Environmental Impact Assessment (EIA) Study: Scoping Report

Environmental Impact Assessment (EIA) Study for the Proposed Installation and Operation of Water, Sewer, Electrical Reticulation Services and associated activities in a New Extension in the Okanguati Settlement Area of the Kunene Region - Application for Environmental Clearance Certificate (ECC)




ECC Application No.:	**APP-005416**
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Proponent:	**Kunene Regional Council** **Private Bag 502 Opuwo, Namibia**

March 2025

DOCUMENT INFORMATION

Title: Environmental Impact Assessment (EIA) Study for the Proposed Installation and Operation of Water, Sewer, Electrical Reticulation Services and Associated Activities in a New Extension in the Okanguati Settlement Area of the Kunene Region - Application for Environmental Clearance Certificate (ECC)

Prepared by:

Author / Environmental Assessment Practitioner (EAP):	Fredrika N. Shagama
Qualifications:	Ph.D. Student: Civil Engineering (Geotechnics & Environmental Hydrogeology), VSB - Technical University of Ostrava, Czech Republic; Post Graduate Diploma in Environmental Studies, International University of Management (IUM), Namibia; MSc. Geological Engineering (*cum laude*) with a focus in Hydrogeology, VSB - Technical University of Ostrava, Czech Republic; BSc. Geological Engineering, VSB - Technical University of Ostrava, Czech Republic
Professional Affiliations:	Environmental Assessment Professionals of Namibia (EAPAN) - Practitioner (Membership No. 183); Geoscience Council of Namibia (GSCN) – Geoscientist, Registration No. GSCN/G-057; International Association of Hydrogeologists (IAH) - Full Member, Membership No.139790; Namibian Hydrogeological Association (NHA) – Member
Contact Details:	Mobile No.: +264 81 749 9223; eias.public@serjaconsultants.com Postal Address: P.O. Box 27318 Windhoek, Namibia
Signature:	
Date:	
PROPONENT DETAILS	
Proponent:	Kunene Regional Council
Name of Representative & Role:	G. P. KAMSEB
Contact details:	0811279733
Signature:	
Date:	28/3/2025

KUNENE REGIONAL COUNCIL
PRIVATE BAG 502, OPUWO
28 MAR 2025
TEL: 065-273950
FAX: 065-273077
CHIEF REGIONAL OFFICER

SERJA'S STATEMENT OF INDEPENDENCE

As the Appointed Environmental Consultant to undertake the EIA Study for the Proposed Installation and Operation of Water, Sewer, Electrical Reticulation Services, and associated activities in a New Extension in the Okanguati Settlement Area of the Kunene Region, Serja Hydrogeo-Environmental Consultants declare that we:

- do not have, to our knowledge, any information or relationship with the Kunene Regional Council (the Proponent), the project design engineers (Arovar Project Engineers) nor the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) that may reasonably have potential of influencing the outcome of this Environmental Assessment and the subsequent Environmental Clearance Certificate (ECC) applied for.
- have knowledge of and experience in conducting environmental assessments, the Environmental Management Act (EMA) No. 7 of 2007, and its 2012 Environmental Impact Assessment (EIA) Regulation, as well as other relevant national and international legislation, guidelines, policies, and standards that govern the project activities as presented herein.
- have performed work related to the ECC application in an objective manner, even if the results in views and findings, or some of these may not be favorable to the Proponent.
- have complied with the EMA and other relevant regulations, guidelines, and other applicable laws as listed in this document.
- declare that we do not have and will not have any involvement or financial interest in the undertaking/implementation of the project activities, other than remuneration (professional fees) for work performed to conduct the EIA and apply for the ECC in terms of the EIA Regulations' requirement as an Environmental Assessment Practitioner (EAP).

Disclaimer: Serja Hydrogeo-Environmental Consultants will not be held responsible for any omissions and inconsistencies that may result from information that was not available at the time this document was prepared and submitted for evaluation.

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Signature:

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

Date: 28 March 2025

EXECUTIVE SUMMARY

Project Background and Location

The Kunene Regional Council (hereinafter referred to as the *Proponent*) proposes to install and subsequently operate water, sewer, and electrical reticulation services in a New Extension on the northeastern edge of Okanguati Settlement, which is located about 110km northwest of Opuwo Town in the Kunene Region.

The New Extension will consist of 593 ervens of which 545 ervens are planned for residential purposes, i.e., residential (545), agriculture (4), urban agriculture (1), SME park (2), business (15), institutional (5), public open space (17), open market (1), and 3 civic ervens. The New Extension layout area to be serviced is 44.5 hectares (Ha) - the area/length of the services will only be provided once the project design is completed by the project engineers (Arovar Project Engineers).

Project Need and Desirability

The installation of water reticulation services would mean that the community in the New Extension has access to clean, potable water for daily activities such as drinking, cooking, cleaning, and sanitation (flushing toilets, cleaning, and washing). Water would also be needed to have enough necessary pressure and volume in case of a fire emergency. Thus, proper water reticulation helps maintain hygiene and public health.

Furthermore, the sewer reticulation services will ensure that the sewer systems carry away waste and wastewater from the New Extension, preventing the contamination of the environment and the spread of disease. Without sewer reticulation, waste would need to be disposed of through septic tanks or other methods, which may not be sustainable or hygienic in the long run. Proper sewer systems also help avoid pollution of groundwater, rivers, and other natural water bodies, protecting the surrounding environment and the local ecosystem.

About electrical reticulation, having a power supply (electricity lines) ensures a reliable supply of electricity to the New Extension for lighting, heating, cooking, and operating appliances. Electricity is essential for modern living and business activities. In addition to that, a proper electrical network ensures that the power supply is safely distributed across the building or development, preventing overloads or hazards such as electrical fires. Moreover, electrical reticulation systems are crucial in supporting technology and infrastructure. This is true because many modern houses and businesses rely on electrical power for technology, internet connectivity, heating/cooling systems, and various other functions. Therefore, proper electrical infrastructure ensures the smooth operation of these services.

It is therefore crucial for this proposed project to be implemented for the continued provision to the Okanguati Settlement, particularly the New Extension. This will also create some temporary employment opportunities for the locals during the construction phase, as well as the ultimate benefits associated with the extension establishment in the Settlement (investment opportunities).

Project Activities

The proposed project activities will involve the installation (construction) of water, sewer, and electrical reticulation services to the New Extension in Okanguati. The services will entail a network of pipes, pumps, and other associated infrastructure required to supply water (from the Settlement's central water source to homes, businesses, and industries in the New Extension). A typical water reticulation system would consist of pipes, valves, fittings, storage tanks, and pumping stations to ensure the water reaches the end-users reliably and safely.

The second proposed service is sewer reticulation, which involves the removal of wastewater from residential, commercial, and industrial areas. Collection and transportation of wastewater (including sewage) from homes, businesses, and industries to a local treatment plant or disposal site. The sewer system will involve a network of sewer pipes, manholes, pumping stations, and a wastewater treatment plant.

The third proposed service is electrical reticulation, which will comprise the connection to the grid, metering, distribution boards, main distribution Board, and circuit breakers/fuses as well as internal wiring and cable routing. Further components for the electrical reticulation system contain lighting and power circuits, outlets, and switches, as well as grounding earthing systems.

The design of these three proposed systems (services) is being prepared by Arovar Project Engineers. Therefore, not yet all available at this stage. However, some preliminary drawings (for water and sewer reticulation networks) have been provided. According to Arovar Project Engineers, with regards to the sewer reticulation system, the preliminary pipe diameter of 160mm has been assumed, whereas the manholes will be spaced at a maximum distance of 100m. Based on the preliminary assessment, there will be a need for lifting/pumping stations.

Added to that, the surface slopes away from the manholes as indicated by the surveyor, there will be a need for the inverts at the ponds to confirm whether there will be a need for a final lifting/pumping station.

Construction phase (workforce and duration): The Proponent will appoint a contractor for the construction (installation) of the services and associated infrastructures. The construction crew will be housed in Okanguati with local labourers commuting from their own houses. The number of workers for construction is unknown at this stage. However, the number of people anticipated for employment will prioritize local employment for locally available skills.

The estimated duration of the construction period is approximately 12 months (1 year). However, this might be adjusted depending on local conditions, including the availability of funds throughout the construction period as well as the efficiency of the installation contractor.

Operation and maintenance phase

This is the phase during which the installed water, sewer, and electrical reticulation services are operational, and maintenance is done by the Proponent. When needed or if the maintenance work cannot be done by the Proponent, this will be outsourced to an external maintenance contractor. The services, utilities, and infrastructure required for the construction works and operational phase in terms of water, power, site access (roads), waste management, project workforce, as well as occupational health and safety aspects, etc., have been identified and provided herein.

Stakeholder and Public Consultation and Engagement

Communication with I&APs and means of consultation employed: communication with stakeholders and I&APs concerning the project activities was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration, and shared with registered stakeholders at the beginning of the EIA process.
- A Stakeholders (I&AP) List was developed and updated throughout the EIA. The BID was shared with the pre-identified key stakeholders, such as the Kunene Regional Council, Epupa Constituency, Okanguati Settlement, and other stakeholders.
- The EIA notices were published in the *New Era* and *Windhoek Observer* newspapers on the 26th of February & 05th of March 2025.
- EIA notices were prepared for printing (posters) that were pasted at the Kunene Regional Council in Opuwo and in Okanguati at the Epupa Constituency Office and Okanguati Settlement Office.
- A consultation meeting was scheduled and held with the stakeholders and the Okanguati community on the 11th of March 2025 at the Agricultural Hall. The meeting was attended by thirty-four (34) people, including one environmental assessment practitioner from Serja HGE Consultants. Minutes were taken from the meeting.

Feedback and Issues raised by the Stakeholders (I&APs): There were no significant issues raised in the consultation meeting, as the stakeholders and I&APs were in full support of the project and would like to see it implemented for the community's benefit. The following key comments were made and summarized as follows.

- How water will be purified should be clarified, as well as the management of solid waste in the Settlement during the installation of these services, and eventually the operation of the New Extension.
- Suggestion to have water supply via a pre-paid manner, like what is done in Otjiwarongo. This is to avoid the piling of water bills among the residents and businesses.

The consultation period ran from the 26th of February 2025 to the 28th of March 2025 to allow sufficient time for the submission of comments.

Concluding remark on stakeholder and public consultation: Minor comments that were raised during the consultation period were not significant enough to object to the proposed project. Stakeholders and I&APs would just like to see the project implemented.

Potential identified positive and adverse (negative) impacts

Positive impacts:

- Socio-economic development through job (employment) creation and skills development, as well as procurement of local services and goods.
- Access to reliable, clean water improves the quality of life by providing safe drinking water for residents and businesses. This reduces the time and labor spent on collecting water from far areas in the Settlement.
- Clean and potable water is essential for sanitation and hygiene in the Settlement, preventing outbreaks of diseases like cholera.
- Provision of a proper sewage system can help prevent contamination of local surface water and groundwater sources by ensuring that untreated sewage is not being discharged into the environment. This reduces the risk of waterborne diseases and improves overall community and environmental health in Okanguati Settlement and surrounding areas.
- The availability of essential services (such as water and sewer) has a great potential to attract residents and investors into the Settlement. Thus, making the Settlement appealing to both current and potential residents and investors, leading to increased property values and the growth of local businesses.
- Electrical reticulation ensures a reliable supply of electricity to the New Extension as it is needed for lighting, heating, cooking, and operating appliances. It is essential for modern living and business activities. A proper electrical network ensures that the power supply is safely distributed across the building or development, preventing overloads or hazards such as electrical fires. Added to that, an electrical reticulation system is crucial in supporting technology and infrastructure, as many modern houses and businesses rely on electrical power for technology, internet connectivity, and heating/cooling systems. Therefore, proper electrical infrastructure ensures the smooth operation of these services.

Potential environmental and social negative (adverse) impacts

- Physical land (soil) disturbance and soil erosion during construction.
- Impact on biodiversity (fauna and flora) and habitat destruction

- Potential soil and groundwater pollution from waste products during construction and operations (in case of sewer pipeline breakages).
- Potential over-abstraction of water resources owing to the required additional volumes to supply the New Extension may result in the depletion of water resources, which may affect local ecosystems.
- Electrical reticulation ensures a reliable supply of electricity to the New Extension, as it is essential for modern living and business activities. A proper electrical network ensures that the power supply is safely distributed across the building or development, preventing overloads or hazards such as electrical fires. The electrical system is crucial in supporting technology and infrastructure.
- General environmental pollution (littering) through mishandling of project-related waste.
- Poorly managed construction waste can contaminate nearby land and waterways, affecting both the local ecosystem and human health.
- Air pollution by potential dust from machinery and excavations during construction.
- Noise associated with the movement of heavy machinery and trucks in the Settlement.
- Occupational and community health and safety: Improper handling of materials and equipment may cause health and safety risks to workers and locals.
- Impact on archaeological and heritage resources through inadvertent unearthing of such resources during earthworks.

In terms of specific negative impacts or risks associated with electrical reticulation installation, these are:

- Risks of electrical shocks are associated with poor installation or incorrect wiring, which can be dangerous for both professionals working on the system and locals or occupants of the New Extension.
- Fire Hazards associated with faulty wiring or overloading circuits could potentially lead to electrical fires. Inadequate grounding, incorrect installation of cables, or damaged wires can increase this risk.
- The impact of increased energy consumption owing to the inefficient design of the reticulation system. This could result in increased energy usage, leading to higher electricity bills. Overloading circuits or installing outdated systems can also cause inefficiencies

Recommendations and Conclusions

The EIA Study for the proposed installation of the water, sewer, and electrical reticulation services was done per the EMA No. 7 of 2007 and its 2012 EIA Regulations, and all the due processes were followed.

Some key potential positive and negative impacts were identified, addressed, and incorporated into this Report. Mitigation measures have been provided in the Environmental Management & Plan (EMP) for implementation to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described and assessed. The potential negative impacts indicated a medium to low rating of significance. To minimize the significance, appropriate management and mitigation measures have been recommended for implementation by the Proponent, their contractors, and workers to avoid and/or minimize their significance on the environment. The effective implementation of these measures, accompanied by monitoring, will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low or low to negligible).

Recommendations

The EIA Study was deemed sufficient and concluded that no further detailed assessments are required for the ECC application for the proposed project. Serja Consultants are therefore confident that the potential negative impacts associated with the project activities can be managed and mitigated by effectively implementing the recommended management and mitigation measures, and with more effort and commitment put into monitoring the implementation of measures. It is, therefore, recommended that the project be granted an ECC, provided that:

- All management and mitigation measures provided are effectively and progressively implemented.
- All required permits, licenses, and approvals for the activities are obtained as required. These include permits and licenses, and ensuring compliance with these specific legal requirements.
- Transparency in communication and continued engagement with stakeholders and communities, or through their leaders, should be maintained throughout the project cycle.
- The Proponent, their project workers, and contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by issuing authorities.
- Disturbed site areas during construction should be rehabilitated as far as practicable. This includes the leveling of stockpiled topsoil, backfilling trenches, and project-associated holes.
- The EMP implementation should be checked and done by the responsible team member onsite (Environmental Control Officer / Safety Officer), and audited by an Independent Environmental Consultant on a bi-annual basis to compile Environmental Monitoring (audit) reports. These reports are to be submitted to the Environmental Commissioner at the DEAF This will be required by the Environmental Commissioner (as part of the ECC conditions).
- From the cumulative impacts' perspective, the following should be considered in the long run:
    - Water resources contamination: oxidation ponds need to be considered for upgrading by demolishing the existing facilities and establishing new, modern sewer oxidation ponds that are lined to protect water resources from contamination.

- Community health and safety (sewer oxidation ponds): Okanguati Settlement through the KRC should regularly maintain the fence and hold regular campaigns for community education and awareness on the importance of keeping the oxidation ponds fenced off (for their safety and to have a sense of property ownership in their Settlement). The issue of cutting mesh wire and razor diamond wire by some community members in local authorities has been proven a common challenge at many waste management facilities (dumpsites and oxidation ponds) for local authorities in Namibia. Community members tend to cut through these fences for different reasons (gaining access to the ponds for ‘’swimming’’ and watering their livestock).

Conclusions

In conclusion, although significant, the identified impacts would not hinder the project activities. However, the recommended measures should be effectively implemented and monitored to ensure that the significance of adverse impacts is reduced to a low where it is medium, and eventually to a negligible significance rating. The effectiveness of the implementation of the management and mitigation measures and EMP compliance will be done by an Environmental Control Officer (ECO) or Safety Officer and audited by an Independent Environmental Consultant on a bi-annual basis. This is to ensure that EMP implementation can be tracked via Bi-Annual Environmental Monitoring exercises and documented in the monitoring reports to the Environmental Commissioner. The monitoring of EMP implementation will not only be done to ensure that the impact's significance is reduced and or maintain a low significance rating, but also to ensure that all potential unforeseen impacts that might arise during implementation are properly identified in time and addressed immediately.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
BID	Background Information Document
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEAF	Department of Environmental Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate

Abbreviation	Meaning
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
KRC	Kunene Regional Council
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
NHC	National Heritage Council (NHC) of Namibia
PPE	Personal Protective Equipment
PVC	Polyvinyl chloride (*the world's third-most widely produced synthetic polymer of plastic*)
Reg, S	Regulation, Section
UNCCD	The United Nations Convention to Combat Desertification

GLOSSARY (KEY TERMS)

Term	Definition
Alternative	A possible course of action, in place of another, would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	The part of the environment that does not originate with human activities (e.g., biological, physical, and chemical processes).
Cumulative Impacts / Effects Assessment	It means the impact of an activity that, in itself, may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal

Term	Definition
Ecological Processes	Processes that play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy, and biological diversity (as an expression of evolution).
Environment	As defined in the Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water, and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan (Draft EMP)	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environmental effects are to be mitigated, controlled, and monitored.
Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity, it includes - (a) any person, group of persons, or organization interested in or affected by an activity; and (b) any organ of the state that may have jurisdiction over any aspect of the activity.
Fauna and Flora	The animals and plants found in an area.
Mitigate	Practical measures to reduce adverse impacts.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of an action on the affected environment
Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Proponent	Organization (private or public sector) or individual intending to implement a development proposal. As defined in the Environmental Management Act, the Proponent is a person who proposes to undertake a listed activity. The Proponent in this case is the Kunene Regional Council.
Public Consultation/Involvement	A range of techniques can be used to inform, consult, or interact with stakeholders affected by the proposed/project activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended.

Term	Definition
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. It can also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of the site and surroundings, and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into the full EIA.
Significant impact	This means an impact that, by its magnitude, duration, intensity, or probability of occurrence, may have a notable effect on one or more aspects of the environment.

1 INTRODUCTION

1.1 Project Background and Location

The Kunene Regional Council (hereinafter referred to as the *Proponent*) proposes to install and subsequently operate water, sewer, and electrical reticulation services in a New Extension on the northeastern edge of Okanguati Settlement, which is located about 110km northwest of Opuwo Town in the Kunene Region, as shown in Figure 1-1.

The New Extension will consist of 593 ervens of which 545 ervens are planned for residential purposes, i.e., residential (545), agriculture (4), urban agriculture (1), SME park (2), business (15), institutional (5), public open space (17), open market (1), and 3 civic ervens - Figure 1-2. The Extension layout area to be serviced is 44.5 hectares (Ha) - the area/length of the services will only be provided once the project design is completed by the project engineers (Arovar Project Engineers).

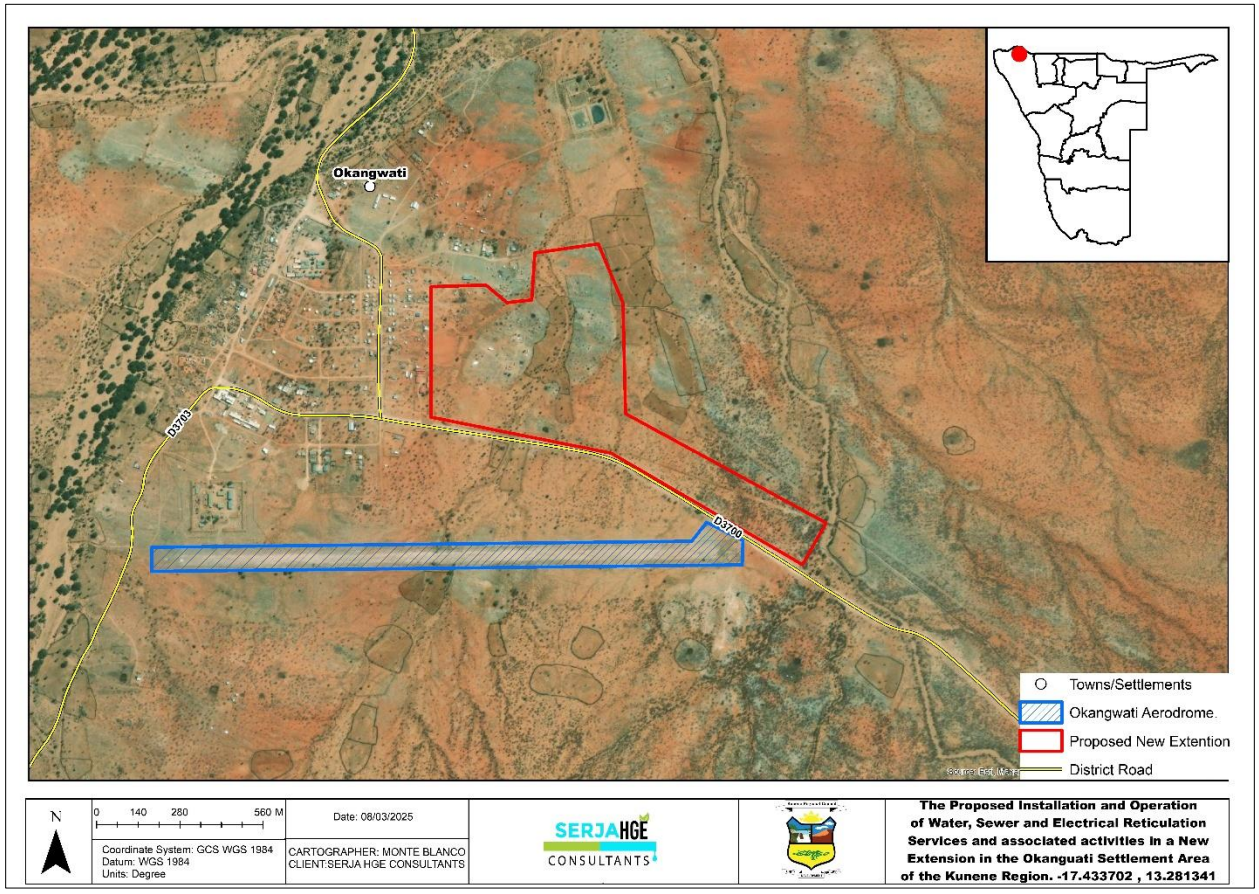


Figure 1-1: Locality map of the proposed area for the installation of water, sewer, and electrical reticulation services in Okanguati Settlement, Kunene Region

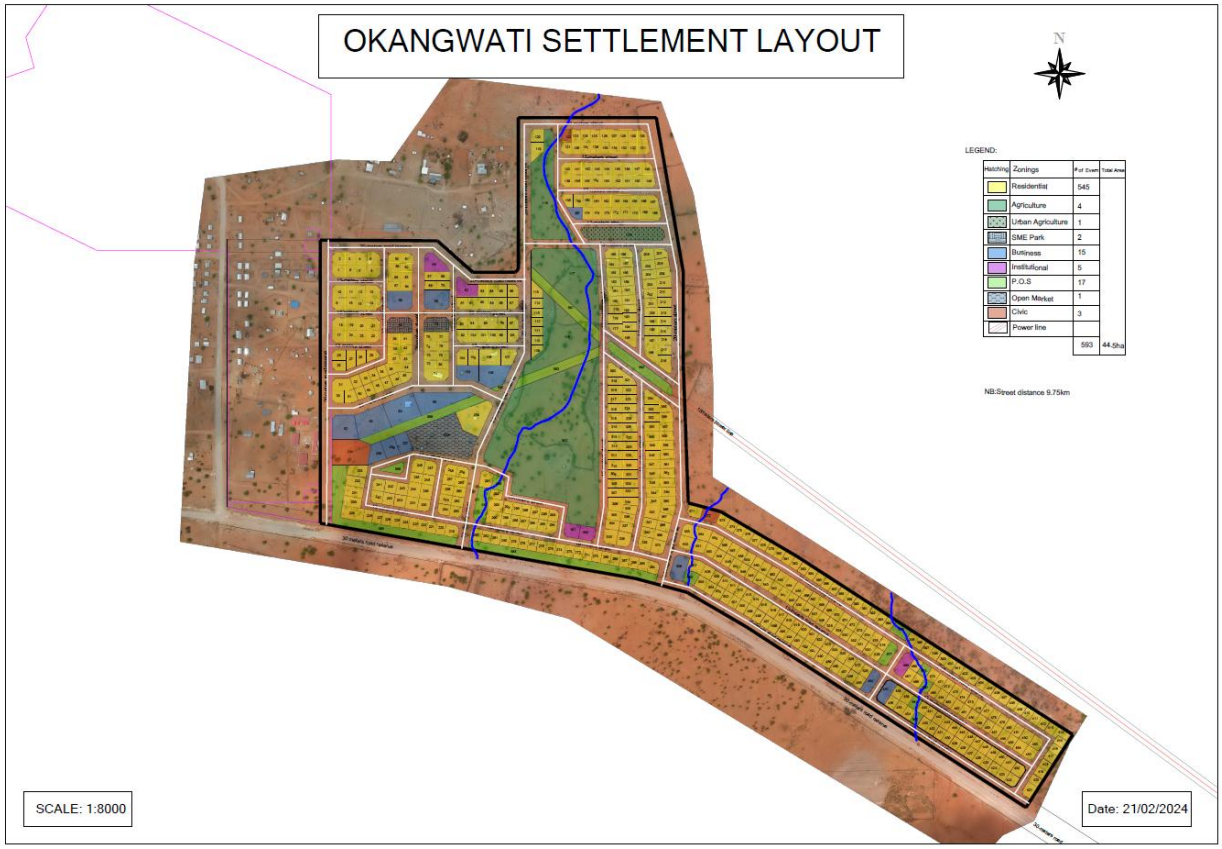


Figure 1-2: Okanguati Settlement Layout showing the proposed New Extension for which the proposed services will be installed and operated

1.2 The Project Need and Desirability

Basic services and infrastructures in local authorities play a crucial role in ensuring convenience, hygiene, health, and safety for residents and businesses. In the case of the proposed services in Okanguati, the installation of water reticulation services would mean that the community in the New Extension has access to clean, potable water for daily activities such as drinking, cooking, cleaning, and sanitation (flushing toilets, cleaning, and washing). Water would also be needed to have enough necessary pressure and volume in case of a fire emergency. Thus, proper water reticulation helps maintain hygiene and public health.

Furthermore, the sewer reticulation services will ensure that the sewer systems carry away waste and wastewater from the New Extension, preventing the contamination of the environment and the spread of disease. Without sewer reticulation, waste would need to be disposed of through septic tanks or other methods, which may not be sustainable or hygienic in the long run. Proper sewer systems also help avoid pollution of groundwater, rivers, and other natural water bodies, protecting the surrounding environment and the local ecosystem.

About electrical reticulation, having a power supply (electricity lines) ensures a reliable supply of electricity to the New Extension for lighting, heating, cooking, and operating appliances. Electricity is essential for modern living and business activities. In addition to that, a proper electrical network ensures that the power supply is safely distributed across the building or development, preventing overloads or hazards such as electrical fires.

Moreover, electrical reticulation systems are crucial in supporting technology and infrastructure. This is true because many modern houses and businesses rely on electrical power for technology, internet connectivity, heating/cooling systems, and various other functions. Therefore, proper electrical infrastructure ensures the smooth operation of these services.

It is therefore crucial for this proposed project to be implemented for the continued provision to the Okanguati Settlement, particularly the New Extension. This will also create some temporary employment opportunities for the locals during the construction phase, as well as the ultimate benefits associated with the New Extension establishment in the Settlement (investment opportunities).

1.3 The Need for an Environmental Clearance Certificate (ECC)

The proposed project (installation of water and sewer reticulation services) and associated activities fall under the listed activities in the Environmental Impact Assessment (EIA) Regulations (2012) of the Namibian Environmental Management Act (EMA) No. 7 of 2007 that need to be issued an Environmental Clearance Certificate (ECC). The relevant listed activities are:

1. ENERGY GENERATION, TRANSMISSION, AND STORAGE ACTIVITIES

-Listed Activity 1: The construction of facilities for -

(b) The transmission and supply of electricity.

2. WASTE MANAGEMENT, TREATMENT, HANDLING, AND DISPOSAL ACTIVITIES

-Listed activity 2.1: The construction of facilities for waste sites, treatment of waste, and ***disposal*** *of waste*

5. LAND USE AND DEVELOPMENT ACTIVITIES

-Listed activity 5.1: The rezoning of land from (d) use for nature conservation or zoned open space to any other land use.

8. WATER RESOURCE DEVELOPMENTS

-Listed activity 8.1 The abstraction of ground or surface water for industrial or commercial purposes

-Listed activity 8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems.

10. INFRASTRUCTURE

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

Subsequently, to comply with the EMA and its EIA Regulations and ensure environmental sustainability, the Proponent has appointed Serja Hydrogeo-Environmental Consultants CC (Serja HGE Consultants), independent environmental consultants, to apply for the ECC on their behalf. Thus, an ECC application has been launched with the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF).

Upon screening of this Background Information Document (BID), an Environmental Scoping Report and Environmental Management Plan (EMP) are required in an application for the ECC. The required documents (Scoping Report and EMP) will be submitted to the MEFT for evaluation and consideration of the ECC by the Environmental Commissioner.

The purpose of the EIA Study and subsequent issuance of the ECC is therefore to ensure that the project activities are undertaken in an environmentally & socially friendly and sustainable manner. This would be ensured through the effective implementation of recommended environmental management measures to minimize the adverse identified impacts while maximizing the positive impacts.

1.4 Appointed Independent Environmental Consultant

To comply with the EMA and its Regulations and ensure environmental management, protection, and sustainability, the Proponent through the construction contractor appointed Serja Hydrogeo-Environmental Consultants CC, Independent Environmental Consultants to apply for the ECC and conduct the required Environmental Assessment Process, which includes Public Consultation and prepare the Environmental Scoping Report and EMP (Appendix A).

The EIA process (stakeholder / public consultation and engagement, including consultation meeting facilitation) and environmental mapping were conducted and done by Mr. Stefanus Johannes, respectively. Mr. Johannes is an experienced Environmental Assessment Practitioner (EAP) and qualified and experienced GIS Specialist/Cartographer with over 4 years of experience in Natural Resources Management Consulting and Mapping (Geospatial Analysis). The EIA Scoping, EMP, and associated documents were compiled by Ms. Fredrika Shagama. Ms. Shagama is a qualified and experienced Hydrogeologist and Environmental Assessment Practitioner by training and experienced with over 10 years of experience in Groundwater and Environmental Management Consulting. The CVs of the two Environmental Assessment Practitioners are attached to this Report as Appendix B.

1.5 Application for the Environmental Clearance Certificate

The application for the ECC process was done as follows:

- Preparation of the Background Information Document (BID) for the project activities,
- Launching of the ECC application on the ECC Portal of the MEFT with the Proponent details (accompanied by the BID) for project registration purposes and obtaining a MEFT application/reference number (APP-005416),

- Completion of Form 1 (Section 32) of the EIA Regulations with the required project and Proponent information, and
- Submission of the printed hard copy of the ECC application (with affixed NAD300 revenue stamps as application fees attached hereto) is submitted to the MEFT. The MEFT's date-stamped copy of the ECC application is uploaded on the ECC Portal as proof of application and payment.

The next component of the ECC application was to undertake an EIA process, which entails a baseline assessment of the biophysical and social environments as well as public consultation and engagement. The findings of the EIA process are then incorporated into a Scoping Report, and an EMP is also developed for the mitigation of potential adverse impacts anticipated from the project activities. The two documents and associated documents (appendices) are then submitted to the Environmental Commissioner at the Department of Environmental Affairs and Forestry at MEFT for evaluation and consideration of the ECC.

1.6 Scope of Work and Report Contents

This Study has been conducted according to the EMA No. 7 of 2007, and its 2012 EIA Regulations as mentioned in the preceding subsections, i.e., the project requires an ECC. Therefore, the process has been undertaken as required and guided by the Regulations. This Report has been compiled as a required output of an environmental assessment process after the ECC application has been launched with MEFT. The Scoping Report, together with the EMP and all its appendices, will be submitted to the DEAF. The document (report) covers the following chapters or sections, in addition to the introductory chapter:

- Project description and associated activities - (Chapter 2).
- Project alternatives considered (the environmentally friendly and technically feasible) - Chapter 3.
- The legal requirements governing the project and its related activities, i.e., the legislation that the project activities must comply with (Chapter 4).
- The environmental and social baseline of the project area - Chapter 5.
- The Public consultation and engagement process was undertaken to inform, invite, and engage the public (stakeholders and interested & affected parties) on the project activities - Chapter 6.
- The assessment of identified potential impacts associated with the project activities (Chapter 7) - This chapter presents both the positive, negative, and cumulative impacts, assessment methodology, and the assessment of the negative impacts. The mitigation measures in the form of management action plans, with a timeframe and implementation responsibilities, are in the EMP.
- The recommendations and conclusions of the environmental assessment are presented in Chapter 8. The data sources consulted for the assessment are listed under Chapter 9.

Based on the information provided by the Proponent and the EAP's experience, a description of the project activities is presented in the next chapter.

2 DESCRIPTION OF THE PROJECT ACTIVITIES

2.1 Project Overview

The proposed project activities will involve the installation (construction) of water, sewer, and electrical reticulation services to the New Extension in Okanguati. The services will entail a network of pipes, pumps, and other associated infrastructure required to supply water (from the Settlement's central water source to homes, businesses, and industries in the New Extension). A typical water reticulation system would consist of pipes, valves, fittings, storage tanks, and pumping stations to ensure the water reaches the end-users reliably and safely.

The second proposed service is sewer reticulation, which involves the removal of wastewater from residential, commercial, and industrial areas. The collection and transportation of wastewater (including sewage) from homes, businesses, and industries to a local treatment plant or disposal site.

The sewer system will involve a network of sewer pipes, manholes, pumping stations, and a wastewater treatment plant. The preliminary pipe diameter of 160mm has been assumed for the sewer reticulation system, whereas the manholes will be spaced at a maximum distance of 100m. Based on the preliminary assessment, there will be a need for lifting/pumping stations.

Added to that, the surface slopes away from the manholes indicated by the surveyor, there will be a need for the inverts at the ponds to confirm whether there will be a need for a final lifting/pumping station.

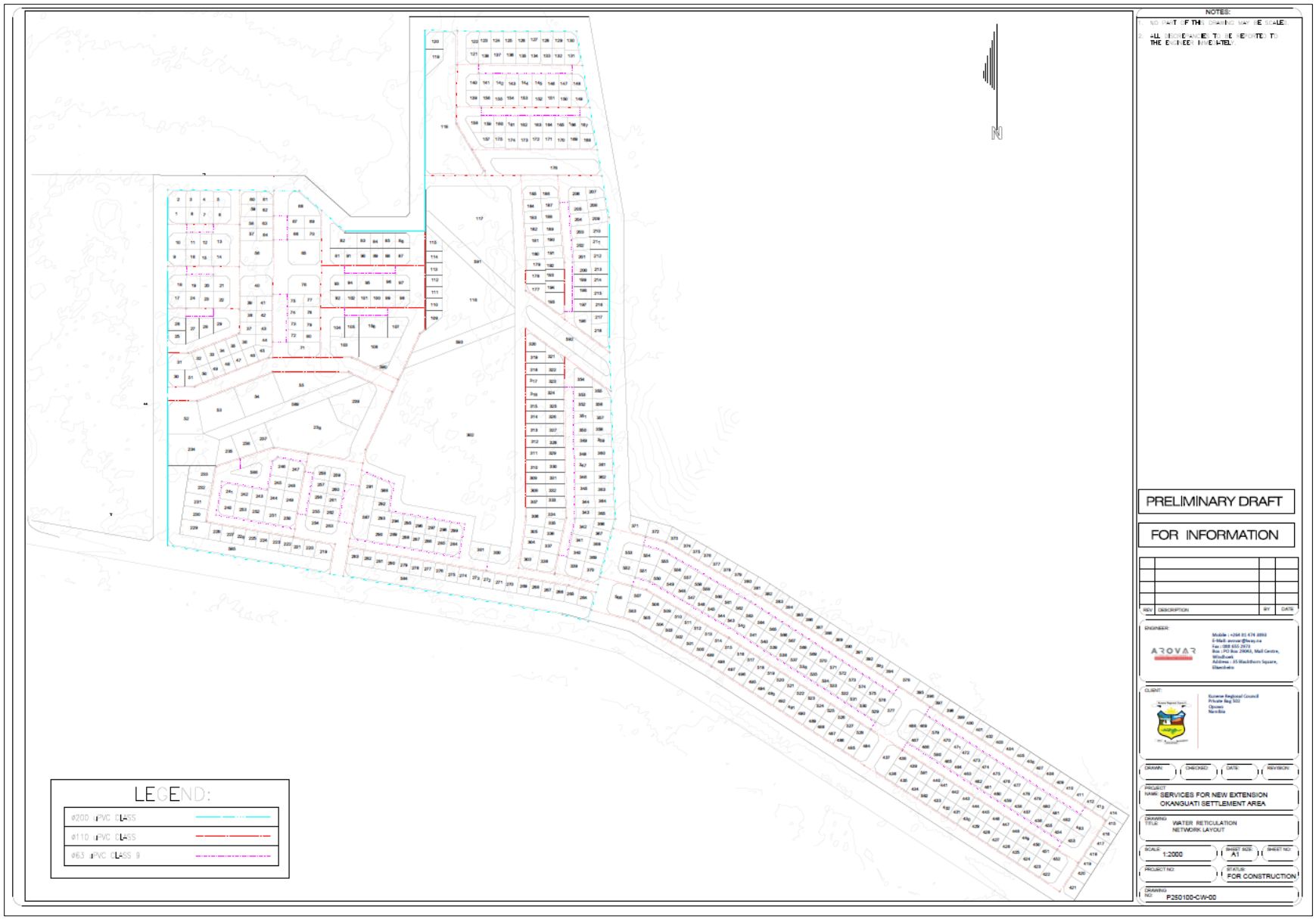
The third proposed service is electrical reticulation, which will comprise the connection to the grid, metering, distribution boards, main distribution Board, and circuit breakers/fuses as well as internal wiring and cable routing. Additional components for the electrical reticulation system include lighting and power circuits, outlets, switches, and grounding earthing systems.

2.2 Project Design

Arovar Project Engineers (design engineers) are still finalizing the design of these three proposed systems (services). However, some preliminary draft drawings or concepts (for the water and sewer reticulation system network layout) are shown in Figure 2-1 and Figure 2-2, as well as attached hereto clearly as Appendix C.

According to Arovar Project Engineers, with regards to the sewer reticulation system, the preliminary pipe diameter of 160mm has been assumed, whereas the manholes will be spaced at a maximum distance of 100m. Based on the preliminary assessment, there will be a need for lifting/pumping stations.

Added to that, the surface slopes away from the manholes as indicated by the surveyor, there will be a need for the inverts at the ponds to confirm whether there will be a need for a final lifting/pumping station.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DRAWING TITLE: WATER RETICULATION NETWORK LAYOUT
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SHEET NO:
PROJECT NO:
STATUS: FOR CONSTRUCTION
DRAWING NO: P250100-CW-00

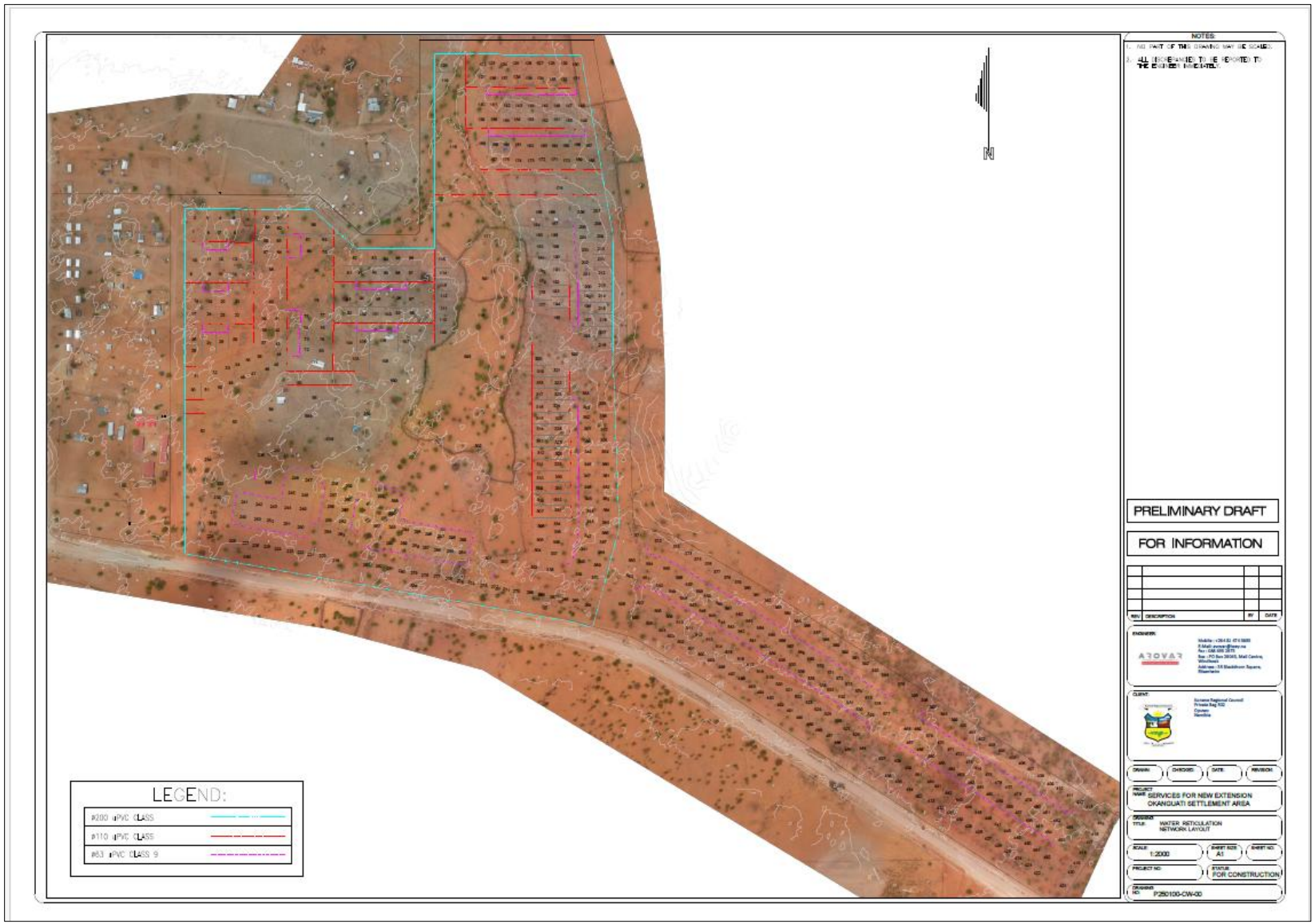

Figure 2-1: Available preliminary draft drawings of the proposed water reticulation network of the New Extension in Okanguati Settlement (source: Arovar Project Engineers, 2025)


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DRAWING TITLE: SEWER RETICULATION NETWORK LAYOUT - LOCALITY VIEW
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PROJECT NO:
STATUS: FOR INFORMATION
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160mm uPVC SEWER PIPE
SEWER MANHOLE

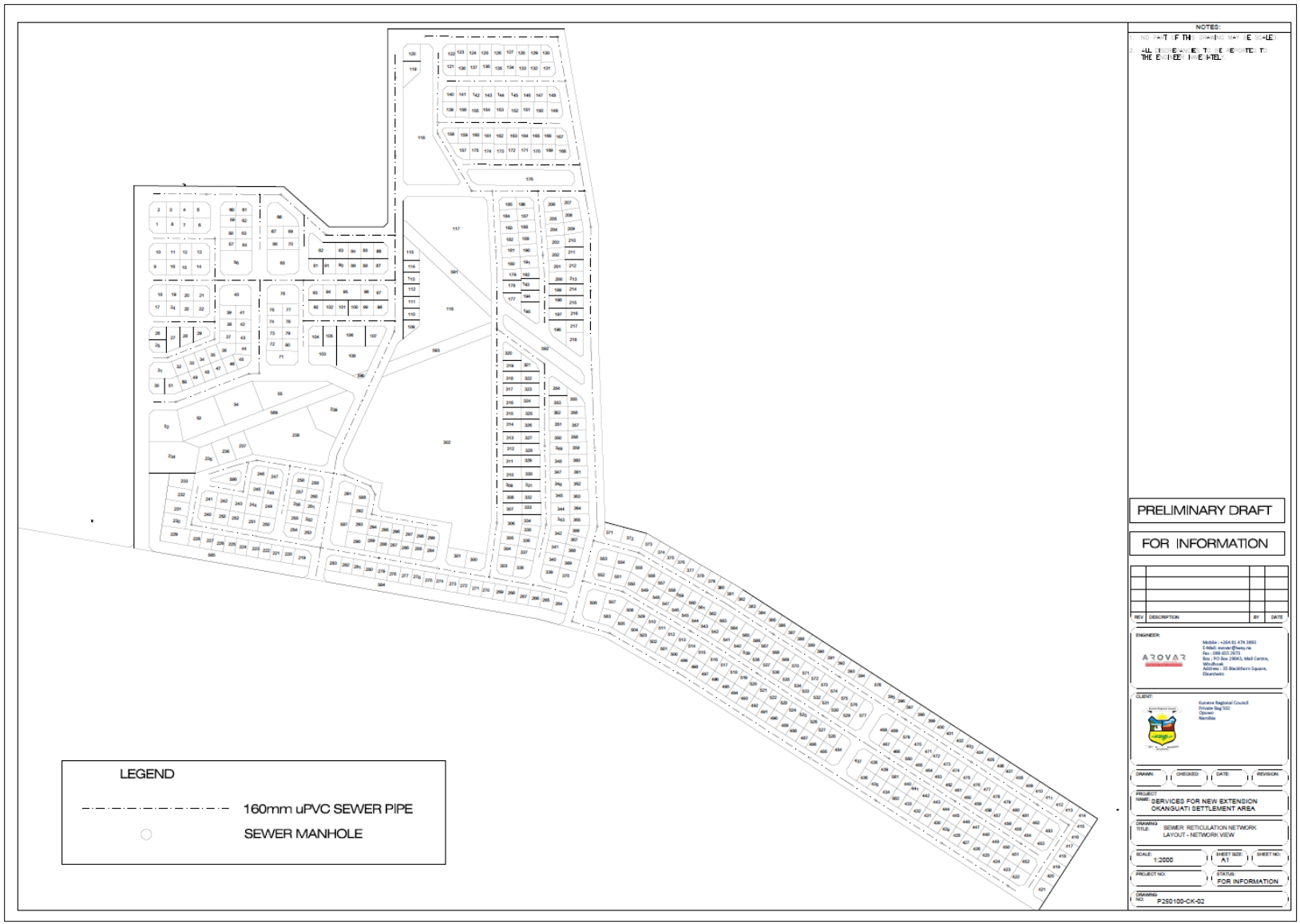


Figure 2-2: Available preliminary draft drawings of the proposed sewer reticulation network of the New Extension in Okanguati Settlement (source: Arovar Project Engineers, 2025)

2.3 Construction Phase

2.3.1 Construction workforce and duration

The Proponent will appoint a contractor for the construction (installation) of the services and associated infrastructures. The construction crew will be housed in Okanguati with local labourers commuting from their own houses. The number of workers for construction is unknown at this stage. However, the number of people anticipated for employment will prioritize local employment for locally available skills.

The estimated duration of the construction period is approximately 12 months (1 year). However, this might be adjusted depending on local conditions, including the availability of funds throughout the construction period as well as the efficiency of the installation contractor.

2.3.1.1 Construction Services and Utilities

The services and utilities required during the construction phase include:

- Water supply: water required for the installation works will be sourced from the Settlement's water supply scheme. The amount of water required will not be significant, but the volume is not yet known.
- Electricity (power supply): A diesel generator will be used for the installation works. The generator will be provided by the appointed contractor.
- Sewage (toilets): Portable toilets will be supplied by the appointed contractor on site for the workers. The contractors will remove the toilets upon completion of construction works.
- Solid waste management: the waste will be collected in a secure central place onsite, removed from the area, and disposed of at the local waste management site (in Okanguati). If not possible, the waste will be transported to Opuwo's solid waste management facility as appropriate.
- Occupational health and safety: all project workers will be supplied with appropriate and adequate personal protective equipment (PPE) while carrying out project activities onsite. The site will also be equipped with one fully furnished first aid kit.
- Accidental fire outbreaks: The site will be equipped with fire extinguishers in case of accidental fire outbreaks during installation (construction) work.
- Road access: The project-related vehicles will use the existing access roads in the Settlement to gain access to the site area. The nearest road to the New Extension is D3700.

2.4 Decommissioning and Rehabilitation of Disturbed Areas on-site

Once construction is completed, the construction (installation) contractor will need to implement site rehabilitation measures. Decommissioning and rehabilitation are primarily reinforced through either progressive rehabilitation while construction work is ongoing or rehabilitating disturbed sites after completion of work, which consists of safety, health, environmental, and contingency aspects. For safety, health, and the environment, rehabilitation of the site post-construction will include the following:

- Dismantling and removal of construction campsites and associated infrastructures from the project sites,
- Carrying away all project equipment and vehicles, and
- Clean up of site working areas and transporting the recently generated waste to the nearby approved waste management facility (as per agreement with the waste facility owner),

Further decommissioning and rehabilitation practices at the site will include:

- Backfilling of all holes and trenches (if any) associated with the construction activities in the area,
- Closing and capping of road construction holes to ensure that they do not pose a risk to both people and animals in the area, and
- Levelling of stockpiled topsoil, which will be done to ensure that the disturbed site areas are left as close to their original state as possible.

The next chapter is the presentation of different and relevant alternatives considered for the project activities.

2.5 Operation and Maintenance Phase

This is the phase during which the installed water, sewer, and electrical reticulation services are operational, and maintenance is done by the Proponent. When needed or if the maintenance work cannot be done by the Proponent, this will be outsourced to an external maintenance contractor. This is also the stage during which the New Extension is fully established and operational, and all the services are serving the residential and business properties.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section will highlight the different ways in which the project can be undertaken, and identify the alternative that will be the most practical, but least damaging to the environment, is identified.

Once the alternatives have been established, these are examined by asking the following three questions:

- *What alternatives are technically and economically feasible?*
- *What are the environmental effects associated with the feasible alternatives?*
- *What is the rationale for selecting the preferred alternative?*

The alternatives considered for the project activities are presented below.

3.1 The "No-Go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. Should the proposal to establish the New Extension be halted or stopped completely, there would be no functional extension in Okanguati, as there would be no services catering to it. Consequently, none of the potential impacts (positive and negative) identified would occur. If the project activities are to be discontinued, the status quo of the land will remain unchanged. This option was considered, and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative was undertaken to establish what benefits might be lost if the project is not implemented.

Moreover, the installation of these services would ensure that there is guaranteed hygiene, access to clean water, proper sewer and electrical reticulation, and ensure that sewage and electricity supply to the New Extension’s residential and commercial properties. There will also be some job opportunities that will generate income for the youth, given the unemployment situation in the Kunene Region and Namibia at large.

Based on the above, the “no-go” alternative is not favorable and, therefore, not considered a viable option.

The following chapter presents the national and international legal requirements that are applicable and relevant to the project.

4 APPLICABLE LEGAL FRAMEWORK

The project's activities or some of them may be regulated and governed by certain legal policies. Therefore, it is necessary to review and consider these legislations and legal requirements. These legal requirements are either local (institutional), national (Namibian), or international legislation, policies, guidelines, etc. The review of the relevant legal framework serves to inform the project Proponent, 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 to establish the project activities.

4.1 National Legal Framework: Laws, Policies, and Regulations

The national applicable legal framework and policies relevant to the project are presented in Table 4-1.

Table 4-1: List of applicable legislation for the project activities

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The Constitution of the Republic of Namibia, 1990 as amended	The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include: "…the duty to investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at: "…Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State."	By implementing the environmental management plan, the establishment will conform to the constitution in terms of environmental management and sustainability. Ecological sustainability will be a main priority for the project.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Environmental Assessment Policy of Namibia 1994	The policy defines the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical, and political components and provides a reference to the inclusion of alternatives in all projects, policies, programs, and plans.	This EIA outlines the environmental consequences of this project and considers the definition of the Environment.
Environmental Management Act No. 7 of 2007 and its 2012 EIA Regulations	The Act aims to ensure that the potential impacts of the development on the environment are considered carefully and in good time; that all interested and affected parties have a chance to participate in the environmental assessments and that the findings of the environmental assessments are fully considered before any decisions are made about activities which might affect the environment.	The Act aims to promote sustainable management of the environment and the use of natural resources. The EMA is broad; it regulates land use development through environmental clearance certification and/or Environmental Impact Assessments. The Act provides for the clearance certification for the installation of service infrastructures. An ECC should be obtained for the proposed project and renewed every three years.
Electricity Act 4 of 2007	To provide for the requirements and conditions for obtaining licenses for the provision of electricity; to provide for the powers and obligations of licensees.	The New Extension will be supplied with electricity from the existing power grid in the Settlement. Therefore, the Proponent needs to ensure that the reticulation service (system) is environmentally certified and arrangements are made with the Northern Regional Electricity Distributor (NORED) on additional power requirements in the Settlement to supply the New Extension.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under the authority of a license or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 liters or less in any container kept at a place outside a local authority area"	If there are plans to store fuel onsite in a container of 600 liters, the Proponent should apply for and obtain the consumer installation certificate from the Petroleum Directorate at the Ministry of Mines & Energy (MME).

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Hazardous Substance Ordinance, No. 14 of 1974	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal, and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent, through the construction contractor, should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment.
Local Authorities Act 23 of 1992	To provide for the determination, for purposes of local government, of local authority councils; the establishment of such local authority councils; and to define the powers, duties, and functions of local authority councils; and to provide for incidental matters.	The Okanguati Settlement Council, which hosts the project site, is considered an Interested &Affected Party and must be consulted during the Environmental Assessment (EA) process.
The Regional Councils Act (No. 22 of 1992)	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 "to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanization patterns, natural resources, economic development potential, infrastructure, land utilization pattern and sensitivity of the natural environment.	The relevant Regional Councils are I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Kunene Regional Council, which is also the project proponent, and under the Epupa Constituency.
Urban and Regional Planning Act No. 5 of 2018	To provide a legal framework for spatial planning in Namibia; to provide for principles and standards of spatial planning; to establish the urban and regional planning board; to decentralize certain matters relating to spatial planning; to provide for the preparation, approval, and review of the national spatial development framework, regional structure plans and urban structure plans; to provide for the preparation, approval, review, and amendment of zoning schemes.	The Proponent should adhere to the structure plans of the Settlement and apply for land and approval for the zoning corresponding to the project's nature.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
	The Act further provides for the establishment of townships; to provide for the alteration of boundaries of approved townships, to provide for the disestablishment of approved townships; to provide for the change of name of approved townships; to provide for the subdivision and consolidation of land; to provide for the alteration, suspension, and deletion of land-related conditions.	
Town Planning Ordinance No. 18 of 1954):	This ordinance provides guidelines for town planning, zoning, and land use, which would affect the establishment of student accommodation complexes in urban areas.	The Proponent should ensure that the site is rezoned to its intended use and consolidated before commencing with the construction works.
Water Resources Management Act (No 11 of 2013) and its 2023 Water Regulations	The Act provides for the management, protection, development, use, and conservation of water resources; provides for the regulation and monitoring of water services, and provides for incidental matters. The objects of this Act are to: 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).	The protection (both quality and quantity/abstraction) of water resources should be a priority. Relevant permits and or agreements to abstract and use water should be applied for and obtained.
National Heritage Act No. 27 of 2004	To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.	The Proponent should ensure compliance with these Acts' requirements. The necessary management measures and related permitting requirements must be taken.
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
		The guidance is done by consulting with the National Heritage Council of Namibia. A Chance Finds Procedure provided to the Draft EMP should be implemented upon discovery of archaeological and heritage resources.
Soil Conservation Act (No 76 of 1969)	The Act makes provision for the prevention and control of soil erosion and the protection, improvement, and conservation of soil, vegetation, and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001	The Act provides for the management and use of forests and forest products. Section 22. (1) provides: "Unless otherwise authorized by this Act, or by a license issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or a gully unless the cutting, destruction or removal is done to stabilize the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."	If there is a need to remove protected species such as the Mopane trees that are onsite, the Proponent will need to apply for the relevant permit under this Act.
National Solid Waste Management Strategy	The Strategy ensures that the future directions, regulations, funding, and action plans to improve solid waste management are properly coordinated and consistent with national policy, and to facilitate cooperation between stakeholders.	The construction of the services infrastructure can potentially generate a significant amount of solid waste (stockpiles, soil remains, rubble) that might need proper management by contractors to avoid pollution. Waste management plans should be generated and implemented before the commencement of civil works and during project operations.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
	Waste disposal is the main problem with the current solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.	Contractors and KRC should reduce the risk of solid waste to the environment and surroundings of the project area.
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 should ensure compliance with the provisions of these legal instruments.
Public and Environmental Health Act No. 1 of 2015	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding the health and safety of laborers.	
Atmospheric Pollution Prevention Ordinance (1976)	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for section 4(1) (a) of the ordinance.	The project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented.
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Labour Act (No. 6 of 1992)	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labor relations through promoting social justice, occupational health and safety, and enhanced labor market services for the benefit of all Namibians. This ministry ensures effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the project activities do not compromise the safety and welfare of workers.

4.2 International policies, principles, standards, treaties and conventions

4.2.1 Applicable international statutes (treaties and conventions) and policies

The other international statutes such as policies, standards, and conventions that may govern the project activities are provided under Table 4-2 below.

Table 4-2: Other international treaties and conventions governing the project activities

Statue	Relevant Provisions	Implications for the Project / Requirements
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention's objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability, the United Nations Convention	The project activities should not be undertaken such that they contribute to desertification.
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, to ensure their conservation and sustainable use. The Convention promotes the protection of ecosystems, and natural habitats, and the maintenance of viable populations of species in natural surroundings.	The removal of vegetation cover and destruction of natural habitats should be avoided, and where not possible, minimized.

Statue	Relevant Provisions	Implications for the Project / Requirements
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

Other relevant international Treaties and Protocols ratified by the Namibian Government are the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973, Convention on Biological Diversity, 1992, and World Heritage Convention, 1972.

In addition to the project description, and legal framework, it is also important to note that the project activities are undertaken in a specific environment, in terms of biophysical and social. Therefore, understanding these existing environmental features before the project activities is crucial for the assessment of the potential impacts stemming from the project activities on the features.

5 BIOPHYSICAL AND SOCIAL BASELINE

The proposed services installation and associated activities will be undertaken in specific environmental and social conditions. Therefore, understanding the pre-project conditions of the environment aids in describing the status quo versus future projections of environmental conditions once the project is implemented. The baseline information also aids in identifying the sensitive environmental features and how best suitable management and mitigation measures can be recommended for implementation. The summary of selected biophysical and social baseline information about the project area is given below.

The baseline information presented below is sourced from the environmental site visit (done on the 11th of March 2025), online sources ranging from old reports, books, and publishing, as well as other relevant research information in the broader area. The project baseline that is deemed necessary for the project activities is as follows.

5.1 Biological Environment

The description of the biological (faunal and floral) environment of the area is presented below.

5.1.1 Fauna

The project site is within a settlement boundary, which is surrounded by a communal area where livestock farming is practiced. The common livestock kept in the villages within proximity of Okanguati and further are goats, sheep, donkeys, horses, and cattle.

Regarding wildlife, the community indicated that there are springboks, kudu, ostriches, cheetahs, leopards, and elephants in the area. Hence, the presence of campsites in the Okanguati area for wildlife tourism (eco-tourism).

5.1.2 Flora

The vegetation structure of the project area is characterized by sparse shrubland as shown on the vegetation map in Figure 5-1.

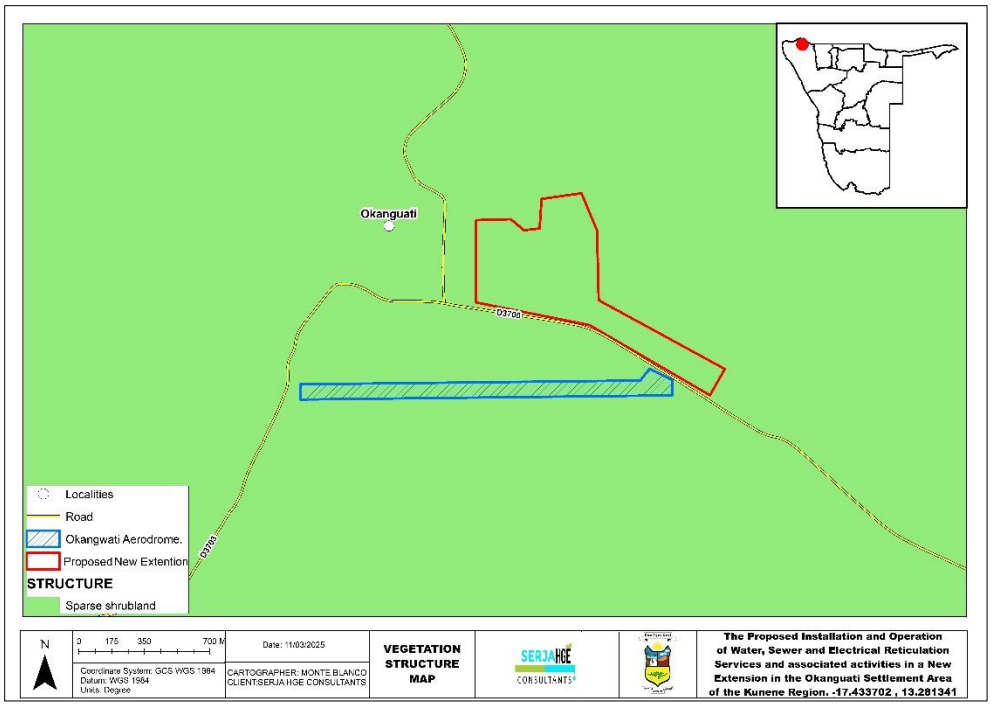


Figure 5-1: Vegetation structure map in the project area

The observed vegetation during the site visit on and around the site is as follows and shown in Figure 5-2.

- Dominant trees and shrubs of Mopane (*Colophospermum mopane*) – protected,
- Shrubs of bitterbush/stinkbush (*Pechuel-loeschea leubnitziae*), and
- Purple-pod cluster-leaf or purple-pod terminalia (*Terminalia prunioides)* – protected.

Figure 5-2: Vegetation observed on and around the site (young Mopane trees and purple-pod terminalia, as well as stinkbush shrubs)

5.2 Physical Environment

5.2.1 Climate

The climatic conditions of northern Namibia are classified as semi-arid. The climatic information for Okanguati was obtained from World Weather Online (2025) and these are summarized below:

- Rainfall: The average rainfall for the Okanguati area ranges between 225 and 240mm per year, from December to March.
- Temperatures: The maximum temperatures have been recorded around October at 37°C, while the average high temperature is 35°C in September and October. The minimum temperature is 10°C in June, and the average low temperature is 12°C around June and July.

5.2.2 Landscape and Topography

The landscape of the project site is characterized by Etanga-Epembe plains as shown in Figure 5-3. These plains consist of two broad, relatively flat plains surrounded and separated by the rugged Kaokoveld Hills. Ephemeral streams in the southern area flow southwards into the Hoarusib River. The geology underlying these plains is like that of the surrounding hills. At elevations of over 1,100 meters above sea level, these plains are high above the low-lying Coastal Plain to the west and are thought to have possibly formed as a result of glaciation.[1]

Okanguati has elevations ranging between 951 and 1,216 meters above sea level (masl) as shown on the topographic map in Figure 5-3 below.

[1] https://atlasofnamibia.online/chapter-1/landscapes

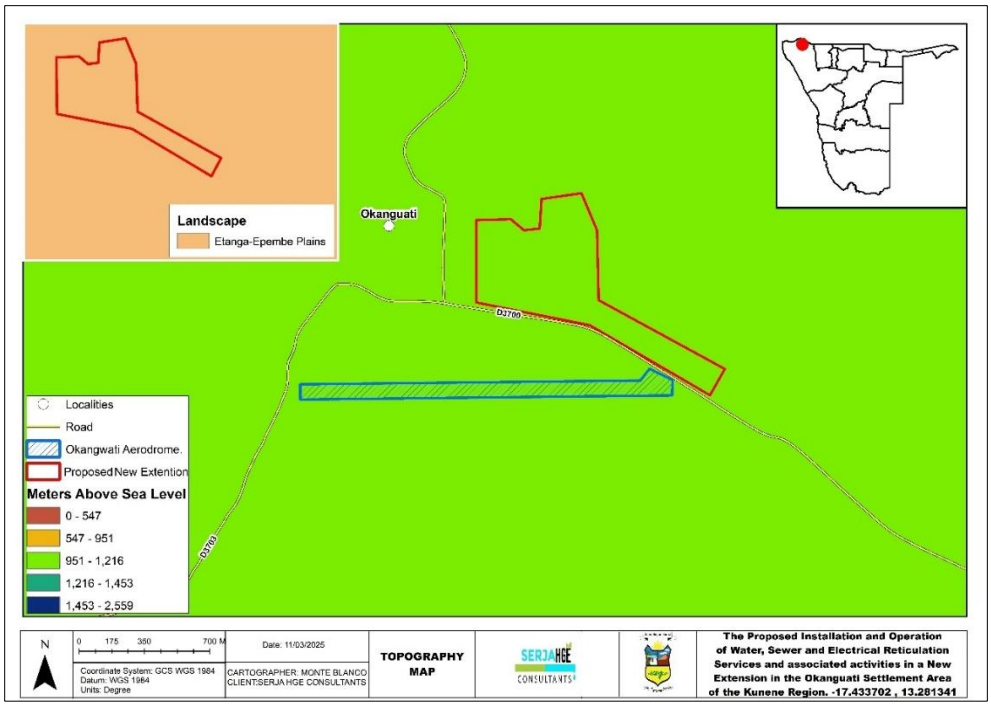


Figure 5-3: Topography and landscape of the area

5.2.3 Geology

The geology around the site indicates that the site mainly lies on rock units comprising paragneiss, metasedimentary rocks (orthogneiss), as shown on the geology map in Figure 5-4.

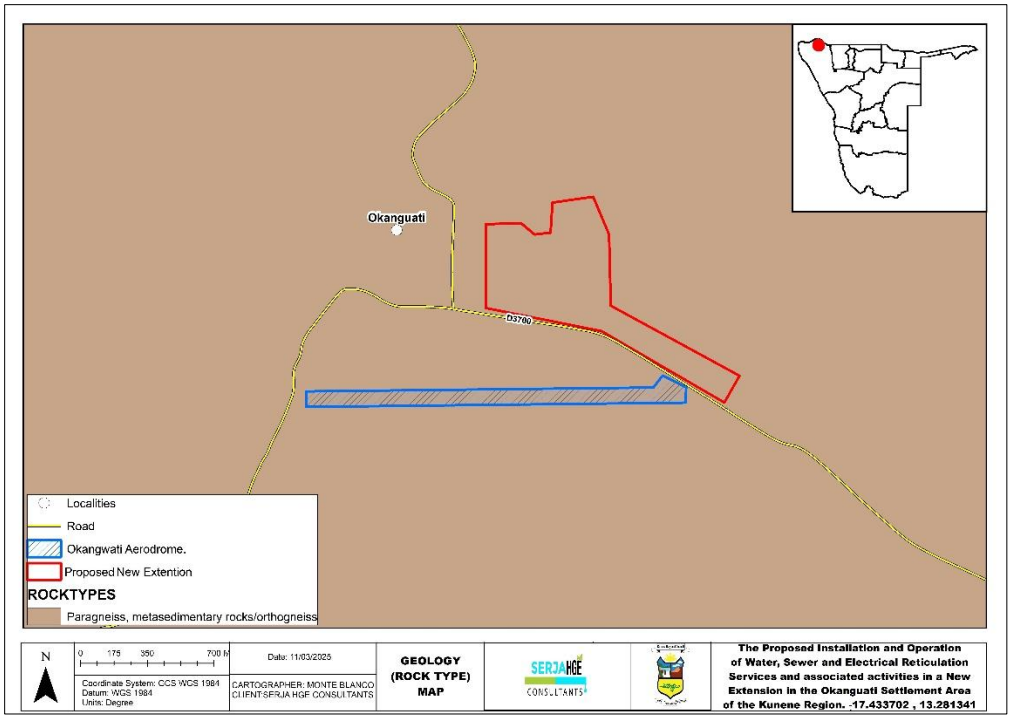


Figure 5-4: The geology of the project route area and surroundings

5.2.4 Soils

The dominant soil types in the project area, chromic cambisols, as shown on the soil map in Figure 5-5. According to Mendelsohn et al (2002), chromic soils are soils with bright colors, with their second name component (cambisols) defined as soils that were formed quite recently in geological time, mainly from medium and fine textured parent material deposited during sporadic flooding (Mendelsohn et al., 2002). Soils in and around the Okanguati area are shallow, and vegetation is sparse in this arid environment[2].

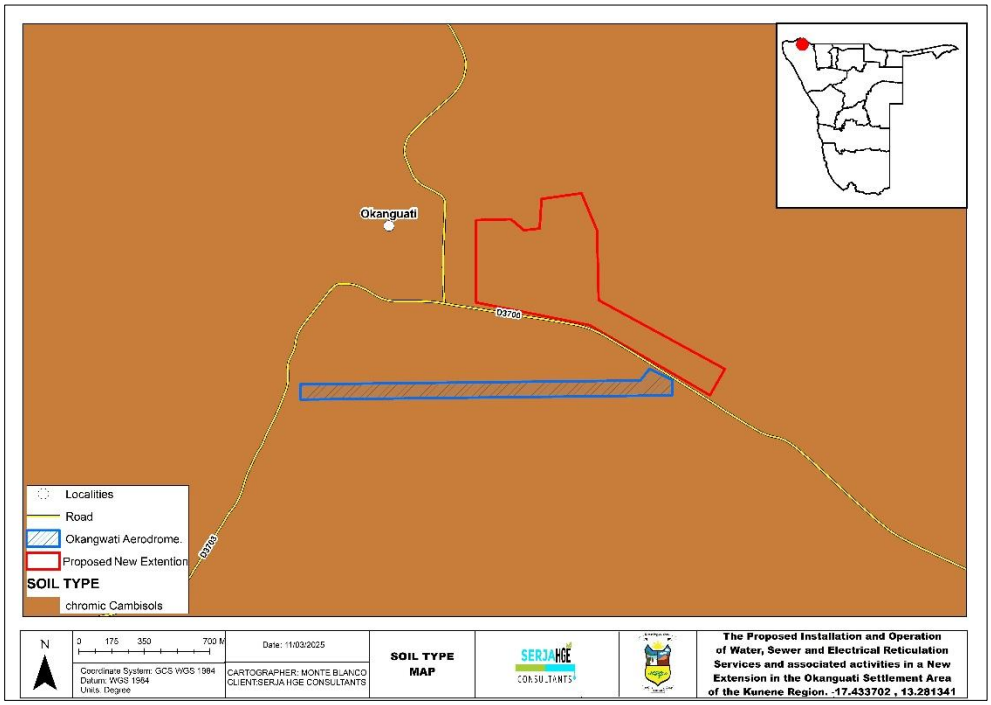


Figure 5-5: Dominant soil types on and near the project site

5.2.5 Water resources: groundwater (hydrogeology) and surface water (hydrology)

Groundwater in the project area is hosted either in confined aquifers or rock bodies with little groundwater potential. Lohe *et al* (2021) stated that recharge from rainfall is an important parameter determining the groundwater potential, but the degree of metamorphism affects the groundwater potential too. The groundwater potential of the rocks decreases as the degree of metamorphism increases.

In terms of local groundwater sources, there are eight boreholes near the site as shown on the map in Figure 5-6. These boreholes have yields ranging between 1.2m^3/hour (for Borehole 9586) and 12m^3/hour (for Borehole 31527). However, some of the boreholes in the database were drilled over 50 years ago, and therefore, some are no longer operational or do not have any complete records of drilling information, such as yields. The Okanguati Settlement is supplied by one borehole located about 12km from the Settlement,

[2] https://atlasofnamibia.online/chapter-1/landscapes

which is said to have good potential/yield to supply the Settlement. Thus, the yield is deemed sufficient for the Settlement water needs.

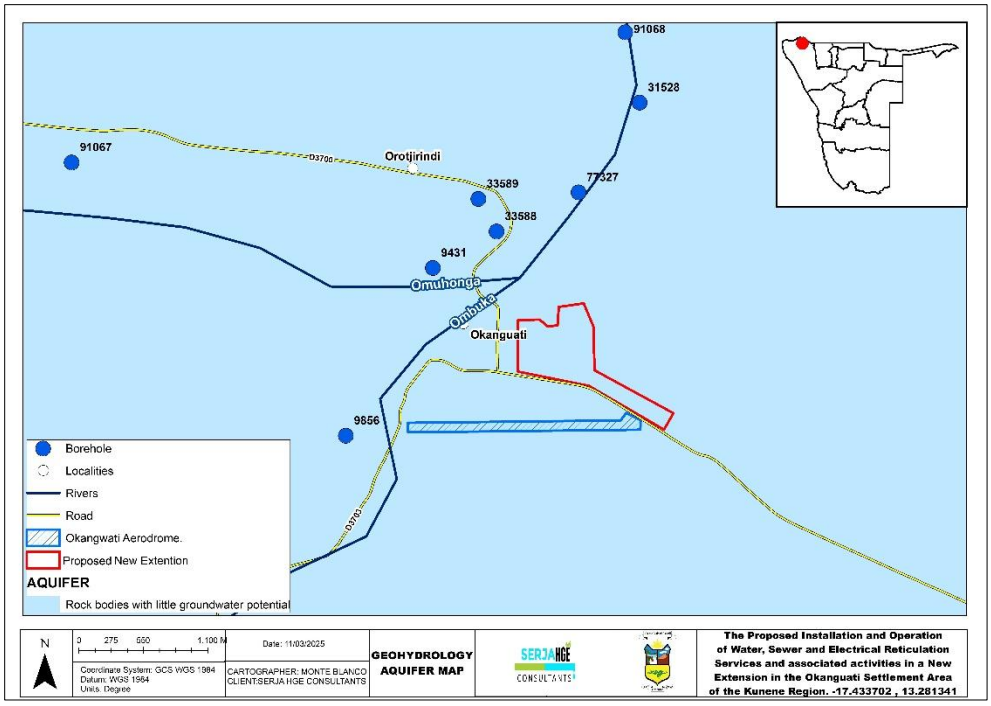


Figure 5-6: The surface and groundwater (geohydrology) map of the site area

In terms of surface water, there are two ephemeral rivers (Omuhonga and Ombuka rivers). Ombuka River runs through the Settlement on the western side of the New Extension site in a southwesterly-northeasterly trend, while Omuhonga River is on the northwestern side, as indicated on the map above.

5.2.6 Wind direction

The predominant wind direction in Okanguati is from the southwest to northeast (Meteoblue-modelled climate as shown in Figure 5-7). The wind speed chart shows that the wind blows all year round with a speed ranging between 10 and 20km/h for 5 to 20 days, as shown on the wind chart below.

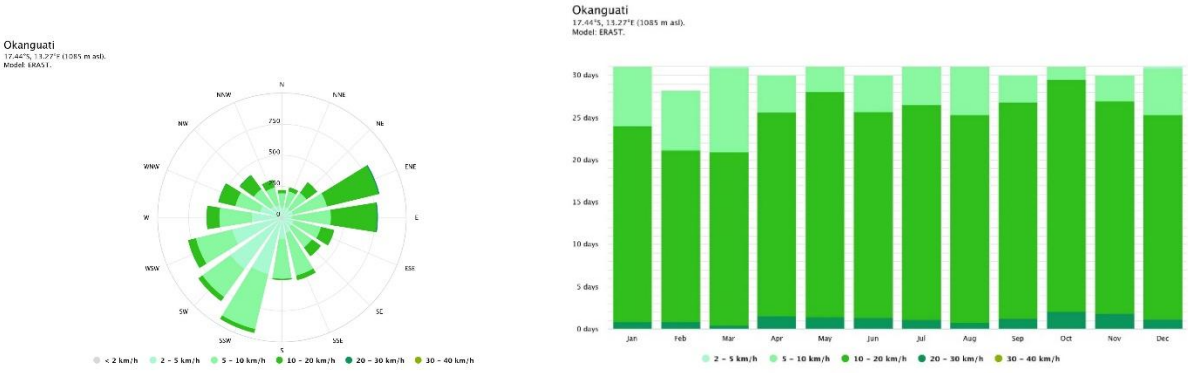


Figure 5-7: Wind rose and wind speed chart for Okanguati (Meteoblue, 2025)

5.3 Social and Economic Environment

5.3.1 Regional and Constituency Demography

According to the 2023 National Population and Housing Census, the Kunene Region has a population of 120,762 people (60,189 females and 60,573 males)[3]. Okanguati Settlement, which hosts the New Extension, falls within the Epupa Constituency, which has a total estimated population of 26,491 (12,436 males and 14,055 females). The population density of the Constituency is 1.1 persons per square kilometer (km^2).

5.3.2 Economic Activities

According to the Namibia Statistics Agency (2024), the main sources of income in the Kunene Region are wages & salaries (35%), old age pension (12.8%), business, non-farming (4.7%), and farming at 16.2%.

Livestock production is one of the key sources of livelihood for many rural households in the Kunene Region (Kunene Regional Council, 2015). The trading of animals during formal auctions creates a source of income for farmers (residents) residing in the Region. The exportation of animals from the Kunene Region to neighboring countries continues to boost the economy of the Region. In support of the industry, the Government established five Quarantine camps to improve the quality and health of animals marketed, namely, at Swartbooi Drift, Ehomba, Khowarib, Condor, Palmwag, Omutambo-owe, which is situated in Omusati Region but under the jurisdiction of Opuwo state veterinary office (Kunene Regional Council, 2015).

From a local perspective, the area mostly relies on livestock farming with goats, sheep, cattle, donkeys, and horses, tourism, and employment created by the government (offices) in Okanguati.

5.3.2.1 Current land use of the site

The area proposed for the New Extension is currently occupied by some informal houses on the side closer to the center of the Settlement, while the remaining area of the New Extension is virgin land covered by mopane trees and stinkbush shrubs.

5.3.3 Services Infrastructure

The Okanguati Settlement has some good infrastructure, such as a water supply scheme (borehole supplied and stored in a reservoir), an electricity grid, roads, and even an airstrip (Okanguati Aerodrome) as shown on the map in Figure 5-8. The solid waste in the Settlement is managed by storing it at a somewhat informal dumpsite located about 2.5km southeast of the proposed New Extension. Sewage is managed through existing sewer oxidation ponds, some of which look dilapidated.

[3] https://census.nsanamibia.com/kunene-region/

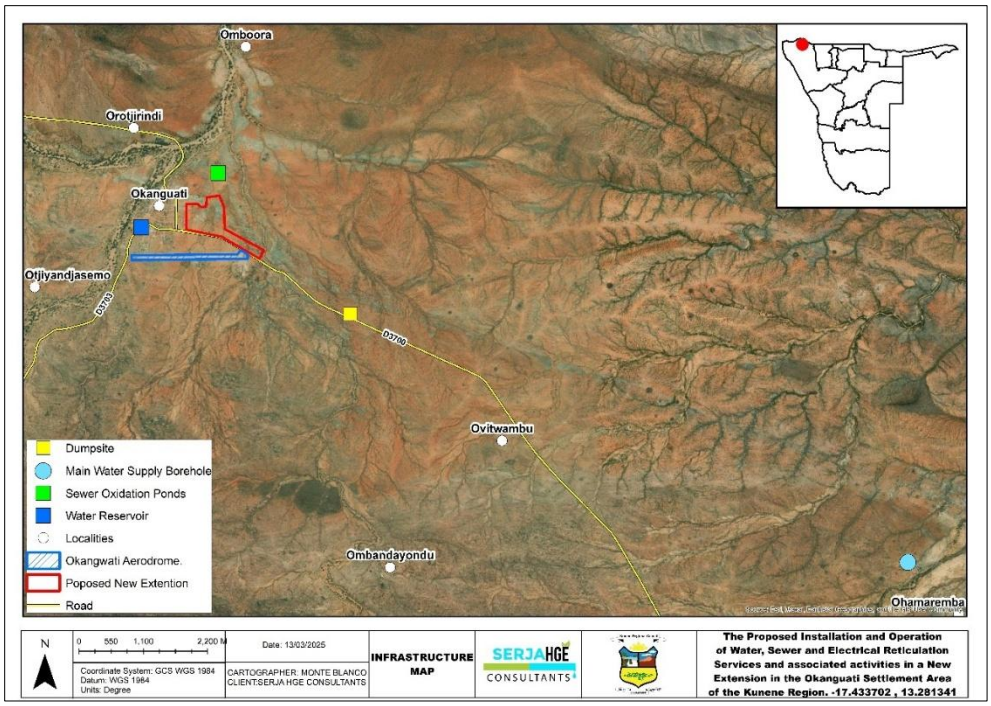
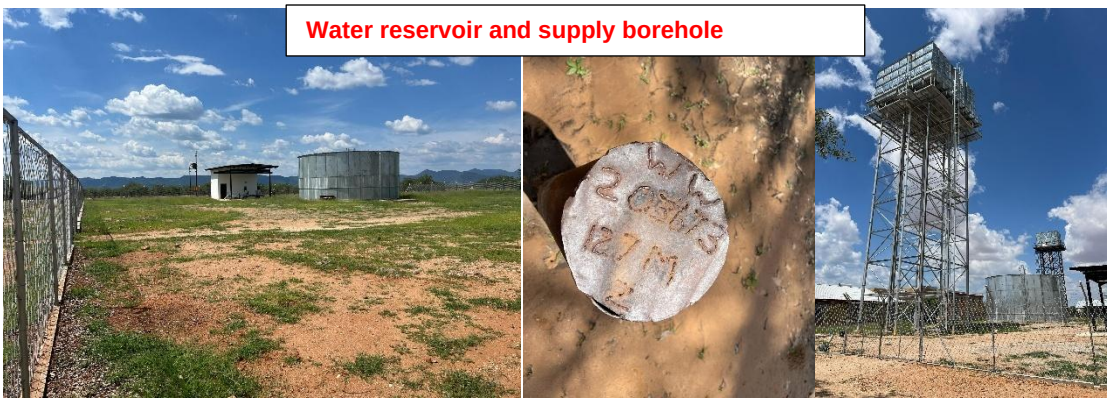


Figure 5-8: Infrastructure map of Okanguati Settlement

Some photos of the visited infrastructures in the Settlement are shown in Figure 5-9.



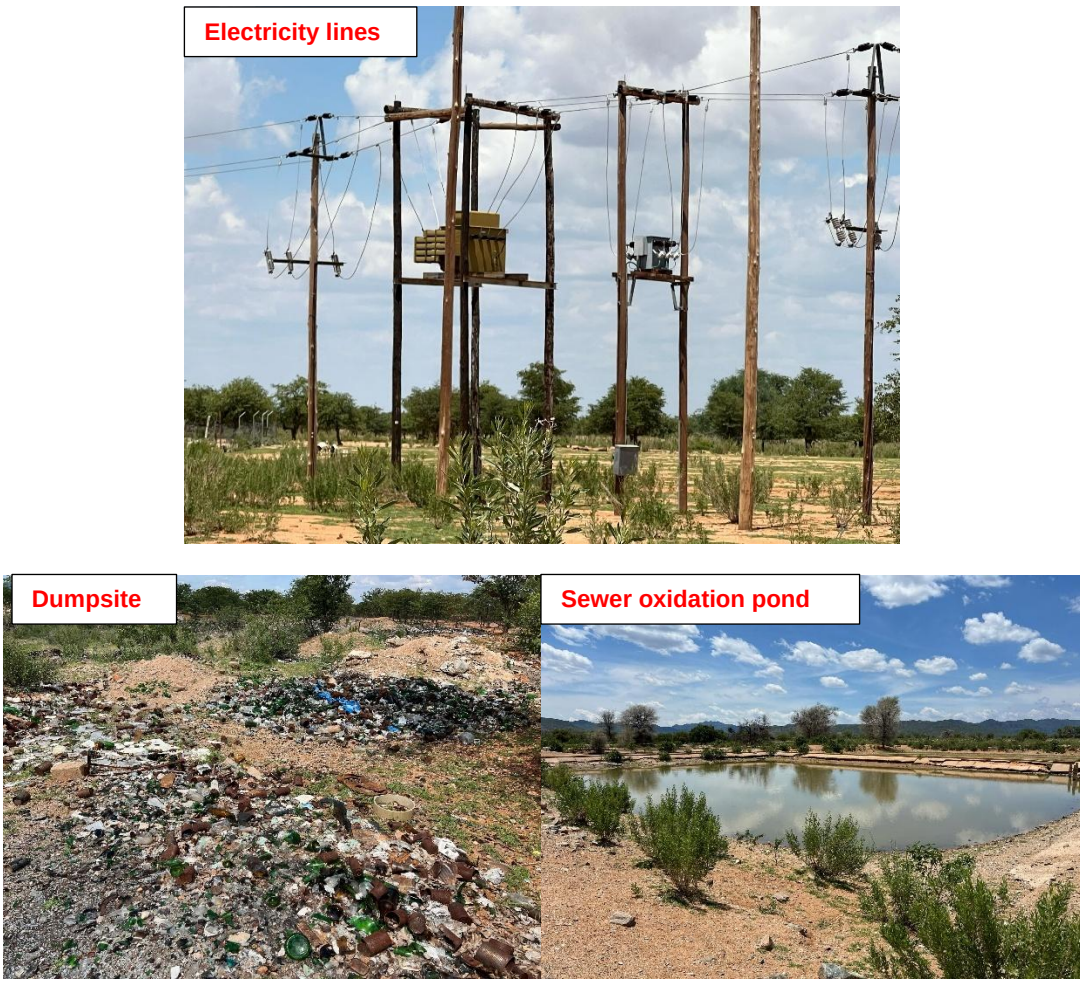


Figure 5-9: Some of the visited infrastructure in the Okanguati Settlement

The public consultation and engagement process and means employed for the EIA Study are presented in Chapter 6.

6 PUBLIC CONSULTATION AND PARTICIPATION PROCESS

Public consultation and participation form an important component of an EIA process. It provides potential Interested and Affected Parties (I&APs) and stakeholders with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. This greatly assists the EAP (Environmental Consultant) to thoroughly identify and record potential impacts and to what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. The consultation for this project has been done under the EMA and its EIA Regulations, and as per the following subsections.

6.1 Pre-identified and registered interested and affected parties (I&APs)

Relevant and applicable national, regional, and local authorities and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers were registered as I&APs upon their request.

6.2 Communication with I&APs and means of consultation employed

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process, and these have been used in guiding this process. Communication with I&APs with regards to the project was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration, and shared with registered stakeholders at the beginning of the EIA process.
- A Stakeholders (I&AP) List was developed (Appendix D) and updated throughout the EIA. The BID was shared with the pre-identified key stakeholders, such as the Kunene Regional Council, Epupa Constituency, Okanguati Settlement, and other stakeholders.
- The EIA notices were published in the *New Era* and *Windhoek Observer* newspapers on the 26th of February & 05th of March 2025 - Appendix E.
- EIA notices were prepared for printing (posters) that were pasted at the Kunene Regional Council in Opuwo and in Okanguati at the Epupa Constituency Office and Okanguati Settlement Office. Photos of the poster are shown in Figure 6-1, and the original copy of the notice is attached hereto as Appendix F.

Figure 6-1: EIA public notice posters in Opuwo and Okanguati Settlement

- A consultation meeting was scheduled and held with the stakeholders and the Okanguati community on the 11th of March 2025 at the Agricultural Hall - Figure 6-2. The meeting was attended by thirty-four (34) people, including one environmental assessment practitioner from Serja HGE Consultants. Minutes were taken from the meeting, and these are attached hereto as Appendix G.

Figure 6-2: Consultation meeting at the Agricultural Hall in Okanguati Settlement on 11 March 2025

6.3 Feedback and issues raised by stakeholders and (I&APs)

There were no significant issues raised in the consultation meeting, as the stakeholders and I&APs were in full support of the project and would like to see it implemented for the benefit of the community. The following key comments were made and summarized as follows:

- How water will be purified should be clarified, as well as the management of solid waste in the Settlement during the installation of these services, and eventually the operation of the New Extension.
- Suggestion to have water supply via a pre-paid manner, like what is done in Otjiwarongo. This is to avoid the piling of water bills among the residents and businesses.

The consultation period ran from the 26th of February 2025 to the 28th of March 2025 to allow sufficient time for the submission of comments.

6.3.1 Concluding Remark on the Overall EIA Consultation Process and Feedback

Minor comments that were raised during the consultation period were not significant enough to object to the proposed project. Stakeholders and I&APs would just like to see the project implemented.

The next chapter (Chapter 7) is the presentation of the potential impacts identified, the impact assessment methodology, the description of impacts, and their assessment.

7 IMPACTS IDENTIFICATION, ASSESSMENT, AND MEASURES

7.1 Identification of Potential Impacts

The proposed project activities are usually associated with potential positive and negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts that are likely to affect the host's environmental and social features. The assessment is done to ensure that these impacts are sufficiently addressed, and adequate mitigation measures are recommended thereto for implementation so that the impact's significance is brought under control while maximizing the positive impacts. Potential positive and negative impacts that have been identified from the project activities are listed as follows:

7.1.1 Positive impacts (benefits)

- Socio-economic development through job (employment) creation and skills development, as well as procurement of local services and goods.
- Access to reliable, clean water improves the quality of life by providing safe drinking water for residents and businesses. This reduces the time and labor spent on collecting water from far areas in the Settlement.
- Clean and potable water is essential for sanitation and hygiene in the Settlement, preventing outbreaks of diseases like cholera.
- Provision of a proper sewage system can help prevent contamination of local surface water and groundwater sources by ensuring that untreated sewage is not being discharged into the environment. This reduces the risk of waterborne diseases and improves overall community and environmental health in Okanguati Settlement and surrounding areas.
- The availability of essential services (such as water and sewer) has a great potential to attract residents and investors into the Settlement. Thus, making the Settlement appealing to both current and potential residents and investors, leading to increased property values and the growth of local businesses.
- Electrical reticulation ensures a reliable supply of electricity to the New Extension as it is needed for lighting, heating, cooking, and operating appliances. It is essential for modern living and business activities. A proper electrical network ensures that the power supply is safely distributed across the building or development, preventing overloads or hazards such as electrical fires. Added to that, an electrical reticulation system is crucial in supporting technology and infrastructure, as many modern houses and businesses rely on electrical power for technology, internet connectivity, and heating/cooling systems. Therefore, proper electrical infrastructure ensures the smooth operation of these services.

7.1.2 Potential environmental and social negative (adverse) impacts

- Physical land (soil) disturbance and soil erosion during construction.
- Impact on biodiversity (fauna and flora) and habitat destruction.
- Potential soil and groundwater pollution from waste products during construction and operations (in case of sewer pipeline breakages).
- Potential over-abstraction of water resources owing to the required additional volumes to supply the New Extension may result in the depletion of water resources, which may affect local ecosystems.
- General environmental pollution (littering) through mishandling of project-related waste.
- Poorly managed construction waste can contaminate nearby land and waterways, affecting both the local ecosystem and human health.
- Air pollution by potential dust from machinery and excavations during construction.
- Noise associated with the movement of heavy machinery and trucks in the Settlement.
- Occupational and community health and safety: Improper handling of materials and equipment may cause health and safety risks to workers and locals.
- Impact on archaeological and heritage resources through inadvertent unearthing of such resources during earthworks.

In terms of specific negative impacts or risks associated with electrical reticulation installation, these are as follows:

- Risks of electrical shocks are associated with poor installation or incorrect wiring, which can be dangerous for both professionals working on the system and locals or occupants of the New Extension later on.
- Fire Hazards associated with faulty wiring or overloading circuits could potentially lead to electrical fires. Inadequate grounding, incorrect installation of cables, or damaged wires can increase the risk.
- The impact of increased energy consumption owing to the inefficient design of the reticulation system. This could result in increased energy usage, leading to higher electricity bills. Overloading circuits or installing outdated systems can also cause inefficiencies.

The impacts are briefly described and assessed under the next subheadings. The management and mitigation measures are provided in the EMP for implementation.

7.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is following Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity), and probability (likelihood of occurring), as presented in Table 7-1.

To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact,
- Assessment of the pre-mitigation significance of the impact, and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria (in Table 7-1) were applied in this impact assessment:

Table 7-1: Criteria used for impact assessment (extent, duration, intensity, and probability)

The Criteria used to assess the potential negative impacts.				
The extent or spatial scale) The extent is an indication of the physical and spatial scale of the impact.				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
The impact is localized within the site boundary: Site only	The impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond the site boundary: Regional	The impact extends beyond National or international boundaries
Duration- Duration refers to the timeframe over which the impact is expected to occur, measured concerning the lifetime of the project				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**

The Criteria used to assess the potential negative impacts.				
Immediate mitigating measures, immediate progress	The impact is quickly reversible, and short-term impacts (0-5 years)	Reversible over time; medium-term (5-15 years)	Impact is long-term	Long-term, beyond closure, permanent, irreplaceable, or irretrievable commitment of resources
Intensity, Magnitude/severity - Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. This is a qualitative type of criterion.				
H-(10)	**M/H-(8)**	**M-(6)**	**M/L-(4)**	**L-(2)**
Very high deterioration, high quantity of deaths, injury or illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat/diversity or resource, severe alteration, or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat/biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species/habitat/diversity or resource, no or very little quality deterioration.
Probability of occurrence - Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment.				
Low (1)	**Medium/Low (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.3 Impact Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

Once the above factors (Table 7-1) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SP = (magnitude + duration + scale) x probability

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate, or low significance, based on the following significance rating scale (Table 7-2).

Table 7-2: Impact significance rating scale

Significance	Environmental Significance Points	Color Code
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	>-60	H

For an impact with a significance rating of high, mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the project phases is done for both pre-mitigation (before implementing any mitigation) and post-mitigation (after mitigations are implemented). The objective of the mitigation measures is to first avoid the risk, and if the risk cannot be avoided, the mitigation measures to minimize the impact are recommended. Once the mitigation measures have been applied, the identified risk will be of low significance.

7.4 Description and Assessment of Potential Impacts

The potential impacts of the project activities are described and assessed in Table 7-3. The management and mitigation measures in the form of management action plans are provided in the EMP.

Table 7-3: Description and Assessment of the impacts of the proposed project activities on the biophysical and social environment

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
POSITIVE IMPACTS											
Employment creation and skills development (training)	Socio-economic development through job temporary (employment) and skills development (training) as well as procurement of local services and goods, which will promote local economic development through income generation.	L / M- 2	L / M - 2	L / M - 4	L / M - 2	L - 16	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44
Access to reliable, potable, and clean water	This improves the quality of life by providing safe drinking water for residents and businesses. This reduces the time and labor spent on collecting water from far areas in the Settlement. Clean and potable water is essential for sanitation and hygiene in the Settlement, preventing outbreaks of diseases like cholera.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M - 3	M / H - 4	L / M - 4	M / H - 4	H - 75
Electrical reticulation ensures a reliable supply of electricity to the New Extension.	Electricity is needed for lighting, heating, cooking, and operating appliances. It is essential for modern living and business activities. A proper electrical network ensures that the power supply is safely distributed across the building or development, preventing	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M - 3	M / H - 4	L / M - 4	M / H - 4	H - 75

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	overloads or hazards such as electrical fires. Moreover, electrical reticulation systems are crucial in supporting technology and infrastructure, as many modern houses and businesses rely on electrical power for technology, internet connectivity, and heating/cooling systems. Therefore, proper electrical infrastructure ensures the smooth operation of these services.										
NEGATIVE (ADVERSE) IMPACTS											
Physical disturbance to the site soils resulting in erosion	The removal of soil and vegetation onsite to allow construction work can increase the risk of soil erosion. The erosion can result in sedimentation of nearby water bodies and habitat degradation. Furthermore, the movement of heavy vehicles and equipment off-road may lead to soil compaction. This will, however, be a short-term and localized impact.	M - 3	M / H - 4	L / M - 4	M / H - 4	M – 44	L / M - 2	L / M - 2	L / M - 4	L / M - 2	L - 16
Impact on faunal and	The clearing of vegetation on-site to set up project equipment	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
flora biodiversity: Disturbance of local fauna and flora during construction.	and services would destroy the vegetation. However, the site is partially occupied by informal houses and partially covered by some vegetation. Regardless, the impact will be localized, site-specific, and therefore manageable.										
Potential soil and groundwater pollution from waste products during construction and operations	Potential soil and groundwater pollution from waste products during construction and operations (in case of sewer pipeline breakages). The project activities will be associated with a variety of potential pollution sources (i.e., lubricants, fuel, and wastewater) that may contaminate surrounding soils and eventually surface and groundwater. Surface water pollution would occur through the run-off of polluted water to nearby surface water bodies, such as ephemeral rivers, during rainy seasons. Groundwater pollution occurs through the leaching of liquid wastes from the surface into the groundwater systems.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	Pollution of groundwater could negatively affect downstream areas where abstraction from the local aquifer may occur. It should be noted that the scale and extent of the activities where potential pollution may occur will be small and much localized.										
Over-utilization of water resources	Potential over-abstraction of water resources owing to the required additional volumes to supply the New Extension may result in the depletion of water resources, which may affect local ecosystems. The required water volumes will be sourced from the Settlement scheme. The amount of water required for construction purposes is relatively small compared to standard development construction works. During the operational phase, a maximum daily supply of the New Extension. Therefore, given the anticipated small volumes of water required for the construction phase and the duration of water use, the impact on groundwater will be minimal.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
General environmental pollution (littering) through the mishandling of project-related waste	Waste types such as solid, wastewater, and hazardous (waste fuels and oils) will be produced during construction. Improper handling, storage, and disposal of wastes may lead to environmental degradation/pollution. If solid waste such as paper and plastics, and PVC wiring, is not properly stored or just thrown into the environment (littering), these may be consumed by livestock and wildlife in the area, and this could be detrimental to their health.	M - 3	M / H - 4	L / M - 4	M / H - 4	M – 44	L / M - 2	L / M - 2	L / M - 4	L / M - 2	L - 16
Impact on flora biodiversity: Disturbance of local fauna and flora during construction.	The clearing of vegetation on-site to set up project equipment and services would destroy the vegetation. The site is strategically at an area with minimal vegetation where no further or significant vegetation removal is required. Hence, the impact will be localized, site-specific, and therefore manageable.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Air Quality: Dust Generation	There is a potential impact of dust emanating from construction heavy vehicles	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	traveling on the unpaved roads when transporting materials from and to the site, as well as excavation works to install services. This may contribute to the dust level and compromise air quality in the area. The impact is considered short-term and localized as construction activities are carried out over a specified duration. Given the scale and nature of the construction, the impact on the air quality is expected to be very limited in extent and duration, and therefore negligible.										
Noise	Noise associated with the movement of heavy machinery and trucks can disturb locals and animals (livestock and wildlife). Excessive noise without any protective measures in place can also be a health risk to workers on-site. The activities are considered small to medium scale, and the noise level is bound to be limited to the site. Thus, the impact likelihood is minimal.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Illegal hunting of wildlife, particularly during the construction phase	Construction workers may poach local wildlife or valuable plants in the area, or may facilitate such illegal activities by other parties. This may result in a potential loss of valuable wildlife and plants in the area that contribute to tourism activities around Okanguati. If not managed effectively, the potential poaching of wildlife by the construction workers would negatively affect the local biodiversity.		M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Occupational health and safety risks	The mishandling of machinery and equipment by project workers onsite during the installation of water, sewer, and electrical reticulation components may result in injuries, especially if there is insufficient training and induction, or poor to no appropriate personal protective equipment (PPE) while working onsite.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Community health and safety risks	The curiosity of local children may force them to go and play with heavy trucks and big machinery onsite if left	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	unattended or unsecured. If construction trenches and holes are not backfilled or secured, people and animals may fall into them, resulting in injuries or worse. These could compromise the safety and health of the overall community.										
Accidental fire outbreaks	The use of heavy equipment, especially if there is a presence of hydrocarbons on-site, may result in accidental fire outbreaks. This could pose a safety risk to the project personnel (workers) and locals.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Vehicular traffic safety	The local access roads are the main transportation routes for all vehicular movement in the area from the C43. There would be a potential increase in traffic flow in the Settlement owing to the transportation of construction materials to the site. Not only materials transport, but also the delivery of supplies, goods, and services to the working sites. Depending on the project needs, trucks, medium, and small vehicles will be frequenting the site area. This would potentially	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	increase slow-moving heavy vehicular traffic along these roads, which could result in road accidents.										
Impact on local road use	The movement of heavy trucks on the community roads (single-track sandy routes) would result in the deterioration of these roads. However, this will be short-term and hence, manageable.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	M / L - 4	M / L -2	L - 12
Archaeological or cultural heritage impact	The excavation in the Settlement to install the water and sewer reticulation services (where trenches are required) may impact local cultural heritage resources. This could entail inadvertent unearthing of unknown and unmarked graves in the Settlement (within the services route/path), if any.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Electrical shock-installation of electrical reticulation system (services)	Risks of electrical shocks are associated with poor installation or incorrect wiring, which can be dangerous for both professionals working on the system and locals or occupants of the New Extension later on.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Fire Hazards - installation of electrical reticulation system (services)	Fire Hazards associated with faulty wiring or overloading circuits could potentially lead to electrical fires. Inadequate grounding, incorrect installation of cables, or damaged wires can increase the risk.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
The risk of increased energy consumption - installation of electrical reticulation system (services)	There is an increased risk of high energy consumption owing to the inefficient design of the reticulation system. This could result in increased energy usage, leading to higher electricity bills. Overloading circuits or installing outdated systems can also cause inefficiencies.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

7.5 Cumulative impacts associated with the installation of sewer reticulation service (system)

According to the International Finance Corporation (2013), cumulative impacts are defined as “those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as “developments”) when added to other existing, planned, and/or reasonably anticipated future ones”. The main cumulative impact that the project and associated activities potentially contribute to is:

- **Impact on water quality (water resources contamination from existing oxidation ponds):** the Okanguati Settlement has oxidation ponds that were established some time ago and seem to be dilapidated - Figure 7-1. These ponds are not lined, which means there is direct contact between the sewage in the pond and groundwater, which could mean there is ongoing groundwater contamination from seepage of sewage into the ground. Furthermore, the extra pressure from the proposed installation of sewage at the New Extension would mean more

sewage will be pumped into the ponds in the future, which might exceed the capacity of the current ponds in their current state. This might result in the overflowing of sewage into the general environment (surface water during the rainy season and eventually groundwater).

Figure 7-1: The current status of the Okanguati Settlement oxidation ponds

- Recommendation: The oxidation ponds need to be considered for upgrading by demolishing the existing facilities and establishing new, modern sewer oxidation ponds that are lined to protect water resources from contamination.

- **Community health and safety (sewer oxidation ponds)**: The Settlement's oxidation ponds were unfenced (Figure 7-2), but it is said that some community members try to gain access to the facilities by cutting the razor diamond wire. This compromises the safety of residents, especially children who might have access to the ponds and swim, potentially resulting in drowning accidents.

Figure 7-2: The oxidation ponds with a fallen razor diamond wire fencing and some ponds without fencing

- Recommendation: Okanguati Settlement through the KRC should regularly maintain the fence and hold regular campaigns on community education and awareness on the importance of keeping the oxidation ponds fenced off (for their safety and to have a sense of property ownership in their Settlement). The issue of cutting mesh wire and razor diamond wire by some community members in local authorities has been proven a common challenge at many waste management facilities (dumpsites and oxidation ponds) for local authorities in Namibia. Community members tend to cut through these fences for different reasons (gaining access to the ponds for ''swimming'' and watering their livestock).

The recommendations and conclusions made for the EIA Study are presented in the next chapter.

8 RECOMMENDATIONS AND CONCLUSIONS

The EIA Study for the proposed installation of the water, sewer, and electrical reticulation services was done following the EMA No. 7 of 2007 and its 2012 EIA Regulations, and all the due processes were followed.

Some key potential positive and negative impacts were identified, addressed, and incorporated into this Report. Mitigation measures have been provided in the Environmental Management & Plan (EMP) for implementation to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described and assessed. The potential negative impacts indicated a medium to low rating of significance. To minimize the significance, appropriate management and mitigation measures have been recommended thereof for implementation by the Proponent, their contractors, and workers to avoid and/or minimize their significance on the environment. The effective implementation of these measures, accompanied by monitoring, will particularly see a reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low or low to negligible).

8.1 Recommendations

The EIA Study was deemed sufficient and concluded that no further detailed assessments are required for the ECC application for the proposed project.

Serja Consultants are therefore confident that the potential negative impacts associated with the project activities can be managed and mitigated by effectively implementing the recommended management and mitigation measures, and with more effort and commitment put into monitoring the implementation of measures. It is, therefore, recommended that the project be granted an ECC, provided that:

- All management and mitigation measures provided are effectively and progressively implemented.
- All required permits, licenses, and approvals for the activities are obtained as required. These include permits and licenses, and ensuring compliance with these specific legal requirements.
- Transparency in communication and continued engagement with stakeholders and communities, or through their leaders, should be maintained throughout the project cycle.
- The Proponent, their project workers, and contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by issuing authorities.
- Disturbed site areas during construction should be rehabilitated as far as practicable. This includes the leveling of stockpiled topsoil, backfilling trenches, and project-associated holes.
- The EMP implementation should be checked and done by the responsible team member onsite (Environmental Control Officer / Safety Officer), and audited by an Independent Environmental

Consultant on a bi-annual basis to compile Environmental Monitoring (audit) reports. These reports are to be submitted to the Environmental Commissioner at the DEAF. This will be required by the Environmental Commissioner (as part of the ECC conditions).

- From the cumulative impacts' perspective, the following should be considered in the long run:
    - Water resources contamination: oxidation ponds need to be considered for upgrading by demolishing the existing facilities and establishing new modern sewer oxidation ponds that are lined to protect water resources from contamination.
    - Community health and safety (sewer oxidation ponds): Okanguati Settlement through the KRC should regularly maintain the fence and hold regular campaigns for community education and awareness on the importance of keeping the oxidation ponds fenced off (for their safety and to have a sense of property ownership in their Settlement). The issue of cutting mesh wire and razor diamond wire by some community members in local authorities has been proven a common challenge at many waste management facilities (dumpsites and oxidation ponds) for local authorities in Namibia. Community members tend to cut through these fences for different reasons (gaining access to the ponds for ''swimming'' and watering their livestock).

8.2 Recommendations and Conclusions

In conclusion, although significant, the identified impacts would not hinder the project activities. However, the recommended measures should be effectively implemented and monitored to ensure that the significance of adverse impacts is reduced to a low where it is medium, and eventually to a negligible significance rating. The effectiveness of the implementation of the management and mitigation measures and EMP compliance will be done by an Environmental Control Officer (ECO) or Safety Officer (SHE Officer) and audited by an Independent Environmental Consultant on a bi-annual basis. This is to ensure that EMP implementation can be tracked via Bi-Annual Environmental Monitoring exercises and documented in the monitoring reports to the Environmental Commissioner. The monitoring of EMP implementation will not only be done to ensure that the impact's significance is reduced and or maintain a low significance rating, but also to ensure that all potential unforeseen impacts that might arise during implementation are properly identified in time and addressed immediately.

9 LIST OF REFERENCES

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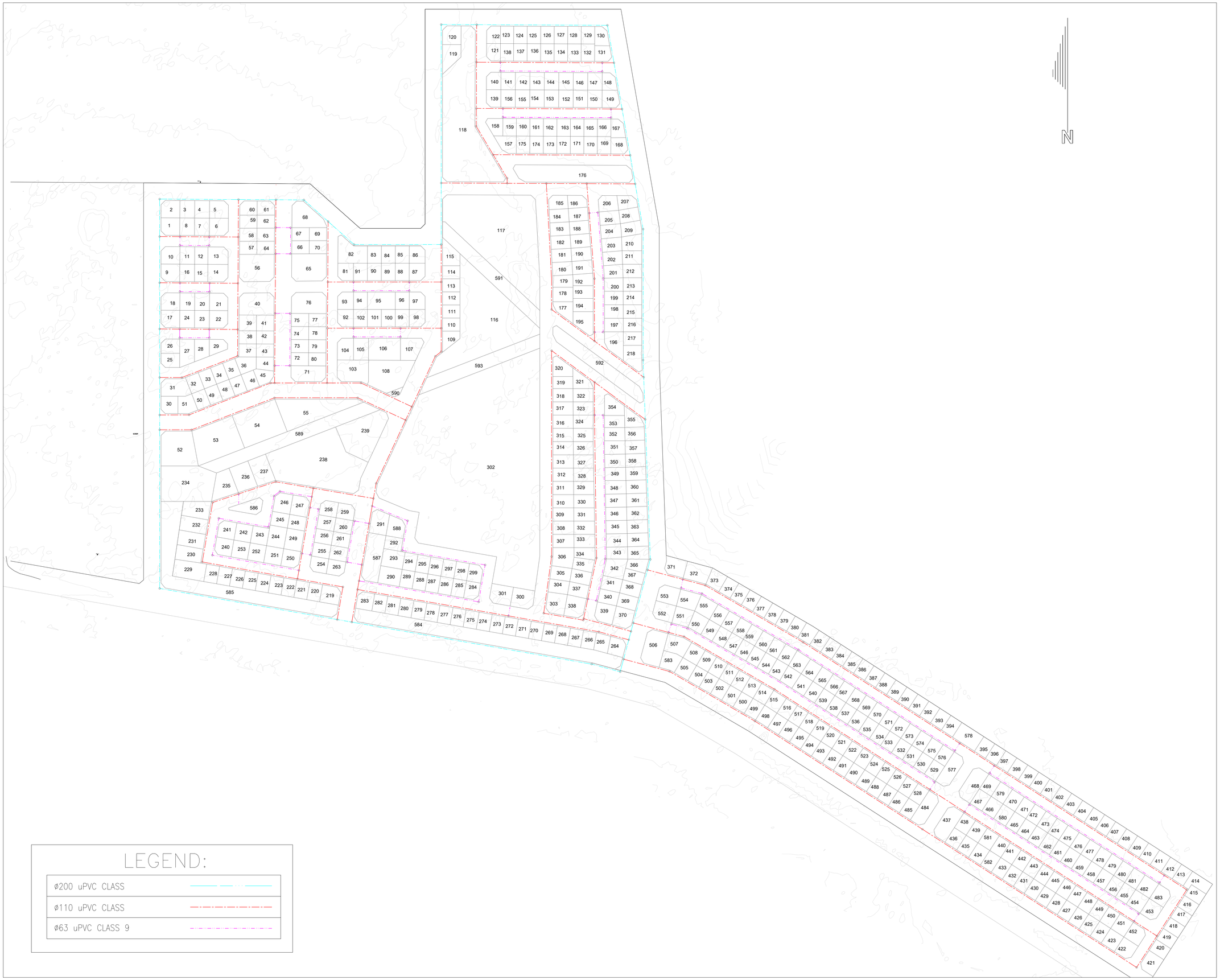
APPENDIX A: DRAFT ENVIRONMENTAL MANAGEMENT PLAN (EMP)

APPENDIX C: AVAILABLE PRELIMINARY DRAFT DRAWINGS OF THE PROPOSED SERVICES (WATER AND SEWER RETICULATION NETWORKS) OF THE NEW EXTENSION IN OKANGUATI SETTLEMENT



NOTES:

1. NO PART OF THIS DRAWING MAY BE SCALED.
2. ALL DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

PRELIMINARY DRAFT

FOR INFORMATION

REV	DESCRIPTION	BY	DATE

ENGINEER:

AROVAR

Mobile : +264 81 474 3893
E-Mail: avovar@iway.na
Fax : 088 655 2973
Box : PO Box 29043, Mail Centre, Windhoek
Address : 35 Blackthorn Square, Elisenheim

CLIENT:

Kunene Regional Council
Private Bag 502
Opuwo
Namibia

DRAWN:	CHECKED:	DATE:	REVISION:

PROJECT NAME: SERVICES FOR NEW EXTENSION OKANGUATI SETTLEMENT AREA

DRAWING TITLE: WATER RETICULATION NETWORK LAYOUT

SCALE:	SHEET SIZE:	SHEET NO:
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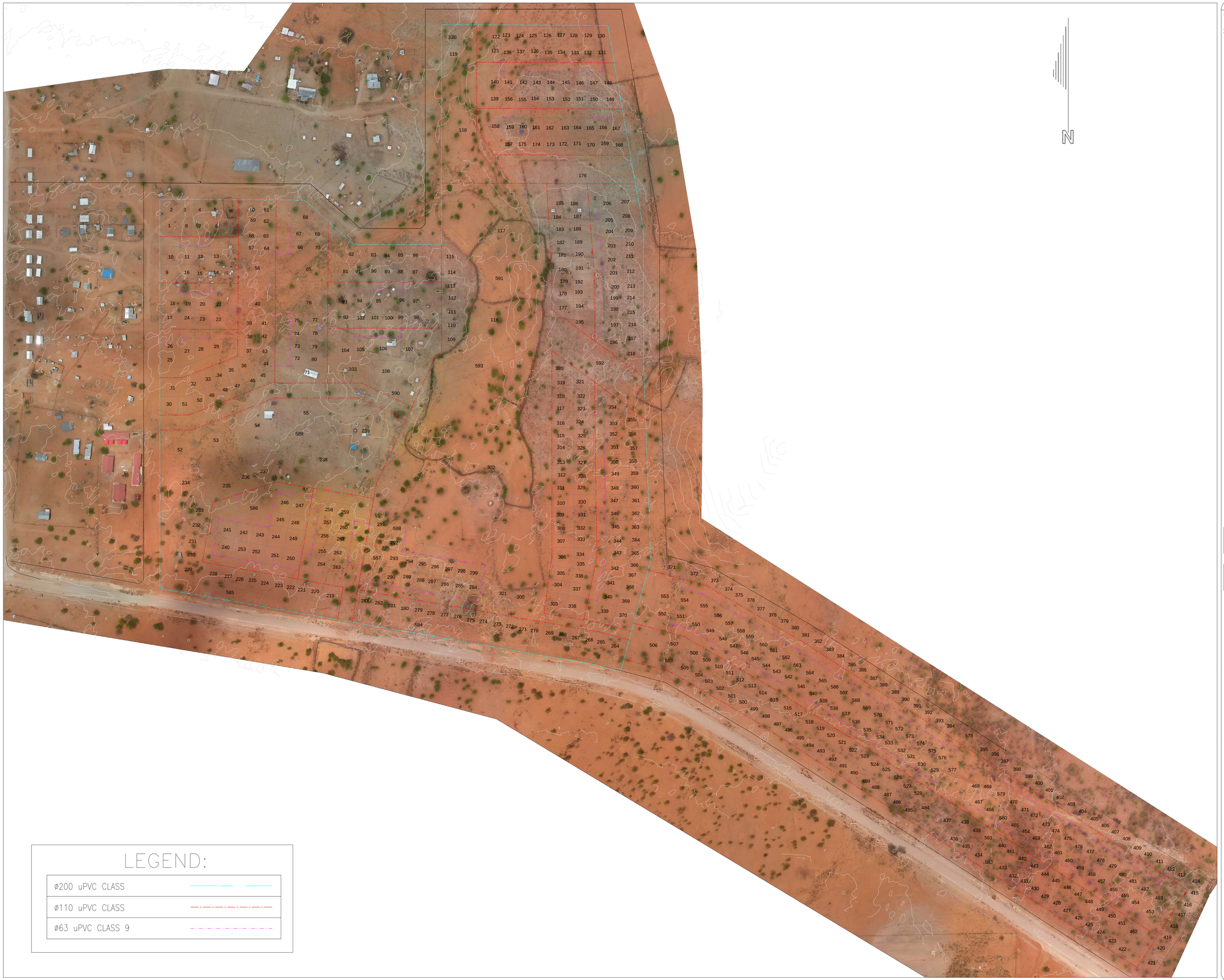
PROJECT NO:	STATUS:
	FOR CONSTRUCTION

DRAWING NO: P250100-CW-00



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ø63 uPVC CLASS 9	

NOTES:

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PRELIMINARY DRAFT

FOR INFORMATION

REV	DESCRIPTION	BY	DATE

ENGINEER:

AROVAR CONSULTING ENGINEERS (PTY) LTD

Mobile : +264 81 474 3893
E-Mail: avovar@iway.na
Fax : 088 655 2973
Box : PO Box 29043, Mail Centre, Windhoek
Address : 35 Blackthorn Square, Elisenheim

CLIENT:

Kunene Regional Council
Private Bag 502
Opuwo
Namibia

DRAWN:	CHECKED:	DATE:	REVISION:

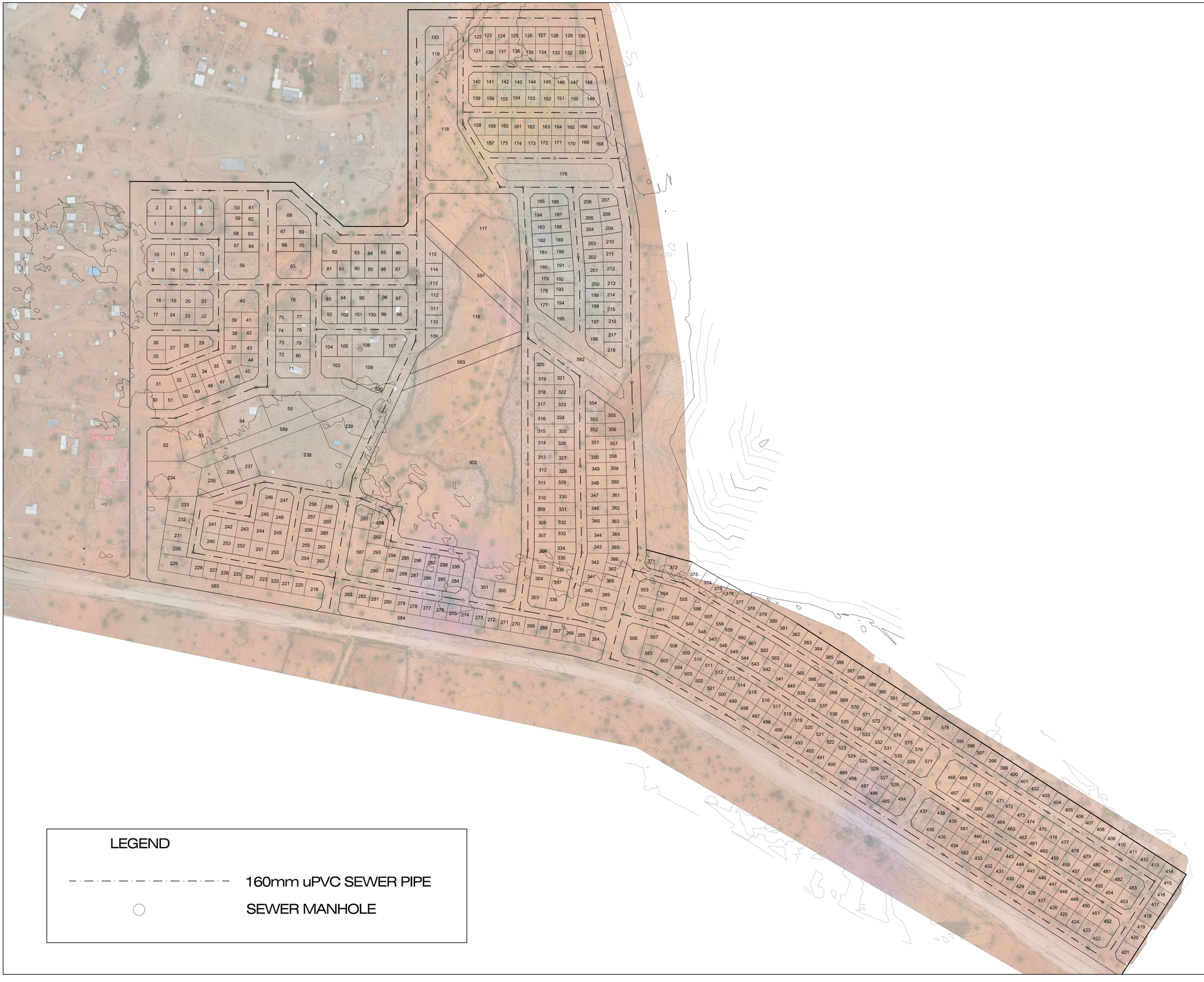
PROJECT NAME: SERVICES FOR NEW EXTENSION OKANGUATI SETTLEMENT AREA

DRAWING TITLE: WATER RETICULATION NETWORK LAYOUT

SCALE:	SHEET SIZE:	SHEET NO:
1:2000	A1	

PROJECT NO:	STATUS:
	FOR CONSTRUCTION

DRAWING NO: P250100-CW-00



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PRELIMINARY DRAFT

FOR INFORMATION

REV	DESCRIPTION	BY	DATE

ENGINEER:

AROVAR PROJECT ENGINEERS

Mobile : +264 81 474 3893
E-Mail: avovar@iway.na
Fax : 088 655 2973
Box : PO Box 29043, Mail Centre, Windhoek
Address : 35 Blackthorn Square, Elisenheim

CLIENT:

Kunene Regional Council
Private Bag 502
Opuwo
Namibia

DRAWN:	CHECKED:	DATE:	REVISION:

PROJECT NAME: SERVICES FOR NEW EXTENSION OKANGUATI SETTLEMENT AREA

DRAWING TITLE: SEWER RETICULATION NETWORK LAYOUT - LOCALITY VIEW

SCALE:	SHEET SIZE:	SHEET NO:
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PROJECT NO:	STATUS:
	FOR INFORMATION

DRAWING NO: P250100-CK-01

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FOR INFORMATION

REV	DESCRIPTION	BY	DATE

ENGINEER:
AROVAR PROJECT ENGINEERS
Mobile : +264 81 474 3893
E-Mail: avovar@iway.na
Fax : 088 655 2973
Box : PO Box 29043, Mail Centre, Windhoek
Address : 35 Blackthorn Square, Elisenheim

CLIENT:
Kunene Regional Council
Private Bag 502
Opuwo
Namibia

DRAWN:	CHECKED:	DATE:	REVISION:

PROJECT NAME: SERVICES FOR NEW EXTENSION OKANGUATI SETTLEMENT AREA

DRAWING TITLE: SEWER RETICULATION NETWORK LAYOUT - NETWORK VIEW

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PROJECT NO:	STATUS:
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DRAWING NO: P250100-CK-02