out the procedures of how generated waste will be handled.
5	Labour conditions, health and safety	Establishes the Bank's requirements for its borrowers or clients concerning workers' conditions, rights and protection from abuse or exploitation.	Labour will be dealt with in compliance with the AFDB and National labour laws.

4.3.1.3 The African Development Bank (AFDB) Safeguard Policies and Strategies

The Bank's several related policies and tools indicate its commitment to improving environmental and social sustainability in its investments. The bank policies which were developed prior to the ISS are outlined below:

- Policy on the environment - established the Bank's commitment to integrating environmental considerations into its operations through (i) systematic project categorisation according to the level of environmental risk, and (ii) the application of appropriate types of environmental assessments, with commitments to public consultation and information disclosure.
- Involuntary resettlement policy: The primary goal of the involuntary resettlement policy is to ensure that when a Bank intervention requires people to be displaced, they are treated equitably and share in the benefits of the project that involves their resettlement, improving their living standards.
- Gender policy - to promote gender mainstreaming as a means of fostering poverty reduction, economic development and gender equality on the continent. The policy elaborates a set of guiding principles, which emphasise, among other things, the need to apply gender analysis to all Bank activities. It also recognises that the concept of gender implicitly embodies a culture which entails cooperation and interdependence between women and men.
- Climate risk management and adaptation (CRMA) strategy - The overall goal of the Bank's strategy is to ensure progress towards eradication of poverty and contribute to sustainable improvement in people's livelihoods taking into account CRMA. The specific objectives are: (i) To reduce vulnerability within the RMCs to climate variability and promote climate resilience in past and future Bank financed development investments making them more effective; (ii) To build capacity and knowledge within the RMCs to address the challenges of climate change and ensure sustainability through policy and regulatory reforms.

5 ESIA PROCESS AND APPROACH

The flow diagram in **Figure 5-1** provides an outline of the ESIA¹ process that is being followed for the proposed project.

5.1 Screening Phase

The screening phase involved a high-level screening and assessment of the general study area to determine constraints and opportunities associated with the project. It further involved assessing whether an EIA is required to be undertaken for the proposed activity. Under the 2012 Environmental Impact Assessment (EIA) Regulations of the Environmental Management Act (EMA) No. 7 of 2007, the proposed development is a listed activity that may not be undertaken without an Environmental Clearance Certificate (ECC). This activity is listed under the following relevant sections:

8.2 The abstraction of groundwater at a volume exceeding the threshold authorised in terms of a law relating to water resources

8.8 The Construction and other activities in water courses within flood lines.

8.11 Alteration of natural wetland systems

10.1 The construction of (a) oil, water, gas and petrochemical and other bulk supply pipelines.

5.2 Scoping Phase

The scoping phase involves the identification of significant issues and impacts focusing the impact assessment by refining alternatives; identifying national legal context and financial institution safeguard requirements to ensure that the ESIA meets the requirements of decision-makers and lenders; defining the approach to the ESIA in the Terms of Reference for the ESIA; and gathering stakeholder opinions about the project.

During the scoping phase the draft Scoping Report (SR) will be made available to the public for review and comment after which it will be updated and finalised, taking cognisance of the comments received from I&APs. The final Scoping Report will then be submitted to MEFT: DEAF for review and decision-making, before commencing with the ESIA Phase.

5.3 ESIA Phase

The ESIA Phase assesses the significance of the potential impacts identified during scoping. The assessment process will identify mitigation measures to avoid or reduce negative impacts

¹ ESIA and EIA may be used interchangeably. ESIA is the term used by the AfDB and EIA in Namibian legislation.

and enhance positive ones. The public participation process allows the findings of the assessment to be presented to stakeholders and ensures that comments are incorporated into the final report.

The objectives of an ESIA are as follows:

- Specialist investigation of all issues identified during the scoping phase and where sufficient information regarding these issues to predict potential impacts, are lacking;
- To ensure that environmental and social considerations are explicitly addressed and incorporated into the decision-making process;
- To anticipate and avoid, minimise or offset significant biophysical and social impacts of the project;
- To optimise positive impacts of the project;
- To ensure protection of the productivity and capacity of natural systems and the ecological processes which maintain their functions; and
- To promote development that is environmentally and socially responsible, assists in meeting sustainable development goals and optimises resource use and management opportunities.

The ESMP², which will be appended to the ESIA report, serves as a framework to manage environmental and social impacts identified in the ESIA throughout the project lifecycle.

The terms of reference for the ESIA are discussed in Chapter 9.

² ESMP and EMP may be used interchangeably. ESMP is the term used by the AfDB and EMP in Namibian legislation

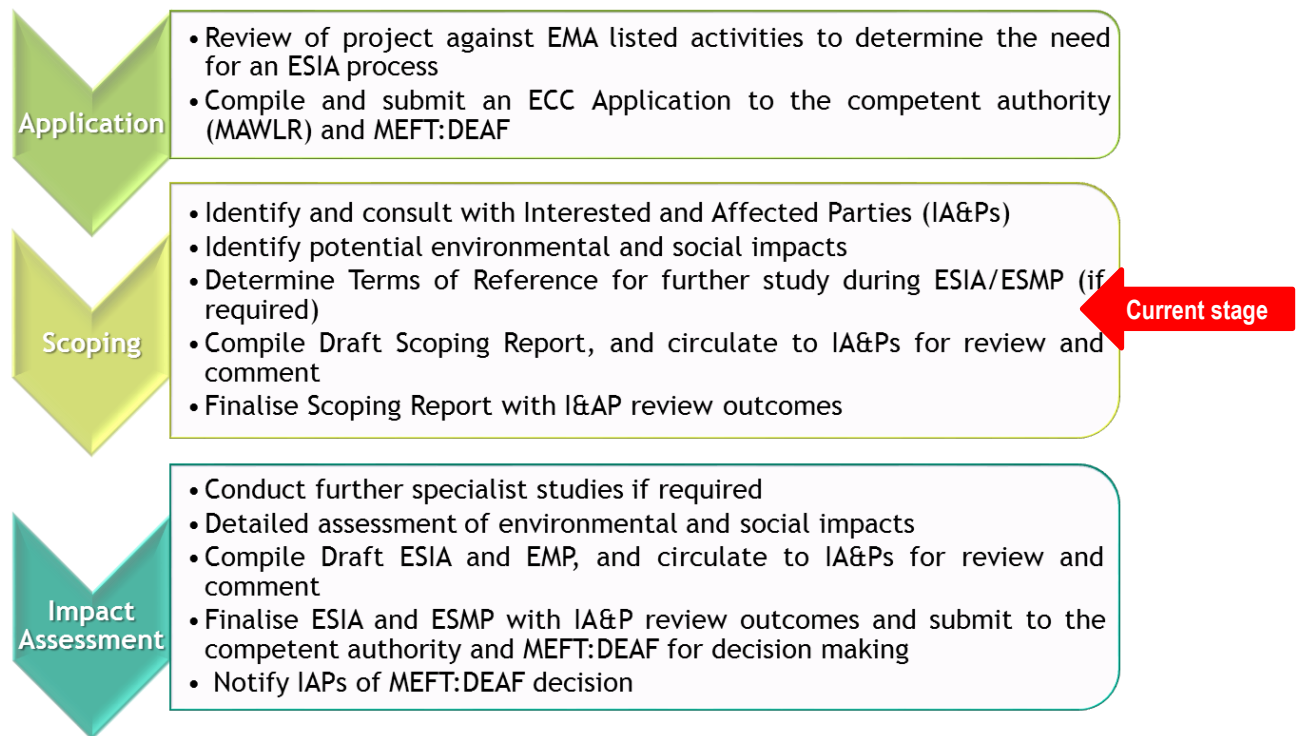


Figure 5-1: ESIA Process

5.4 Assumptions and Limitations

In compiling this SR, the following assumptions and limitations apply:

- It is assumed that the information provided by MAWLR is accurate, adequate and unbiased, and that no information that could change the outcome of the ESIA process has been withheld.
- This report is based on the most up to date information available to date.
- At the time of compiling this report, the project is still in conceptual design phase.
- No specialist studies have been completed to date. The specialist studies will be undertaken during the ESIA Phase.
- The scope of impacts presented in this report could change, should new information become available and once fieldwork is undertaken in the ESIA phase.

6 PUBLIC PARTICIPATION AND DISCLOSURE

6.1 Objective:

Public consultation forms an important component of an ESIA process. Public consultation provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. Public consultation has been done in accordance with both the EMA and its EIA Regulations. As prescribed from Regulation 21 to 24 of the EIA Regulations and AfDB's Operational Safeguards.

The public consultation process assists the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and to what extent further investigations are needed. Public consultation can also aid in the process of identifying possible mitigations measures.

6.2 Approach:

6.2.1 Interested and Affected Parties (I&APs)

GCS identified specific I&APs, who were considered interested in and/or affected by the proposed activities. The I&APs identified include; landowners, land occupiers, applicable organs of state (national, regional, and local) and other interested members of the public. These I&APs were contacted directly and registered as I&APs. In addition, notices regarding the project were placed in widely circulated national newspapers for two consecutive weeks inviting members of the public to register as I&APs. The detailed steps regarding the notification of I&APs are presented in **Section 6.2.2**. A summary of the I&APs identified are presented in **Table 6-1**. The complete list of I&APs is provided in **Appendix C**.

Table 6-1: Summary of Pre-Identified IAPs

List of IAPs	Description
	Ministry of Environment, Forestry and Tourism
	Ministry of Agriculture, Water and Land Reform
	Otjombinde Constituency Council
	Omaheke Regional Council
	Ovambanderu traditional authority
	NamWater
	National Heritage Council of Namibia (NHCN)
	National Botanical Research Institute (NBRI)

6.2.2 Communication with I&APs

Regulation 21 of the EIA Regulations details steps to be taken during a given public consultation process and these have been used in guiding this process.

Communication with I&APs about the proposed development was facilitated in English through the following means and in this order:

- Registration of the project with MEFT and MAWLR through submission of ECC application and copy of the BID dated 17 October 2023 (MEFT Application number APP-002322)
- A Background Information Document (BID) containing descriptive information about the proposed activities was compiled (**Appendix D**) and sent out to all identified and registered I&APs per email dated 24 August 2023;
- Notices were placed in *The Namibian and New Era* newspapers dated 24 and 31 August 2023, briefly explaining the activity and its locality, inviting members of the public to register as I&APs (**Appendix E**);
- Site notices were fixed at the relevant sites (Talismanus and Otjokoto Village sites) (**Appendix G**).
- A public meeting was held in Talismanus on 5 September 2023 and in Otjotoko Village on the 6 September 2023 (**Appendix H**).
- A meeting with the Authorities was held at the Otjombinde Regional Council on 5 September 2023 (**Appendix H**).

The report was made available to all I&APs for public review from **10 May 2024 until 24 May 2024**. I&APs had until **24 May 2024** to submit their comments on the project. The comments received during the comment period is presented in the Comments and Response Report (**Appendix I**).

7 ALTERNATIVES

Alternatives are defined as: “different means of meeting the general purpose and requirements of the activity” (Environmental Management Act (2007) of Namibia [and its regulations (2012)]). This chapter will highlight the different ways in which the project can be undertaken and to identify the alternatives that will be the most practical but least damaging to the environment and local communities.

Various alternatives have been identified in terms of the proposed development and its related activities. The most significant alternatives considered are:

- No-go option
- Site alternatives
 - Water Supply Schemes location

The above-mentioned alternatives considered for the proposed activity are discussed in the following subchapters.

7.1 No-Go Option

The “No-Go” alternative is the option of not proceeding with the activity, which typically implies a continuation of the status quo. Should the proposed Water Supply Schemes not commence none of the potential impacts (positive and negative) identified would occur. Otjombinde is one of the constituencies most affected by a lack of access to safe water, only 63.9 percent of the households in Otjombinde had access to safe water, while 26.6 percent relied on boreholes with an open tank and unprotected wells. Furthermore, given the fact that the capacity of the existing NamWater water supply schemes of Tallismanus- Reitfontein is not sufficient to meet the current demand of safe drinking water for the Otjombinde Constituency. The No-go action would not be an ideal alternative. Hence, adopting the no action alternative will mean that the existing shortfall in water supply will continue to prevail unabated and the future water security in Otjombinde Constituency will be compromised.

7.2 Site Alternatives

7.2.1 *Water Supply Schemes location*

Alternative locations for the proposed Water Supply Schemes were considered and investigated. A preferred site location for the Water Supply Schemes were determined based on the assessment of the status quo and a needs identification with the latter using information provided by the regional office of the DWSSC and the Omaheke Regional Council. The following aspects were considered for the site selection of the proposed new abstraction Water Supply Scheme:

- Water availability
- Population and livestock density

- Average household size
- Availability of bedrock to limit scouring.
- Access road to site.
- Access/Safety for the workers during construction.

8 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The proposed activities will be undertaken in an environment with specific conditions. Prior to any development in an area and as part of an environmental assessment process, it is vital to firstly understand the pre-project/development conditions. This is also important to form a baseline understanding of the area and make reasonable conclusions on certain issues that may arise years later during or after the project's operations. The environmental and social baseline for the project area is presented under the subchapters below.

8.1 Bio-physical Environment

8.1.1 Climate

The climate of Omaheke is classified as hot semi-arid climates (type "BSh") tend to be located in the 20s and 30s latitudes of the (tropics and subtropics), typically in proximity to regions with a tropical savanna or a humid subtropical climate. These climates tend to have hot, sometimes extremely hot summers and warm to cool winters, with some to minimal precipitation (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

Situated in eastern Namibia, summers in the region are often hot, with temperatures frequently exceeding 30 degrees Celsius. Summer nights are pleasant, with temperatures ranging from 12 to 18 degrees Celsius. Winter nights and early mornings, on the other hand, are typically frigid, with temperatures near or below freezing in southern places. Temperatures quickly climb to between 15 and 25 degrees Celsius, resulting in mild weather over the majority of the winter daylight hours (Mendelsohn, Jarvis, Roberts, & Robertson, 2021)

The highest rainfall months are July and August, with January and February being the wettest. The average annual precipitation varies greatly from year to year, ranging from 350 mm in the south and far west to 450 mm in the north. Many rainfalls are either too brief or too isolated to encourage plant development, and high evaporation rates result in significant water loss (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

Wind speeds are generally very low, and in most months, it is completely calm for over half the time.

8.1.2 Air Quality

The proposed project site is located in rural areas where the air quality is not affected by large scale anthropogenic activities. The major current atmospheric dust emissions in the area are primarily generated by vehicle dust and exhaust gas emissions, wind-blown dust from sparsely vegetated surfaces and veld fires.

8.1.3 Topography, Soils and Geology

The Omaheke region is dominated by the Kalahari grand soil and flat plain with a gentle slope downwards from west to east (Advanced Environmental Agency, 2022) . According to Mtuleni (2019), the Omaheke Region is located on the western margin of a huge sand basin, which affects most of the region's vegetation, animals, farming, and mineral possibilities. The sandy nature of the soils allows moisture to drain rapidly, mostly in a vertical direction, such that there is little to no surface runoff across much of the area. The soil generally retains few nutrients. Aquifers with higher yields can be found in a number of locations, including Grootfontein, Leonardville, Hochfeld, and the Eiseb (Namib-Enviro Consultants, 2023).

In the south of the Otjombinde Constituency, limestones and shales of the Witvlei Group are found, being part of the Damara Supergroup and Gariep Complex. Sediments in the Eiseb area are over 250m deep (Tulipamwe Consulting Engineers, 2022).

8.1.4 Hydrology and Hydrogeology

Surface water in Namibia is generally very limited and regarded as precious resources where they are available all year round.

The project area lies in the Eiseb -Epukiro River Basin. The area between Eiseb and Epukiro is one of eleven water basins in Namibia. In this area, there are no permanent rivers. After heavy rain, dry omuramba drainage channels may convey water for a short time.

Groundwater is known as the Okavango - Epukiro Basin located in huge flat areas around Gam. Most of the area belongs to the Okavango drainage system, including the dormant, usually dry riverbeds draining east towards the central Kalahari.

Groundwater within the area is hosted in two distinct aquifers and fractured bedrock aquifers. In northern Omaheke, the Kalahari is generally non-saturated, but ground water may be present in fractures in the underlying bedrock. Adjacent to the Botswana border, from Gam in the South to the Kaudom Park in the north, bedrock formations crop out and groundwater occurs in fractures aquifers (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

The Okavango-Epukiro groundwater region encompasses the Kavango Regions, the eastern part of the Otjozondjupa Region and the northern Omaheke Region as depicted in Figure 8-1.

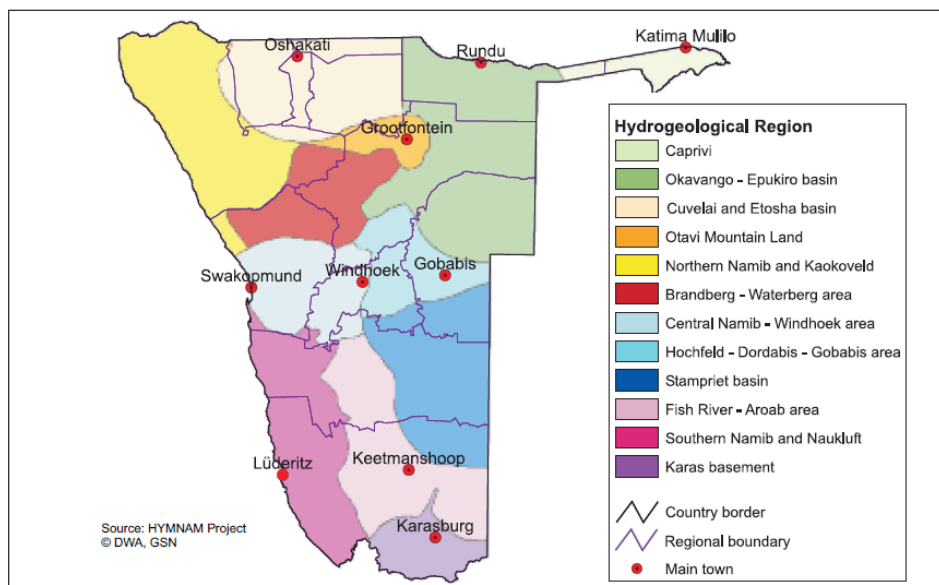


Figure 8-1: Groundwater basins and hydrogeological regions in Namibia (Ministry of Agriculture Water and Rural Development, 2011).

8.1.5 Fauna and Flora

A variety of small and larger animal species are found in the project area. Wild dog (*Lycaon pictus*) and the Elephant (*Loxodonta Africana*) are found on rare occasions. Other small antelope are found in the area and include the Duiker (*Sylvicapra grimmia*), Steenbok (*Raphicerus campestris*) and larger animals such as the Eland (*Taurotragus oryx*), the Gemsbok (*Oryx gazelle*), Kudu (*Tragelaphus strepsiceros*) and Warthog (*Phacochoerus africanus*) (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

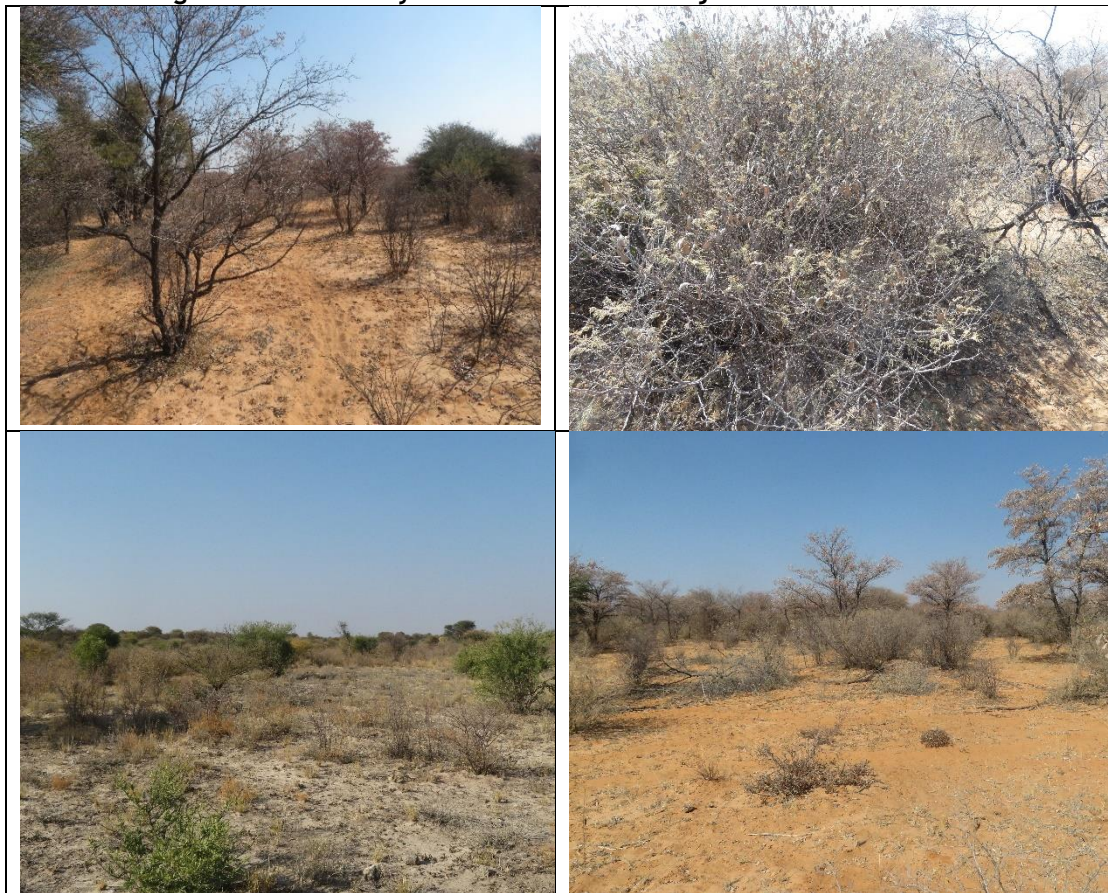
The largest part of the project is in the Kalahari Forest Savanna and Woodland vegetation classification. Taller trees are mainly confined to low sand ridges and are dominated by Silver Cluster Leaf (*Terminalia sericea*), Musheshe (*Burkea Africana*), Muparara (*Peltophorum africanum*), Lavender-croton (*Croton gratissimus*), Kalahari-currant (*Rhus tenuinervis*), Camelthorn (*Acacia giraffe / erioloba*), Sand-veld acacia (*A. fleckii*), Kalahari acacia (*A. luederitzii*), Large-fruited combretum (*Cobretum zeyheri*), Kudu-bush (*C. apiculatum*), and Buffalo-thorn (*Ziziphus mucronate*) (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

A shrub savanna occurs on the gently rolling plains between the sand ridges and is mainly composed of Sickie bush (*Dichrostachys cinereal*), Velvet raison bush (*Grewia flava*), Sandpaper raison bush (*G. flavescens*), Black-thorn (*Acacia mellifera*), White bauhinia (*Bauhinia macrantha*), Large sour-plum (*Ximenia caffra*), and Fire-thorn corkwood (*Commiphora pyracanthoides*) (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

The grass cover includes Silky bushman grass (*Stipagrostis uniplumis*), Coppery three-awn (*Aristida meridionalis*), Tassel three-awn (*A. congesta*), Broom love grass (*Eragrostis pallens*), Saw-tooth love grass (*E. superba*), Spear grass (*Heteropogon contortus*), Broad-leaved turpentine grass (*Cymbopogon excavates*), and Common finger grass (*Digitaria eriantha*) (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

Northeast Namibia, the tree savanna becomes dominated by Zambezi teak (*Baikiaea plurijuga*), with varying proportions of Mopane (*Colophospermum mopane*) and False ash (*Burkea africana*). With fire protection, a dense shrub layer develops and Jasmine pea (*Baphia massaiensis*), *Bauhinia petersiana*, and *Paropsia brazzeana* are all common. The grass layer is sparse when the shrubby understory is well developed, but when it is more open, species such as *Aristida meridionalis*, *A. congesta*, *Eragrostis pallens*, and Lehmann lovegrass (*E. lehmanniana*) are found. *Baikiaea plurijuga* (Caesalpinaceae) is fire sensitive and when fire damage is severe, it can disappear completely. *Baikiaea plurijuga* may have dominated a larger area of the ecoregion prior to the anthropogenic influences of fire, cultivation and woodcutting (Mendelsohn, Jarvis, Roberts, & Robertson, 2021).

Table 8-1: Vegetation commonly located within the subject area.



8.2 Socio-economic environment

The Omaheke Region is situated in the Eastern Namibia. It borders Botswana in the east, while within the country it borders the Hardap region to the south-west, Khomas region to the west and Otjozondjupa region to the north-west. Omaheke is known for cattle farming and the TransKalahari highway. The highway is Namibia's most important Central-Eastern gateway for travellers, and connects the country to Botswana, South Africa, and Zimbabwe for goods transportation.

The region has seven (7) constituencies, namely: Aminius, Gobabis, Kalahari, Otjinene, Otjombinde, Steinhausen and Epukiro.

8.2.1 Population

Otjombinde Constituency's population is estimated at 6 851 residents, with a population growth of 4.2 percent. The Otjombinde Constituency had a population density of 0.4 people per square kilometer in 2011. Regionally, females outnumber males at 109 males per 100 females (Namibia Statistics Agency, 2011).

Table 8-2 : : Otjombinde Constituency Population by age Source: (Namibia Statistics Agency, 2011)

Age	2001	2011
Under 5 years	15 %	17 %
5 - 14 years	29 %	25 %
15- 59 years	48 %	51 %
60 + years	6 %	6 %

As per Table 8-2 above, the larger proportion of the population are those within working age in the age bracket of 15-59 years of age (51%). Others between the ages 0 and 14 years of age, make up 42% of the population as of 2011 (Namibia Statistics Agency, 2011). The regional population shows a small percentage of those above the age of 60 (6%), which indicates a relatively low life expectancy for the area.

8.2.2 Education and Literacy Levels

According to the Namibia Statistics Agency, the literacy rate for Otjombinde Constituency amongst the population older than 15 years is 64.1% as of 2011, this is an increase of 3% since 2001. Although there has been an improvement in this regard, there is still a large need for basic education amongst the population (Namibia Statistics Agency, 2011).

Table 0-1: School attendance in Otjombinde Constituency Source: (Namibia Statistics Agency, 2011)

Attendance	2001	2011
Never attended school	42 %	37%

Currently attending school	15 %	10 %
Left School	41 %	48 %

Table 0-1 above, shows the statistics for school attendance according to the Namibian Statistics Agency. A large proportion of the population left school without completing (36.7%) or had no schooling at all (30.9%) thus there is a general lack of skills necessary to develop at the rate needed to improve socio economic conditions of the region. At 2011, 26.7% of the population was enrolled at school (Namibia Statistics Agency, 2011) .

There are 6 schools in the settlements of Otjombinde Constituency, 3 primary schools, 1 secondary school and 2 combined schools. All the schools are government schools (Martin *et al.*, 2018).

8.2.3 Health

Omaheke Region has 14 health facilities made up of 1 state hospital, 1 Health Centers and 12 clinics serving the region (Ministry of Health and Social Services, omaheke-region, n.d.).

High blood pressure, diabetes, joint inflammations, cardiac/heart diseases, arthritis, and rheumatism were considered to be common health problems for adults. Neck and back pains were reported to be common ailments among men, given that they were involved in heavy labour on farms and at shops. Stomachache and bacterial infections due to poor hygiene conditions were also mentioned as common ailments (Erik Dirkx and Maarit Thiem).

Among adults aged 15-64 years, prevalence of HIV varies geographically across Namibia, ranging with the lowest rate of 7.6% in the Kunene Region and the highest rate of and 22.3% in the Zambezi Region. Regions with higher than national prevalence tended to have higher HIV prevalence among females than males. The regions with the lowest prevalence were Kunene and Khomas. The Kavango East Region recorded an HIV prevalence of 14.5% in 2017 (NAMPHIA, 2018). According to the Ministry of Health and Social Services, there is a higher prevalence in rural than in urban areas, with more a feminization of the epidemic which in that is more pronounced in rural areas where the HIV prevalence among women is almost double that of men with the exception in of the regions of Omaheke and Kunene regions where the HIV prevalence is higher among men than women (Ministry of Health and Social Services, The Namibia Aids Response progress, 2015).

Malaria remains a public health concern in Namibia, and it is endemic in many regions, including Kavango east region. Surprisingly for an arid region such as Omaheke, where malaria is not endemic, this illness was perceived as one that occurred commonly at Corridor 13, Blouberg and Goreseb (Erik Dirkx and Maarit Thiem).

8.2.4 Income and livelihood

The Omaheke region is the ninth poorest region in Namibia in term of the Human Development Index (HDI). The HDI concentrates in the three essential factors of human life; longevity, knowledge, and a decent standard of living. The HDI of the region is 0.5, but the Otjombinde Constituency is geographically located at a strategic crossroad and has, since peace and stability returned to Botswana, developed into a significant border Constituency.

The labour force size for Otjombinde Constituency is estimated at 1 939, representing a Labour Force Participation Rate (LFPR) of 49.1 percent. Lower LFPR indicates high dependence rate (Namibia Statistics Agency, 2011). In the case of Otjombinde Constituency, low LFPR can be viewed as an opportunity since the dependent population or economically inactive are mainly composed of young school going population who are likely to benefit the local economy with better skills in future (Martin *et al.*, 2018).

In 2011, the employment rate in the Omaheke Region for the labour force (65.2% of those 15+) was 60.5% employed and 39.5% unemployed. For those 15+ year old not in the labour force (23.6%), 34.3% were students, 27.6% home-makers and 4.9% retired. A total of 64 percent of the labour force in Otjombinde Constituency are employed (Martin *et al.*, 2018). Otjombinde Constituency is estimated to have an unemployment rate of 36% which is above the 34% national unemployment rate of 2011 (Namibia Statistics Agency, 2011).

Agricultural activities are common in the Omaheke region with mostly livestock farming taking place. Besides livestock farming, there are a few homesteads involved in other agricultural practices like growing cabbages, butter nuts etc. The most common livestock in Omaheke region includes cattle and goats with some farmers also owning sheep (Martin *et al.*, 2018).

Table 0-2: Primary source of Income Otjombinde Constituency **Source:** (Namibia Statistics Agency, 2011)

Main Source of Income	2001	2011
Farming	53 %	53 %
Salaries/wages	21 %	26 %
Remittances	9 %	1 %
Business	5 %	6 %
Pension	9 %	10 %

As indicated in **Table 0-2** above, in terms of household's main sources of income in the Otjombinde Constituency in 2011, 53% derived income from farming, 26% from wages and salaries, 1% cash remittances, 6% from business or non-farming activities, and 10% from pensions.

8.2.5 Administration and Governance

Urban areas fall under the direct jurisdiction of the applicable Local Authority and are governed by the Local Authorities Act. On the other hand - settlement areas fall under the jurisdiction of the Regional Council in terms of the Regional Councils Act. The Omaheke Region has seven constituencies namely Aminius, Gobabis, Kalahari, Otjinene, Otjombinde, Steinhausen and Epukiro. (Ministry of Lands and Resettlement, 2015).

Gobabis is currently the only proclaimed town within the region while Otjinene and Epukiro are declared settlements, which means that these settlements will most likely receive Village status in the future. Otjombinde constituency has one declared settlement in Talismanus located in the east close to the Botswana border. Eiseb 10; Helena and Okatumba Gate has all been identified by the then Ministry of Regional, Local Government and Housing and Rural Development (MRLGHRD) as identified settlements/ growth points, which proven feasible, might be upgraded to settlement status in the future.

8.2.6 Land use and ownership

Land tenure in Namibia is based on three main categories of land ownership: private ownership (freehold land), central government (communal areas, resettlement farms and protected parks) and local authorities (urban land) (Ministry of Lands and Resettlement, 2015).

All land in the Otjombinde Constituency is communally owned, with land in the southern third of the areas surveyed, and that in the northern two thirds not. A resettlement farm is located east of the Donkerbos, whilst small areas show individual, or group registered communal land titles and the San Community Project is demarcated to the northeast of Otjikoto (Tulipamwe Consulting Engineers, 2022).

Communal land refers to land being available for communal grazing and cropping areas that is still under jurisdiction of the Traditional Authority and the communal land board with no other land uses occupying the land (Ministry of Lands and Resettlement, 2015).

Most of the Otjombinde Constituency is covered by (from north to south) the Ondjou, Eiseb, Omuramba Ua Mbinda and Otjombinde Communal Conservancies.

8.2.7 Archaeology

In Namibia, heritage resources are protected under the National Heritage Act (No 27 of 2004). No archaeological or anthropological assessment was done. It is predicted that no archaeological or anthropological resources will be found in the project area. Where new schemes are to be constructed it is important to note that any archaeological or anthropological resources found should be reported to the Engineer for further action.

The subject sites are not expected to be rich in archaeological finds.

8.2.8 Infrastructure and Services

8.2.8.1 Water Supply

In the Omaheke Region, 85.1 percent of households had access to safe water. Furthermore, about 96 percent of the households in urban areas had access to safe water, compared to 79.8 percent of those in rural areas. With regards to unsafe water, 18.9 percent of households in rural areas rely on boreholes with an open tank, and unprotected wells as their main source of water for cooking/drinking (Namibia Statistics Agency, 2011).

At constituency level, it is observed that only 63.9 percent of the households in Otjombinde had access to safe water, while 26.6 percent relied on boreholes with an open tank and unprotected wells. In 2015 already, the Omaheke Regional Council noted that Otjombinde is one of the constituencies most affected by a lack of access to safe water, along with those of Otjinene and Epukiro, whilst “water shortage in some areas” is noted first on the list of challenges experienced by the Otjombinde Constituency (Tulipamwe Consulting Engineers, 2022).

The relatively low access to safe water in rural areas nationally, and specifically in the Otjombinde Constituency, are the main reason or motivation for the Otjombinde Rural Water Supply Project, which is specifically aimed at improving the access to safe, potable water in the Project Area to benefit marginalised communities.

8.2.8.2 Electricity

Electricity supply in the Omaheke region is managed by the Central North Regional Electricity Distributor Company (CENORED). Electricity costs in the region are subject to the tariffs charged by CENORED in distributing electricity to the region. About 73 percent of households in Omaheke region rely on wood as the main source of energy for cooking, while about 17.9 percent use electricity from the main grid. With respect to the sources of energy for lighting, the most common energy source in the region was candlelight, at 34.5 percent, followed by electricity from the main grid (33.4%). Otjombinde and Otjinene made up the largest proportions of households using paraffin, at 62.3 and 51.2 percent respectively (Namibia Statistics Agency, 2011).

8.2.8.3 Information and Communication

Access to information is made effective with the population having access to communication Devices. In Omaheke region, radio and mobile phone remains the most common forms of communication assets owned by households. Approximately 67% and 45% of households in Omaheke region own radio and mobile phones respectively (Namibia Statistics Agency, 2011).

However, access to other modern information and communication technology such as computers and internet is fairly limited, particularly in rural areas.

9 PRELIMINARY IMPACT IDENTIFICATION

The potential impacts that could arise as a result of the proposed project have been identified based on existing sources of information and knowledge of the affected environment. Impacts specifically relating to social aspects and ecology will be interrogated and analysed in further detail at the ESIA stage. The preliminary list of potential impacts has been used to guide the type of specialist studies required in the ESIA. These preliminary impacts are discussed in Table 9-4 to Table 9-25. Mitigation measures have been outlined, however detailed mitigation measures for each impact identified will be outlined in the ESMP.

9.1 Proposed Assessment Methodology

In assessing the impact of the proposed development, rating scales should be considered. Each issue identified should be evaluated in terms of the most important parameter applicable to environmental management. These include the extent, intensity, probability, and significance of the possible impact on the environment and whether such effects are positive (beneficial) or negative (detrimental). The rating scales to be used are as follows:

Table 9-1: Impact Assessment Rating Scales

CRITERIA	DESCRIPTION			
EXTENT	National (4) The whole country	Regional (3) Omaheke region and neighbouring regions	Local (2) Within a radius of 2 km of the development site.	Site (1) Within the development site
DURATION	Permanent (4) Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	Long-term (3) The impact will continue/last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter.	Medium-term (2) The impact will last for the period of the project phase, where after it will be entirely negated	Short-term (1) The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
INTENSITY	Very High (4) Natural, cultural, and social functions and processes are altered to extent that they permanently cease	High (3) Natural, cultural, and social functions and processes are altered to extent that they temporarily cease	Moderate (2) Affected environment is altered, but natural, cultural, and social functions and processes continue albeit in a modified way	Low (1) Impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected
PROBABILITY	Definite (4) Impact will certainly occur	Highly Probable (3) Most likely that the impact will occur	Possible (2) The impact may occur	Improbable (1) Likelihood of the impact materialising is very low

CRITERIA	DESCRIPTION
SIGNIFICANCE	Is determined through a synthesis of impact characteristics. Significance is also an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Table 9-2: Description of the significance of impacts

Low impact	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction, or operating procedure
Medium impact	Mitigation is possible with additional design and construction inputs.
High impact	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse
It is important to note that the status of an impact is assigned based on the status quo. Therefore, not all negative impacts are equally significant.	
Significance Rating Scale Points 1-4 Insignificant/low Points 5-8 Significant /Moderate Points 9-12 Very significant/High. Points 13-16 Highly significant /Very high	

The significance of each impact will be rated before and after mitigations measures.

9.2 Anticipated Impacts: Planning and Design Phase

The first step in avoiding and preventing any possible negative impacts associated with any project, should start with the planning and designing phase. Issues to be considered at the planning and design phase of the proposed development are as follows.

9.2.1 Siting of scheme infrastructures

The siting of schemes infrastructure needs to be carefully considered as some areas such as the area proposed for the new schemes are vegetated and would need to be cleared.

Vegetation should be cleared only where absolutely necessary and if cleared, numbers of protected, endemic and near endemic species removed should be documented. The trees to be protected need to be identified and marked by a specialist in consultation with the contractor. Trees and plants protected under the Forest Act No 12 of 2001 are not to be removed without a valid permit from the local Department of Forestry.

9.2.2 Electricity/power availability/sufficiency

The electricity requirement under the schemes will increase at the four main locations.

The total estimated power requirement for the schemes is indicated in **Table 9-3** below.

Table 9-3: summary of scope of work for the proposed new schemes

Scheme / Cost Component	Unit	Details per Scheme		
		Eiseb West Scheme	Eiseb South Scheme	Okarupuri Scheme
Drilling & test pumping of boreholes (estimated - provision made for 1 additional borehole in case of unsuccessful siting and drilling)		2 x 200 m depth (each)	3 x 200 m depth (each)	3 x 200 m depth (each)
Submersible solar-driven borehole pumps (estimated)		20 m ³ /h @ 200 mwh	7.56 m ³ /h @ 185 mwh	13.4 m ³ /h @ 170 mwh
Pipelines: Boreholes to GLR	m	2,742	8,492	2,742
Water demand (AADD)	m ³ /d	163.50	89.9	159.5
Pressed steel ground level reservoir	m ³	201	107	201
Booster pump station (Peak Pumping Rate over 7 hrs per day)		34.1 m ³ /h @ 1,500 kPa	22.6 m ³ /h @ 1,500 kPa	38 m ³ /h @ 900 kPa
Pipelines: Total length	m	32,484	14,972	21,242
Pipelines: Details (diameter and pressure class – min / max)		50 mm Cl 10 – 200 mm Cl 16	50 mm Cl 10 – 110 mm Cl 6	50 mm Cl 10 – 200 mm Cl 9
Water meter manifolds	No.	23	11	23
Elevated reservoirs at 6 m height	No.	8	5	6

/;

9.2.3 Traffic flow

Traffic is expected to increase once construction commences on site. Due to the pipeline routes being sited within existing road reserves of the Otjombinde Constituency villages there will be an impact on traffic flow in the area during construction. Mitigation measures set out in the EMP need to be followed to ensure that traffic impacts remain minimal. Wayleaves would need to be applied for by MAWLR for the pipelines from the Omaheke Regional Council.

9.2.4 Land use

The proponent should consult with the landowners and/or traditional authorities or relevant land users to obtain a written land use/leasehold agreement prior to constructing infrastructure. All relevant land permits and leaseholds documents should be obtained from the landowners or authorities.

9.2.5 Climate Change

Namibia is one of the countries which are believed to be hit hardest in terms of climate change induced drought, the country has witnessed devastating effects of climate change on the socio-economic folds of communities. The project must thus ensure that it does not exacerbate the risks of climate change but rather mitigate them. The uncontrolled or unregulated abstraction of water is an example of a potential risk to climate change. The project must thus ensure that adaptation measures are put in place in order to increase the resilience of the infrastructure to be built or rehabilitated to withstand the impacts of climate change.

9.3 Anticipated Impacts: Construction Phase

The construction phase is mostly concerned with the impacts on the biophysical and socio-economic environment that is likely to occur during the construction phase of the development. These potential impacts are likely to be temporary in duration but may have longer lasting effects. There will be positive impacts such as temporary job creation and skills development.

9.3.1 Impact Assessment of Biodiversity Disturbance and Loss

The preparation of the site for the proposed development involves clearing of the site areas. This may impact the existing biodiversity on these proposed sites. Both sites accommodate large trees and possibly some fauna. During site preparation it should be ensured that only the areas applicable to the project site area are cleared. The trees to be protected need to be identified and marked by a specialist in consultation with the contractor. The layout of the proposed Schemes should incorporate existing protected trees which may not be removed without a valid permit from the local department of Forestry. The impact is not expected to be of such a magnitude and/ or significance that it will have irreversible impacts on the biodiversity and endemism of the area and Namibia at large. The assessment of this impact is presented in **Table 9-4**.

Table 9-4: Assessment of the impacts of the proposed activities on biodiversity disturbance and loss

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	3	3	3	10
Post-mitigation		1	3	2	3	9

9.3.1.1 Mitigations and recommendation to biodiversity disturbance and loss

- Vegetation should be cleared only where absolutely necessary and if cleared, numbers of protected, endemic and near endemic species removed should be documented and submitted to the local Department of Forestry.
- All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is essential.
- Trees and plants protected under the Forest Act No 12 of 2001 are not to be removed without a valid permit from the local Department of Forestry.
- The local Department of Forestry should be consulted with regards to the proper disposal of cleared trees.
- Suitable locations for the contractors lay-down areas and materials camp should be identified and the following should be considered in selecting these sites:
 - Previously disturbed areas should be used as far possible.
 - Second option should be degraded land.
 - Avoid sensitive areas (e.g. rivers/drainage lines).

9.3.2 Impact Assessment of potential pollution to Surface and Groundwater

Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to surface and groundwater contamination, in case of spills and leakages. Leakages from vehicles and machines during construction may also contribute to surface and groundwater contamination. Furthermore, the following activities which may take place during construction will likely contribute to groundwater impacts:

- Site preparation, including placement of contractor laydown areas and storage (i.e., temporary stockpiles, banded areas etc.) facilities.
- In-situ placement of new soils, altering existing soil-flow processes (i.e., infilling of wetlands or cut-and-fill areas).
- Soil compaction.
- Soil & surface water contamination and sedimentation from the following activities:
 - Leakages from vehicles and machines, and seepage from building materials/stockpiles.

- Erosion and sedimentation if excavations are left open due to unforeseen circumstances (i.e., bad weather, heat, construction downtime).

The assessment of this impact is presented in **Table 9-5**.

Table 9-5: Assessment of the impacts of the proposed activities on surface and groundwater

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	2	2	2	3	9
Post-mitigation		1	2	1	2	6

9.3.2.1 Mitigations and recommendation to surface and groundwater

- Careful storage and handling of hydrocarbons on site is essential.
- Workers responsible for the storage and handling of hydrocarbons should be suitably trained to do so and trained on spill prevention (e.g., the use of drip trays) and the handling of potential spills should they occur to be able to ensure implementation on site.
- Potential contaminants such as wastewater should be contained on site and disposed of so that they do not contaminate surrounding soils and eventually groundwater.
- Contaminants such as hydrocarbons should be stored, handled, and managed appropriately. These must be collected on site and disposed at an appropriate facility that is licenced to receive such waste.
- Only excavate areas applicable to the project area.
- Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils.
- Cover excavated soils with a temporary liner to prevent contamination.
- Keep the site clean of all general and domestic wastes.
- Exposed soils to be protected using a suitable covering or revegetating.
- Existing roads should be used as far as practical to gain access to the site.
- Have emergency fuel & oil spill kits on site.
- Visual soil assessment for signs of contamination at vehicle holding, parking and activity areas.
- Place oil drip trays under parked construction vehicles.

- Above ground fuel tanks should be located on an impermeable surface that is bunded - with a volume of 120% of the total volume stored.

9.3.3 Impact Assessment of Soil Erosion Impacts

Soil erosion is likely to occur on site given the characteristics of the site. The assessment of this impact is presented in Table 9-6.

Table 9-6: Assessment of the impacts of the proposed activities on soil erosion

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	2	2	7
Post-mitigation		1	1	1	1	4

9.3.3.1 Mitigations and recommendation to soil erosion

- Erosion control measures as outlined in the ESMP should be implemented to ensure that the topsoil is not washed away.
- Checks must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial actions as outlined in the ESMP are to be undertaken wherever erosion is evident.

9.3.4 Impact Assessment of Archaeological and Heritage Impacts

The proposed activity is not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the construction activities, mitigation measures need to be in place to ensure that these resources are not harmed. The assessment of this impact is presented in Table 9-7.

Table 9-7: Assessment of the impacts of the proposed activities on Archaeological and Heritage Impacts

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	2	1	6
Post-mitigation		1	1	1	1	4

9.3.4.1 Mitigations and recommendation to Archaeological and Heritage Impacts

- All works are to be immediately ceased in an affected area should an archaeological or heritage resource be discovered.
- The National Heritage Council of Namibia (NHCN) should advise with regards to the removal, packaging, and transfer of the potential resource.

- Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a “chance find” procedure should be applied as outlined in the ESMP.

9.3.5 Impact Assessment of Health and Safety

Construction activities may cause health and safety risks to people operating on the site. These may include safety risks as a result of construction works as well as the potential spread of HIV/AIDS from contractors during construction. Furthermore, it may result in potential public safety concerns associated with the excavation works for the installation of the water supply network. The assessment of this impact is presented in **Table 9-8**.

Table 9-8: Assessment of the impacts of the proposed activities on health and safety

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	2	2	7
Post-mitigation		1	1	1	1	4

9.3.5.1 Mitigations and recommendation to health and safety

- Construction workers should be provided with awareness training about the risks associated with the proposed construction work such as hydrocarbon handling and storage, the handling of heavy machinery etc.
- During the works conducted, workers should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, safety glasses etc.
- The contractors should comply with the provisions with regards to health and safety as outlined in the Labour Act (No. 6 of 1992).
- Construction sites should be demarcated and fenced, and public access should not be allowed to the construction sites to prevent injury or accident due to entry onto a construction site.

9.3.6 Impact Assessment of Noise Generation Impacts

Construction activities and the presence of construction vehicles may lead to the generation of noise which could impact the local surrounding residents negatively, if not properly handled. This may pose a disturbance on the surrounding residents. The assessment of this impact is presented in **Table 9-9**.

Table 9-9: Assessment of the impacts of the proposed activities on noise generation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	2	3	8

Post-mitigation		1	2	1	2	6
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9.3.6.1 Mitigations and recommendation to noise generation

- Construction activities should be limited to daytime hours (between 07h00 and 17h00) unless otherwise arranged with community members in the area.
- No amplified music should be allowed on site.
- Technology such as silencers should be installed on construction machinery, as needed.
- The use of horns as a general communication tool should not be allowed, they should only be used, when necessary, as a safety measure.

9.3.7 Impact Assessment of Dust Generation Impacts

Construction activities and the presence of construction vehicles may lead to the generation of dust which could impact the local residents negatively, if not properly handled. The assessment of this impact is presented in **Table 9-10**.

Table 9-10: Assessment of the impacts of the proposed activities on dust generation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	2	3	8
Post-mitigation		1	2	1	2	6

9.3.7.1 Mitigations and recommendation to dust generation

- Dust abatement techniques should be implemented e.g., spraying of water on site to reduce dust levels to an acceptable standard.
- The local community should be continuously consulted to ensure that the dust levels are acceptable.
- Residents should be informed prior to construction commencing so that they are aware of the planned construction.
- During high wind conditions the contractor must make the decision to cease works until the wind has settled.
- Stockpiles and sand being transported should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.
- Ensure that drivers adhere to speed limits and that speed limits are strictly enforced particularly for driving on gravel roads (suggested 30 km/h).

9.3.8 Impact Assessment of Waste Generation (Domestic/General and Hazardous) Impacts

Construction activities usually generate wastes which leads to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into water pipelines; animals may choke on waste when ingested and additionally it may pose a negative visual impact on the surrounding environment. The assessment of this impact is presented in Table 9-11.

Table 9-11: Assessment of the impacts of the proposed activities on waste generation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	2	3	8
Post-mitigation		1	2	1	2	6

9.3.8.1 Mitigations and recommendation to waste generation

- The construction site should be kept tidy at all times.
- All domestic and general construction waste produced on a daily basis should be cleared and contained.
- No waste may be buried or burned on site or anywhere else.
- Waste containers (bins) should be emptied during and after the construction and the waste removed from site to the municipal waste disposal site.
- Separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.
- Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter.
- No waste may remain on site after the completion of the project.
- The recycling of waste should be considered and implemented as far as possible.
- Hazardous waste:
 - All heavy construction vehicles and equipment on site should be provided with a drip tray.
 - All heavy construction vehicles should be maintained regularly to prevent oil leakages.
 - Maintenance and washing of construction vehicles should take place only at a designated workshop area.

- Hazardous waste, including emptied chemical containers should be safely stored on sites where they cannot be reached and used by the unsuspecting and uniformed locals for personal use. No waste should be improperly disposed of on sites or its surroundings, i.e., unapproved waste sites
- A comprehensive list of all potentially hazardous wastes and estimated volumes shall be compiled for all activities. A hazardous materials inventory shall be kept and be readily available for inspection by implementing agencies and relevant authorities.
- Specifications for storing and handling of all hazardous waste and substances (e.g., fuel and chemicals) shall be adhered to. Specific attention shall be paid to designing the fuel storage sites and control during filling to manage pollution risks.
- All hazardous waste that cannot be handled safely shall be temporarily stored before being removed to a hazardous waste disposal site by authorised service providers.
- Material Safety Data Sheets shall be used in all cases in assisting in assessing the possible risk and best approach to handling and disposal methods. These shall be available at locations/sites where chemicals are stored and used.
- Hazardous waste is to be disposed at a Hazardous Waste Facility which is licenced to receive such waste.

9.3.9 Impact Assessment of Temporary Employment Creation

The proposed activity may provide employment opportunities for the local people during construction. The assessment of this impact is presented in Table 9-12.

Table 9-12: Assessment of the impacts of the proposed activities on temporary employment creation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Positive	2	2	1	2	7
Post-mitigation		2	2	1	2	7

9.3.9.1 Mitigations and recommendation to temporary employment creation

- Should any job opportunities result, they should be made available to the local people in the area as far as reasonably possible.

9.3.10 Impact Assessment of Disturbance of local residents

Construction activities will result in disturbance to local residents within the areas in which construction will be taking place. The assessment of this impact is presented in **Table 9-13**.

Table 9-13: Assessment of the impacts of the proposed activities on disturbance of local residents

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	2	2	2	3	9
Post-mitigation		1	2	1	2	6

9.3.10.1 Mitigations and recommendation to disturbance of local residents

- Surrounding residents are to be informed in advance of the intended construction commencement dates.
- Construction should only take place during working hours (07h00 to 17h00).
- Should construction need to take place outside of working hours residents are to be informed in writing (via hand delivered letters to the immediate neighbours) 1 week in advance.

9.4 Anticipated Impacts: Operational Phase

The potential impacts associated with the operational phase of the activities have been identified and assessed in this subchapter. The main impacts identified are; surface and groundwater, noise, waste, health and safety and hazardous substance handling and storage.

9.4.1 Impact Assessment of Soil, Surface and Groundwater

Surface and groundwater impacts may be encountered during the operational phase, especially if development takes place within the rainy season. The operational activities on site should be conducted in a manner to avoid the contamination of surface and groundwater. The assessment of this impact is presented in **Table 9-14**.

Table 9-14: Assessment of the impacts of the activities on soil, surface, and groundwater

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	2	2	2	3	9
Post-mitigation		1	1	1	1	4

9.4.1.1 Mitigations and recommendation to soil, surface, and groundwater

- Ensure that surface water accumulating on-site are channelled and captured through a proper storm water management system.

- Monitoring of stormwater systems to ensure that the system operates as per design specifications.
- Routine visual inspections of sewer infrastructure and parking areas for signs of soil contamination.
- All hazardous substances shall be appropriately stored and secured within well ventilated and covered areas.
- Appropriate bunding whereby the bund can accommodate 110% of the content of the stored materials will also be provided where required.
- Bunding, concrete slabs and/or other protective measures should be installed where hazardous materials are handled.
- Ensure that the staff are informed and have information pertaining to the management of spills or ingestion.

9.4.2 Impact Assessment of Noise

The operational activities may result in associated noise production. The assessment of this impact is presented in Table 9-15.

Table 9-15: Assessment of the impacts of the activities on noise

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.4.2.1 Mitigations and recommendation to noise

- Noise levels during operational activities should be kept within the allowable standards for rural areas.
- Noise levels should adhere to the SANS restrictions on noise.
- Work hours should be restricted to between 07h00 and 17h00 where the use of heavy equipment, power tools and the movement of heavy vehicles is required.
- Noisy equipment should be shut down when not in use (when not needed) to avoid unnecessary noise on site.
- Workers performing noisy tasks should be rotated regularly (work on shifts) to avoid exposing them to excessive noise for a long period of time in a day.
- Workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.

- Workers should ensure that they wear the necessary PPE at all times on work sites

9.4.3 Impact Assessment of Waste

wastes will be produced from the site. These wastes will include general/domestic waste. This should be disposed of in an appropriate manner to reduce the risk of pollution on site. The assessment of this impact is presented in Table 9-16.

Table 9-16: Assessment of the impacts of the activities on waste

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.4.3.1 Mitigations and recommendation to waste

- The solid sludge produced should be disposed at a registered waste landfill site.
- All domestic and hazardous waste will be removed to an appropriate waste site that is suitable to receive such waste.
- No waste should be buried or burned.
- General Waste: Includes waste paper, plastic, cardboard, harmless organic (e.g. vegetables) and domestic waste.
- No littering will be allowed. The scheme area will be kept free of waste at all times.
- Provide sufficient waste bins at worksites. Make sure that all waste is removed from the worksites.
- Hazardous Substances include: sewerage, fuels, lubrication oils, hydraulic and brake fluid, solvents, paints, anti-corrosives, insecticides and pesticides, chemicals, acids etc. It should be disposed of at designated hazardous disposal sites.
- Contaminated soil should be stored in drums and taken to the nearest appropriate waste dumpsite.
- Do not change oil on uncovered ground. Drip trays will be used to catch oil when vehicles are repaired in the field.
- In the event of a hazardous spill:
 - Immediately implement actions to stop or reduce the spill.
 - Contain the spill.

- Arrange implementation of the necessary clean-up procedures.
- Collect contaminated soil, water and other materials and dispose it at an appropriate waste dumpsite.
- Used solvents and grease should be stored in drums or other suitable containers. It should be sealed and recycled or disposed at an appropriate disposal site.
- Hazardous waste should not be burnt.

9.4.4 Impact Assessment of Health and Safety

Operational activities may cause health and safety risks to people operating on the site. The assessment of this impact is presented in Table 9-17.

Table 9-17: Assessment of the impacts of the proposed activities on health and safety

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.4.4.1 Mitigations and recommendation to health and safety

- Operators at the site should be provided with awareness training about the risks associated with the associated operational activities.
- During the works conducted, workers should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, safety glasses etc.
- All open water structures that are on ground level should be fitted with handrails to prevent the possibility of operators falling into these structures.
- Chlorination equipment must be contained in the appropriate way in a separate building away from other chemicals.
- Chlorine gas should be stored in accordance with the Materials Safety Data Sheet (MSDS) for example storage within a well-ventilated area
- All relevant safety signage and equipment must be available on site.

9.4.5 Impact Assessment of Hazardous Substance Handling and Storage

Hazardous substances to be used on site such as Potassium Permanganate (granule), Polyelectrolyte (granule), Soda Ash (granule), Chlorine (gas), Ammonium Sulphate (granule) must be used and stored in accordance with the relevant health and safety standards. The assessment of this impact is presented in Table 9-18.

Table 9-18: Assessment of the impacts of the proposed activities on Hazardous Substance Handling and Storage

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	3	2	2	8
Post-mitigation		1	2	1	1	4

9.4.5.1 Mitigations and recommendation to Hazardous Substance Handling and Storage

- Emergency preparedness plans, safety equipment and emergency clean up procedures must be in place in case of a spillage.
- All hazardous substances shall be appropriately stored and secured within well ventilated and covered areas. Appropriate bunding whereby the bund can accommodate 110% of the content of the stored materials will also be provided where required.
- Hazardous waste, including emptied chemical containers (e.g., liquid chlorine, sodium hypochlorite) and other chemicals used for disinfection in the operational phase should be safely stored on site where they cannot be reached and used by the unsuspecting and uninformed locals for personal use.
- No waste should be improperly disposed of on site or its surroundings, i.e., unapproved waste sites.
- A full list of all hazardous fuels and chemicals stored on site should be kept by the site supervisor, including accompanying volumes, locations and Material Safety Data Sheets (MSDSs).
- All hazardous substances should be stored and handled in accordance with the MSDSs.

9.4.6 Impact Assessment of Increased energy usage

The new infrastructure to be constructed will have an increased energy demand. The assessment of this impact is presented in Table 9-19.

Table 9-19: Assessment of the impacts of the proposed activities on increased energy usage

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	

Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.4.6.1 Mitigations and recommendation to increased energy usage

- The proponent is to investigate the feasibility of use of alternative forms of energy such as solar power.

9.4.7 Impact Assessment increased water supply to the surrounding villages

The proposed development will result in an increase of water supply to the surrounding villages. This may result in a number of benefits including improved health, time availability for other chores instead of fetching water. Reduced incidences of human-crocodile conflict or interaction as the residents do not need to fetch water from the river. The assessment of this impact is presented in Table 9-20.

Table 9-20: Assessment of the impacts of the proposed activities on increased water supply to the town and surrounding villages

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Positive	2	3	1	2	8
Post-mitigation		2	3	1	2	8

9.4.7.1 Mitigations and recommendation on increased water supply to the surrounding villages

- No mitigation measures proposed.

9.5 Anticipated Impacts: Decommissioning Phase

The decommissioning impacts are assessed for the proposed infrastructure that will be decommissioned as part of the project as well as in the case where the newly constructed facilities become decommissioned in future. The impacts identified are outlined below.

9.5.1 Impact Assessment of Noise Generation Impacts

Decommissioning activities and the presence of vehicles and machinery may lead to the generation of noise which could impact the local surrounding residents negatively, if not properly handled. This may pose a disturbance on the surrounding residents. The assessment of this impact is presented in Table 9-21.

Table 9-21: Assessment of the impacts of the proposed activities on noise generation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.5.1.1 Mitigations and recommendation to noise generation

- Decommissioning activities should be limited to daytime hours (between 07h00 and 17h00) unless otherwise arranged with community members and businesses in the area.
- No amplified music should be allowed on site.
- Technology such as silencers should be installed on construction machinery.
- The use of horns as a general communication tool should not be allowed, they should only be used, when necessary, as a safety measure.

9.5.2 Impact Assessment of Dust Generation Impacts

Decommissioning activities and the presence of vehicles may lead to the generation of dust which could impact the local residents negatively, if not properly handled. The assessment of this impact is presented in **Table 9-22**.

Table 9-22: Assessment of the impacts of the proposed activities on dust generation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.5.2.1 Mitigations and recommendation to dust generation

- Dust abatement techniques should be implemented e.g., spraying of water on site to reduce dust levels to an acceptable standard.
- The local community should be continuously consulted to ensure that the dust levels are acceptable.
- Residents should be informed prior to decommissioning commencing so that they are aware of the planned construction.
- During high wind conditions the contractor must make the decision to cease works until the wind has settled.
- Stockpiles and sand being transported should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.

9.5.3 Impact Assessment of Waste Generation Impacts

Decommissioning activities may generate wastes which leads to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into water pipelines; animals may choke on waste when ingested and additionally it may pose a negative visual impact on the surrounding environment. The assessment of this impact is presented in Table 9-23.

Table 9-23: Assessment of the impacts of the proposed activities on waste generation

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.5.3.1 Mitigations and recommendation to waste generation

- The site should be kept tidy at all times.
- All domestic and general waste produced on a daily basis should be cleared and contained.
- No waste may be buried or burned on site or anywhere else.
- Waste containers (bins) should be emptied during and after the construction and the waste removed from site to the municipal waste disposal site.
- Separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.
- Labourers should be sensitised to dispose of waste in a responsible manner and not to litter.
- No waste may remain on site after the completion of the project.
- The recycling of waste should be considered and implemented as far as possible.
- Different types of waste i.e. general, hazardous, e-waste is to be disposed of at the appropriate facilities that are registered to receive that kind of waste.

9.5.4 Impact Assessment of Soil, Surface and Groundwater

Surface and groundwater impacts may be encountered during the decommissioning phase, especially if development takes place within the rainy season. The operational activities on site should be conducted in a manner to avoid the contamination of surface and groundwater. The assessment of this impact is presented in Table 9-24.

Table 9-24: Assessment of the impacts of the activities on soil, surface, and groundwater

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	

Pre-mitigation	Negative	2	2	2	3	9
Post-mitigation		1	1	1	1	4

9.5.4.1 Mitigations and recommendation to soil, surface, and groundwater

- Contaminated runoff from the various decommissioning activities should be prevented from entering any surface or ground water bodies.
- Disposal of waste from the various activities should be properly managed.
- Contain the newly exposed soil using soil bags, soil savers or suitable geotextile.
- Vegetate areas where heavy machinery was used to excavate the soils to prevent erosion.
- Establish where excavated soils will be placed, and if the area is suitable to receive the excavated soils.
- Cover excavated soils with a suitable cover / temporary liner to prevent contamination.
- Only excavate areas applicable to the project area.
- Have emergency fuel and oil spill kits on site.

9.5.5 Impact Assessment of Health and Safety

Decommissioning activities may cause health and safety risks to people operating on the site. The assessment of this impact is presented in Table 9-25.

Table 9-25: Assessment of the impacts of the proposed activities on health and safety

	Impact Type	Ratings				Significance
		Extent	Duration	Intensity	Probability	
Pre-mitigation	Negative	1	2	1	2	6
Post-mitigation		1	1	1	1	4

9.5.5.1 Mitigations and recommendation to health and safety

- Workers should be provided with awareness training about the risks associated with the proposed decommissioning activities.
- During the works conducted, workers should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, safety glasses etc.
- The contractors should comply with the provisions with regards to health and safety as outlined in the Labour Act (No. 6 of 1992).

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- Sites should be demarcated, and public access should not be allowed to the construction sites to prevent injury or accident due to entry onto a construction site.

10 TERMS OF REFERENCE FOR THE ESIA

This Terms of Reference for the ESIA have been compiled in terms of the content requirements listed in Section 9 of EIA Regulations (2012), and includes:

- (a) A description of all tasks to be undertaken as part of the assessment process, including any specialist to be included if needed;
- (b) An indication of the stages at which the Environmental Commissioner is to be consulted;
- (c) A description of the proposed method of assessing the environmental issues and alternatives; and
- (d) The nature and extent of the public consultation processes to be conducted during the assessment process.

In addition, this section provides the proposed contents of the ESIA.

10.1 Tasks proposed to be undertaken during the ESIA phase

10.1.1 Specialist Studies

During the ESIA Phase, specialist assessments will be undertaken, wherein the significance of the potential impacts will be assessed, and recommendations will be made for mitigation measures. They will compile standalone specialist reports. The specialist disciplines that have been identified as relevant to the project are discussed below:

- Social - The positive impact associated with the project includes the improved availability of water of increased quantity and quality to the residents of the surrounding villages. The potential negative social impacts of the construction phase will impact on the livelihoods of the businesses operating along and people living along the proposed pipeline routes. The cumulative impact on the disruption of business activities and the resultant livelihoods is proposed to be assessed in more detail in the assessment phase.
- Biodiversity (terrestrial ecology) - The Otjombinde constituency is rich in diverse biota which is essential to the rural economy of the population. The ecosystem is dependent on the hydrological cycle. It is proposed that the impact of increased abstraction related to the fauna and flora of the river be assessed in more detail in the assessment phase.

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- Hydrological assessment - The project involves the increase in abstraction of Groundwater. It is proposed that the impacts associated with the total abstraction volumes in relation to the flow of the groundwater as well as the cumulative impact of the increased abstraction to be assessed in more detail in the assessment phase.

Should additional specialist studies be required due to comments and information received during the Draft Scoping Report comment period, the relevant specialists will be appointed to undertake these studies.

The general terms of reference that apply to the specialist studies are as follows:

- Describe the receiving environment and baseline conditions of the existing study area and identify sensitive areas that would need special consideration.
- Review the Scoping phase Comments and Response Report to ensure that all relevant issues and concerns raised by I&APs, relevant to fields of expertise, are addressed.
- Confirm all environmental and social aspects have been identified in the DESR
- . Assess the potential impacts of the proposed project activities and facilities, including any associated cumulative impacts.
- Describe the legislative, permit, policy and planning requirements including requirements by AfDB applicable to the 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 limitations and assumptions).
- Identify and assess alternatives that could avoid or minimise impacts.
- Specialists shall use the assessment methodology for impact prediction and assessment as outlined in Section 8.1.
- Specialists need to consider all (relevant) project execution phases when conducting their respective assessments - i.e. construction, operations and decommissioning phases.
- Specialist reports to include an Executive Summary.

The methodologies to be followed by specialists are as follows:

Terrestrial and Aquatic ecology	<ul style="list-style-type: none"> • The scope includes both vertebrate fauna and flora (aquatic and terrestrial). Vertebrate fauna would include amphibians, reptiles, mammals (small and large) and birds. Flora would include grass, trees and shrubs. • Perform a comprehensive literature review on the existing as well as “recent” relevant publications pertinent to the project. It will include vertebrate fauna and flora (terrestrial) known or expected to occur within and along the sites. This would include rare and endangered (R&E), threatened, protected, endemic, etc. species as determined by the national and International legal status for such species. • Identify important species (vertebrate fauna and flora) of conservation value - i.e. endemic, rare, threatened and endangered species, and Species of Conservation Concern. • Identify vulnerable, threatened or endangered ecological communities and/or habitats. • Compile an Impact Assessment Report, including an assessment of the local natural capital and ecosystem services. • Compile Biodiversity Management Plan to be included in the ESMP
Social	<ul style="list-style-type: none"> • Delimitation of the study area of the project (geographical scope), based on the typology and nature of the project, and the characteristics of the receiving social environment where it will be developed • Secondary data collection (literature review) will be based upon a comprehensive review and analysis of existing information of the following sources: (i) project design information; (ii) research of varied thematic bibliography, including data collected from ESIA's for other projects in the same regions, and other relevant studies and municipal plans; (iii) analysis of topographic and thematic cartography available (such as project specific LiDAR data, land use, cartography produce in the scoping study); and (iv) other data, such as statistic data. The purpose of this survey should not be only to gather a preliminary baseline data about the study area in order to understand the sensitivity of the affected social environment, but also to prepare the basic information that will be used for the field work. The following tasks are proposed: • Interviews will be carried out with local, regional and district authorities, and community leaders. These will be in the form of semi-structured interviews around the following topics (without

	<p>prejudice to other topics that may be identified and/or substituted in the course of work): population and demographic data, population's socio-professional structure; economic relations, health and gender issues, symbolic relations, and other relations, between the populations and the territory; current forms of use of natural resources in access to services; and current and potential sources of conflict over the use of natural resources.</p> <ul style="list-style-type: none"> • Interviews held with a diverse set of key stakeholders from the local population. These interviews will be organised in a collaborative manner with regional and local authorities as well as with local traditional authorities and will seek to ensure the views of all groups, including the most vulnerable (in terms of gender, age and socio-occupational occupation), main health issues and the indigenous peoples. The information to be collected will be organised into a questionnaire following a logical structure, but sufficiently open to accommodate new information that the respondents consider relevant. Updated information will be sought by introducing specific questions to support especially the social and community baseline, understanding the current energy context and communities' expectations about the project. • Analysis of data at both the macro level - with respect to (i) population and population dynamics; (ii) economic activities; (iii) access to water; (iv) cultural aspects (i) identification of the land use; (ii) identification of infrastructures that may be directly affected by the project, such as road network, power lines, etc. • Impact assessment and recommendations • Input with regards to the Grievance Redress Mechanism
Hydrology	<ul style="list-style-type: none"> • A thorough investigation of all available literature pertaining to the site hydrology will be gathered. This will include, but not be limited to, the following: <ul style="list-style-type: none"> • Technical reports and studies carried out on the site. • Meteorological data for the site such as rainfall, runoff and evaporation. • Academic studies pertaining to the hydrology of the site. • Acquirement of any existing topographical survey data of the site. • The layout of the new development will be studied and assessed. • Municipal and National legislation applicable to the project will be obtained and reviewed.

	<ul style="list-style-type: none"> • A publicly available digital elevation model (DEM) of the site will be obtained from the Advanced Land Satellite Observation (ALSO) database • A site visit will be carried out by the hydrologist that will be executing the hydrological analysis. • The following will be assessed on the site visit: <ul style="list-style-type: none"> ○ Topography of the area and prominent topographical features. ○ Surface characteristics of the catchment such as slope, land use, surface cover, soils, and vegetation. ○ All drainage lines, streams and rivers will be examined to understand baseflow, streamflow, channel profile, slope and linings. ○ Any surface water features within the vicinity of the site will be investigated such as pans and dams. ○ All existing stormwater management infrastructure will be measured and recorded. ○ The footprint of the proposed development will be walked over and assessed • All hydrological risks from construction and operational phases will be identified. Mitigations to reduce the risks will be proposed
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10.1.2 Consultation with Environmental Commissioner

The table below outlines the key stages of consultation with the Environmental Commissioner.

Submission of Application to Environmental Commissioner	The Application for Environmental Clearance Certificate for the proposed development was submitted to the Environmental Commissioner on 16 October 2023.
Comment on Draft Scoping Report	The MEFT: DEAF and MAWLR will be notified of the release of the Draft Scoping Report for public comment.
Comment and decision on Final Scoping Report	In terms of Regulation 12 of GN 30, the Environmental Commissioner must either accept or reject the Scoping Report. The Environmental Commissioner must also decide if the proposed listed activity requires a detailed assessment. If so, the Environmental Commissioner must in writing notify the Proponent to prepare an assessment report, and also notify the MAWLR.

Comment on Draft ESIA	Should the Final Scoping Report and Terms of Reference for ESIA be accepted, the Draft ESIA will be compiled. MAWLR will be requested to approve the Draft ESIA after it was made available for public comment. This is to ensure that the Final ESIA contains sufficient information for MEFT: DEAF to make an informed decision.
Comment and decision on Final ESIA	In terms of Regulation 18 of GN 30, the Environmental Commissioner must within 7 days from the date of reviewing the application - (a) in writing notify the proponent and the competent authority of the decision on the application; and (b) on payment of the fee prescribed in Appendix 2 to the regulations, and subject to conditions, if any, issue the Environmental Clearance Certificate

10.1.3 Reporting and Public Participation

The draft ESIA report and ESMP including specialist recommendations and findings, will be compiled once the Scoping Report has been accepted by Ministry of Environment, Forestry and Tourism (MEFT: DEAF). The Assessment Report will incorporate comments and/or changes recommended by the authority. The contents of the Draft Assessment Report are proposed in Section 9.2. The Draft ESIA Report will be circulated for a 12-day public comment period. The ESIA Report and ESMP will be finalised based on input received during the public comment period, and responses will be circulated to all registered I&APs. The ESIA Report and ESMP, will be submitted to the MEFT: DEAF for decision-making. A copy will also be submitted to the Ministry of Agriculture, Water and Land Reform (MAWLR) for consideration. Once a decision has been made, registered I&APs will be notified whether an Environmental Clearance Certificate has been granted or refused.

10.2 ESIA Report Content

It is proposed that the Assessment Report will have the following contents:

- Preliminaries
 - Non-Technical Summary
 - Cover page with name of project, reference number and date
 - Client's name and contact details
 - List of authors and credentials
 - Executive summary

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- List of abbreviations, acronyms
 - Glossary of terms
 - Acknowledgements
 - Table of contents, including appendices, tables, figures.
 - Introduction
 - Description of proposed project
 - Motivation, rationale for the project
 - General environmental background
 - Structure of the DESIA Report (road map)
 - Approach and methodology
 - Terms of reference for the DESIA
 - DESIA process followed
 - Public participation process followed
 - Assumptions, limitations and constraints
 - Public issues and concerns
 - Group and summarise stakeholder issues and concerns
 - Provide detailed issues and responses report in an appendix.
 - Legal and Planning framework
 - Expand on Scoping Report
 - Description of project and alternatives
 - Location, site, power line routes, pipeline routes, road routes and alternatives;
 - Major project components and alternatives;
 - Major inputs - raw materials e.g., power, water, construction materials, chemicals, labour, traffic, etc.;
 - Major outputs - solid and liquid wastes, gaseous emissions, dust, noise, products, etc.;
 - Project timetable per phase.
 - Description of affected biophysical and socio-economic environments.
 - Impact assessment (for each project phase)
-

- Direct, indirect; positive, negative;
- Nature of impact - temporary, permanent; reversible/irreversible; synergistic, antagonistic, cumulative;
- Magnitude and scale - sphere of influence/impact;
- Duration - once-off, construction, life of project, persistent;
- Probability of occurrence;
- Significance;
- Confidence limits;
- Residual impact - after mitigation applied;
- Comparative evaluation of alternatives;
- Cumulative impacts;
- Stakeholder concerns
- Recommended mitigation measures
 - Provide suggestions for mitigation that are feasible, practical, realistic and agreed with MAWLR. The recommended mitigation measures will form the basis of the ESMP.
- Conclusions
 - Compare alternatives and trade-offs;
 - Summarise the main impacts and residual effects after applying mitigation;
 - List the risks and uncertainties relating to the findings and the implications for decision-making;
 - Recommendation to issue Environmental Clearance Certificate.
- Supporting information
 - List of references
- Appendices - all specialist studies, public participation documentation.

11 CONCLUSION

The proposed project aims to improve meet the ever-growing demand for water in Otjombinde Constituency. This Report has been compiled to meet the requirements of the EMA (2007), with the primary aim of informing I&APs of the proposed project and allowing them an opportunity to comment on the project before the Final Scoping Report is submitted to MEFT: DEAF. This report discusses the ESIA process, and the approach taken to the assessment of alternatives, including the motivation for the preferred alternative to be considered in the ESIA phase. It also provides an overview of the baseline environment of the study area.

The Plan of Study for the ESIA is presented in Chapter 9 and outlines how the ESIA is proposed to be undertaken. Specialist studies have been identified on the key potential impacts associated with the project for which sufficient information is not available to assess the impacts in detail. Should any additional specialist studies be required due to comments I&APs, these studies will be undertaken during the ESIA phase.

The draft report was made available to the public and stakeholders for a 12-day comment period. The comments, together with the project team and proponent's responses thereto, is included in the Final Report. Where appropriate, the report will be updated to include these comments.

The Final Report will be submitted to MEFT: DEAF for consideration and decision-making, before commencing with the ESIA phase.

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