ZUTARI NDODANA

JOINT VENTURE

Olifants Management Model Programme Bulk Raw Water Study Phase (OMMP-BRWSP)

DRAFT BASIC ASSESSMENT REPORT (BAR): SEKURUWE WATER TREATMENT WORKS (WTW)

Submission to:

THE LIMPOPO DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENT AND TOURISM

Submission date : 2023/10/03
Revision : Rev-B – For Public Comments

LIST OF ABBREVIATIONS

AIA	Aquatic Impact Assessment
AQIM	Air Quality Impact Assessment
AIP	Alien and Invasive Plant
BA	Basic Assessment
BAR	Basic Assessment Report
BOQ	Bill of Quantities
BPDM	Bojanala Platinum District Municipality
CAA	Civil Aviation Assessment
CARA	Conservation of Agricultural Resources Act, No. 43 of 1983
CBA	Critical Biodiversity Area
CBD	Central Business District
CoGHSTA	Cooperative Governance, Human Settlements and Traditional Affairs
DEA&DP	Department of Environmental Affairs & Development Planning
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, No. 73 of 1989
ECO	Environmental Control Officer
EDL	Episodic Drainage Line
EE	Engineers Environmental
EIA	Environmental Impact Assessment
EM	Environment Manager / Environmental Monitor
EMPr	Environmental Management Programme
EMS	Environmental Management System
EO	Environmental Officer
ES	Engineers Social
GDP	Gross Domestic Product
GG	Government Gazette
GN	Government Notice
HIA	Heritage Impact Assessment
(H)	Horizontal distance
IDP	Integrated Development Act
I&APs	Interested and Affected Parties
ISO	International Organisation for Standardisation
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LIHRA	Limpopo Heritage Resources Authority
LWUA	Lebalelo Water User Association
MLM	Mogalakwena Local Municipality
MWMP	Mogalakwena Water Master Plan
NCR	Non-Conformance Report
NDP	National Development Plan 2023
NEMA	National Environmental Management Act, No. 107 of 1998
NEM: BA	National Environmental Management: Biodiversity Act, No. 10 of 2004
NEM: WA	National Environmental Management: Waste Act, No. 59 of 2008
NEM:QA	National Environmental Management: Air Quality, No. 39 of 2004
NFA	National Forest Act, No. 84 of 1998
NHRA	National Heritage Resources Act, No. 25 of 1999
NWA	National Water Act, No. 36 of 1998
OHSA	Occupational Health and Safety Act, No. 85 of 1993
OLS	Obstacle Limitation Surface
OMMP - BRWSP	Olifants Management Model Programme Bulk Raw Water Study Phase
ORWRDP – 2	Olifants River Water Resources Development Project Phase 2
PAC	Powder Activated Carbon
PCD	Pollution Control Dam
PDCA	Plan – Do – Check – Act
PIA	Palaeontological Impact Assessment
PI	Project Implementer
PM	Particulate Matter
PPE	Personal Protective Equipment

PPP	Public Participation Process
Rhr	Randian-aged Hout River gneisses
rRoD	Revised Record of Decision
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SEIR	Scoping and Environmental Impact Reporting
SIA	Socio-economic Impact Assessment
SIP	Strategic Integrated Project
SM	Social Monitor
SMME	Small, Medium, and Micro Enterprises
SMP	Social Monitoring Plan
SO	Social Officer
SPLUMA	Spatial Planning and Land Use Management Act, No. 16 of 2013
SVcb	Species of Conservation Concern
SWMP	Stormwater Management Plan
TA	Traditional Authority
TCTA	Trans-Caledon Tunnel Authority
TIA	Terrestrial Impact Assessment
TLGFA	Traditional Leadership and Governance Framework Act, No. 41 of 2003
TSP	Total Suspended Particles
(V)	Vertical distance
WBPA	Waterberg–Bojanala Priority Area
WDM	Waterberg District Municipality
WML	Waste Management License
WMP	Waste Management Plan
WSA	Water Services Authority
WSDP	Water Services Development Plan
WTR	Water Treatment Residue
WTW	Water Treatment Works
WUA	Water Use Authorisation
WUL	Water Use Licence
ZNJV	Zutari Ndodana Joint Venture

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF

ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM

BASIC ASSESSMENT REPORT - EIA REGULATIONS, 2014

Basic Assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

File Reference Number:	

	(For official use only)
NEAS Reference Number:	
Date Received:	
Due date for acknowledgement:	
Due date for acceptance:	
Due date for decision	

Kindly note that:

1. The report must be compiled by an independent Environmental Assessment Practitioner.

2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

3. Where applicable **tick** the boxes that are applicable in the report.

4. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the Department of Economic Development, Environment and Tourism as the competent authority (Department) for assessing the application, it may result in the rejection of the application as provided for in the regulations.

5. An incomplete report may be returned to the applicant for revision.

6. Unless protected by law, all information in the report will become public information on receipt by the department. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

7. The Act means the National Environmental Management Act (No. 107 of 1998) as amended.

8. Regulations refer to Environmental Impact Assessment (EIA) Regulations of 2014.

9. The Department may require that for specified types of activities in defined situations only parts of this report need to be completed. No faxed or e-mailed reports will be accepted.

10. This application form must be handed in at the offices of the Department of Economic Development, Environment and Tourism:-

Postal Address:	**Physical Address:**
Central Administration Office Environmental Impact Management P. O. Box 55464 **POLOKWANE** 0700	Central Administration Office Environmental Affairs Building 20 Hans Van Rensburg Street / 19 Biccard Street **POLOKWANE** 0699
Queries should be directed to the Central Administration Office: Environmental Impact Management:- **For attention:** Mr E. V. Maluleke **Mobile:** 082 947 7755 **Email:** malulekeev@ledet.gov.za	

View the Department's website at http://www.ledet.gov.za/ for the latest version of the documents.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	**YES**	~~NO~~

If YES, please complete the form entitled "Details of specialist and declaration of interest" or appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail[1]:

BACKGROUND INFORMATION:

The Zutari Ndodana Joint Venture (ZNJV)[2] was previously appointed by the Trans-Caledon Tunnel Authority (TCTA), on behalf of the Department of Water and Sanitation (DWS) for the provision of professional services for the Olifants River Water Resources Development Project – Phase 2 (ORWRDP-2). Initially the Project comprised of the following phases (refer to **Figure 1**):

- Phase 2A: Construction of De Hoop Dam
- Phase 2B: Pipeline from Flag Boshielo Dam to Pruissen near Mokopane (72km)
- Phase 2B+: New pipe for 2B extension, where existing raw water pipeline to Sekuruwe commences
- Phase 2C: Pipeline from De Hoop Dam to Mooihoek
- Phase 2D: Pipeline from Steelpoort to Mooihoek (24km)
- Phase 2E: Pipeline from Mooihoek to Havercroft Junction (14km)
- Phase 2F: Pipeline from Havercroft Junction to Olifantspoort (44km)
- Phase 2G: Possible second pipeline parallel to Phase 2B
- Phase 2H: Changes and additions to the current Phase 2H (Lebalelo Network); and
- Phase 2I: Pipeline from the De Hoop Dam to the proposed Eskom Tubatse Pump-storage Hydro-electric Scheme (this Phase has been cancelled).

[1] Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice but should be a brief description of activities to be undertaken as per the project description.

[2] Previously referred to as Aurecon

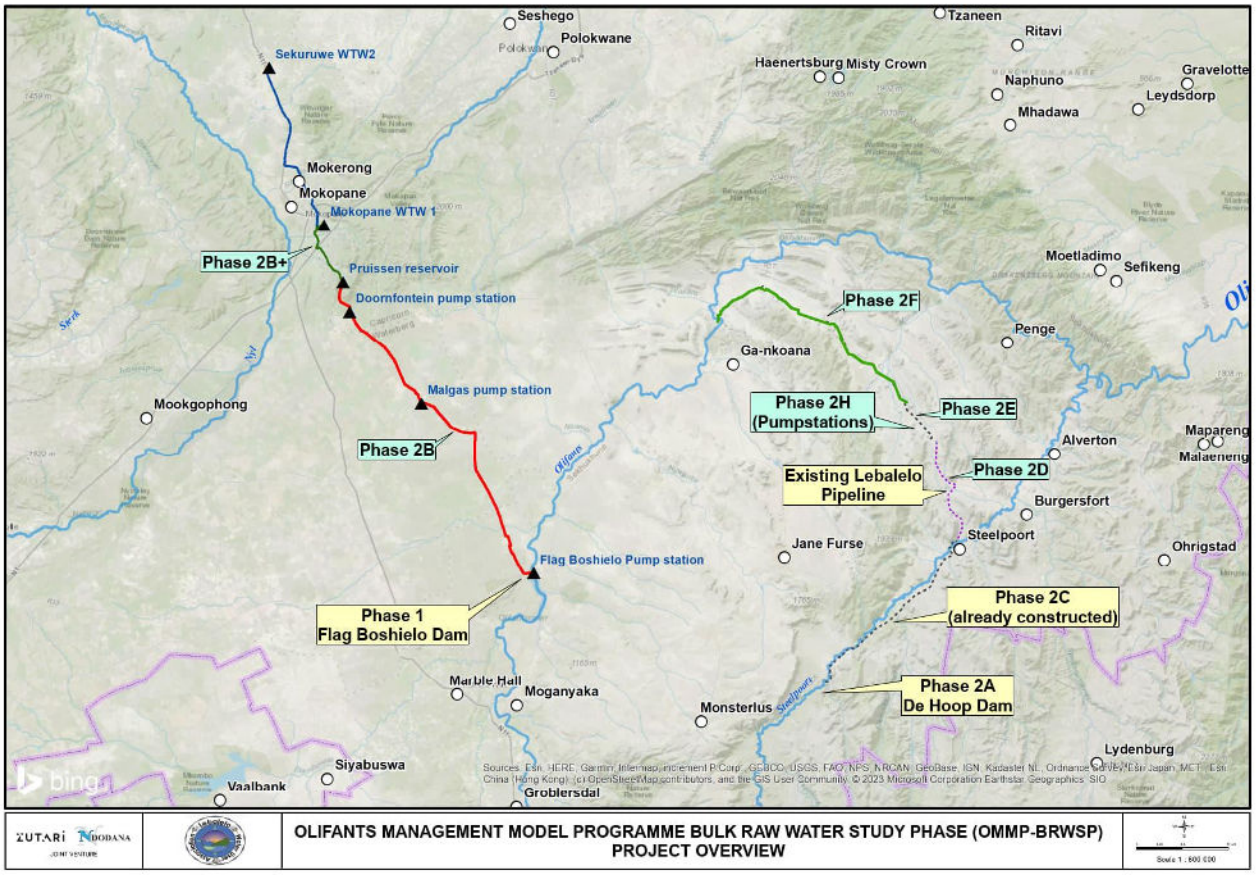

Figure 1: Map indicating the alignment of the different pipelines for the various Phases. The Northern Limb includes Phases 2B and 2B+ while the Eastern Limb consists of the phases in the east section of the project (i.e., Phases 2H, 2F, 2E and 2D).

The ORWRDP-2 has since been reconstituted to become the Olifants Management Model Programme Bulk Raw Water Study Phase (OMMP–BRWSP) in recent years, with the Lebalelo Water User Association (LWUA) acting as the implementing agent for the following portions of the project:

- Phase 2B
- Phase 2B+; and
- Phase 2F

LWUA, has appointed the ZNJV for the provision of professional services for the OMMP-BRWSP. The OMMP-BRWSP bulk infrastructure plan makes provision for the construction of raw water pipeline systems to the identified target areas. These bulk pipeline systems are now identified by their respective "Phase" number. The relevant bulk pipe that would augment raw water to the Mogalakwena system (i.e., for domestic and mine use) is the proposed Phase 2B pipeline. Phase 2B has been authorised by a revised Record of Decision (rRoD) (Ref: **12/12/20/553**) issued in 2006 in terms of the Environmental Conservation Act, (No. 73 of 1989) (ECA). The proposed Water Treatment Works (WTW) are located in two locations along the alignment of Phase 2B+. This phase is an extension of Phase 2B and spans from Pruissen reservoir to Piet-se-Kop. The gravity pipeline has been authorised by Environmental Authorisation (EA) (**12/1/9/1-W120**) and EA (**12/19/1-W131**). The OMMP-BRWSP bulk infrastructure plan makes provision for the construction of raw water pipeline systems to the identified target areas.

The Mogalakwena Local Municipality (MLM) is a Water Services Authority (WSA) as contemplated in the Water Services Act (No. 108 of 1997). Therefore, the municipality is responsible for the realisation of the right to access

to basic water services: ensuring progressive realisation of the right to basic water services, subject to available resources (that is, extension of services), the provision of effective and efficient ongoing services (performance management, by laws) and sustainability (financial planning, tariffs, service level choices, environmental monitoring). The WSA has developed a Water Services Development Plan (WSDP) in conjunction with master plans for water and sanitation.

The planning for water and wastewater services in Mogalakwena culminated in the Mogalakwena Water Master Plan (MWMP). As part of the MWMP, two new WTWs are to be provided, namely a works serving the Mokopane Town with an ultimate capacity of 28 Ml/d and another servicing the areas north of Mokopane located near Sekuruwe Township with an ultimate design capacity of 21Ml/d (refer to **Figure 2**).

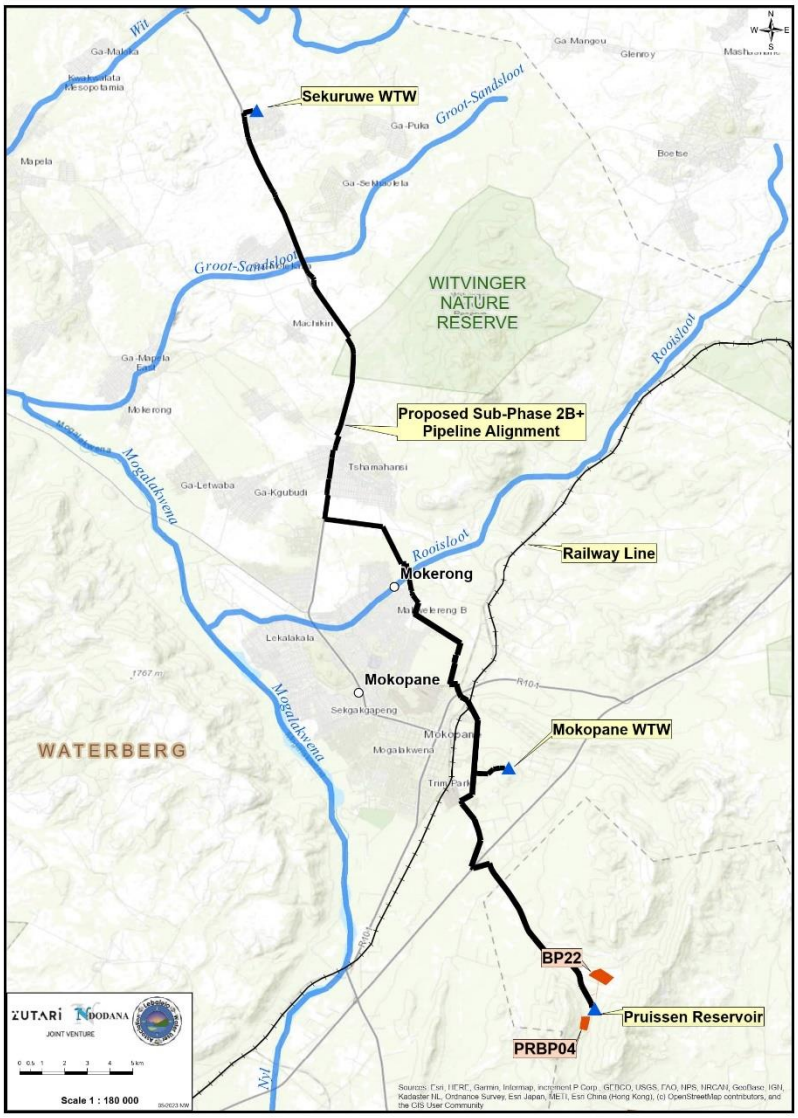

Figure 2: Map indicating the location of the proposed WTWs with respect to the alignment of Phase 2B+.

The technical features of the scheme proposed in the MWMP (for the ultimate scheme) include the following:

- A raw water pipe from the farm Pruissen (where it connects to the bulk water pipeline from Flag Boshielo Dam) to a new WTW (the Mokopane WTW). This works will supply potable water to Mokopane Central Business District (CBD) and town areas.

- The raw water pipe will continue from the WTW at Mokopane, northwards to the rural town area of Sekuruwe. At this point a second WTW (the Sekuruwe WTW) will be constructed. This WTW will be able to provide potable water to mining clients and residents for various rural villages.
- Mining water users will also be able to draw water from the raw water line at various points towards Sekuruwe. This will be handled by means of offtake agreements.

This Basic Assessment Report (BAR) has been compiled for the Sekuruwe WTW which is situated along the Phase 2B+ pipeline alignment. LWUA is proposing to construct the Sekuruwe WTW and associated infrastructure located north of the town of Sekuruwe near the Mogalakwena Platinum Mine, in the MLM. The overall objective of the proposed development is to supply potable water for commercial and residential purposes. A separate application for EA for the proposed Mokopane WTW will be submitted for evaluation and approval, as discussed, and agreed during the Pre-Application meeting held on 16 August 2023, and the minutes thereof attached as **Appendix G**.

PROJECT AREA (THE SEKURUWE WTW)

The Sekuruwe WTW is located north of the town of Sekuruwe, near the Mogalakwena Platinum Mine. The proposed site is located on an undeveloped, mostly topographically flat, parcel of land, generally sloping from south to north. This WTW had to be placed on the border of the rural supply area (at the township of Sekuruwe), but also downstream of the final take-off point for raw water. The elevation at this point would also be sufficient to receive raw water and supply potable water under gravity. The potential site is located on Portion 0 of the Farm Blinkwater 820 LR and Portion 0 of the Farm Gillimberg 861 LR (refer to **Figure 3**). The property is owned by the Republic of South Africa, under the management of Mapela Traditional Authority. The ultimate capacity of this WTW is proposed to be 21Ml/d.

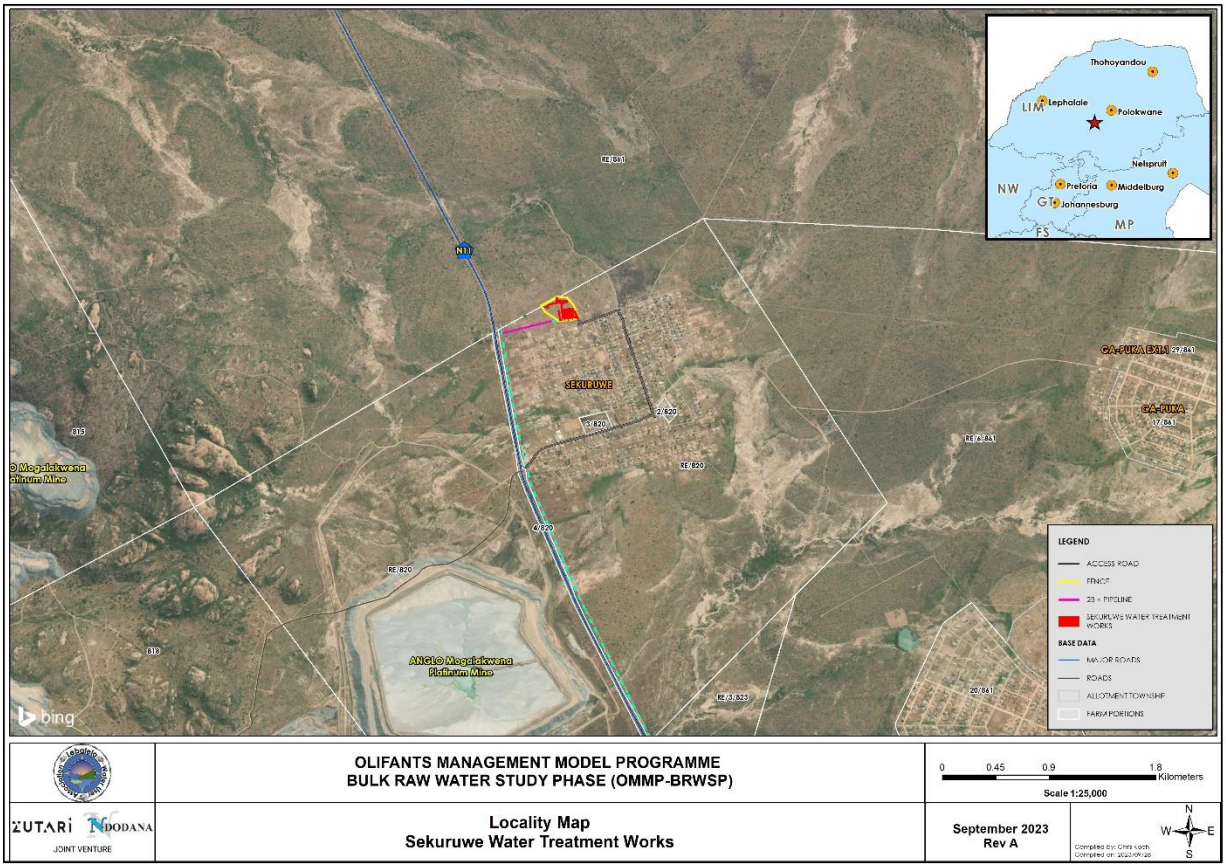

Figure 3: Locality Map of the proposed Sekuruwe WTW

This application involves the following components, including but not limited to, within the footprint applied for:

- **Guard house/ Access Control** for security purposes and for access control. The guardhouse is developed to accommodate guards who will be protecting the water service infrastructure and for controlling the access to both the reservoirs and the WTW;
- **Main administration buildin**g which includes a control room, the laboratory and the main administration areas (i.e., ablutions, workshop and store room);
- **Sludge lagoons** to dry the sludge produced from the WTW**;**
- **Machine Room;**
- A **Chemical Storage Area** for the safe handling and storage of chemicals delivered to and stored on site; and
- **Access and Internal Roads.**

OVERVIEW OF THE WTW PROCESS

The Mogalakwena Bulk Water Master Plan incorporates two new WTW (Mokopane and Sekuruwe), treating raw water transferred in a pipeline from the Flag Boshielo Dam. The treatment process selected includes the following stages (refer to **Appendix G** for a process flow diagram):

- Coagulation and Flocculation
- Dissolved air flotation
- Direct filtration
- Disinfection
- Stabilisation

The processes above are augmented or facilitated by the addition of chemicals to the process. These chemicals will include powder activated carbon (PAC) for taste and odour, Sodium Hydroxide (NaOH) and Sulfuric Acid (H2SO4) for pH control, Aluminium sulphate for coagulation, an organic polyelectrolyte to aid flocculation and chlorine for disinfection. The process will result in a waste stream (or 'treatment residue') to be stored on site in sludge lagoons and periodically removed from the site for ultimate disposal or re-use.

Since the proposed treatment works at Sekuruwe is now only in the design stage, there is no information on the quality and characteristics of water treatment residue (sludge) to be managed. A Water Treatment Residue (WTR) sample from an existing WTW (the Flag Boshielo WTW), that treats water from the same source as the proposed scheme (Flag Boshielo Dam), was therefore collected and analysed to serve as a proxy to guide the residue management plans. It is expected that, regardless of treatment processes adopted for the proposed works, the treatment residues will be similar in nature (containing coagulant precipitates and inert solids).

The analysis of the laboratory results of the WTR from the Flag Boshielo WTW in terms of current regulation in South Africa indicates that the WTR is classified as non-hazardous waste according to SANS 10234 and assessed to be Waste Type 3 which is suitable for disposal in a Class C landfill, an activity which requires a Waste Management License (WML). In the interest of sustainability, recycling and reuse of waste is preferable to its disposal. The laboratory results also indicate that the WTR is suitable for land application.

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;

(b) the type of activity to be undertaken;

(c) the design or layout of the activity;

(d) the technology to be used in the activity;

(e) the operational aspects of the activity; and

(f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the Department may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

MOTIVATION FOR THE PREFERRED SITE:

The Sekuruwe WTW receives water from the bulk gravity water supply line originating at Pruissen Farm and subsequently distributes treated, potable water. One of the prerequisites for the WTW was its strategic location, ensuring that treated water could flow naturally to the rural areas. Consequently, a hydraulic range of elevations between 1,222 meters above sea level (masl) and 1,250 masl was established. These elevations can be conveniently maintained in close proximity to the existing Sekuruwe Township.

For a visual representation of the site's location in relation to Sekuruwe town and the planned road upgrades during the WTW development, please refer to **Figure 4** below. It's noteworthy that the WTW had to be situated at the border of the rural supply area, precisely within the Sekuruwe Township, while also being downstream of the final raw water take-off point. This elevation ensures the facility can efficiently receive raw water and distribute potable water via gravity flow. Furthermore, the current preferred location is advantageous due to its close proximity to an existing pipeline constructed six years ago (EA number **12/19/1-W131)** for the purpose of supplying raw bulk water.

The plant's process design and site layout have been meticulously planned to accommodate future expansion of up to a full capacity of 42Ml/d. This capacity projection is based on anticipated future demands for water from the Sekuruwe WTW. To ensure that the plant can evolve to meet the region's evolving water needs over time, its development will proceed in phases. The first phase, for which we are currently seeking approval, is designed for a 21Ml/d capacity (please refer to **Appendix G** for the layout of structures on the Sekuruwe WTW site).

This is the only location alternative that will be considered in this BAR as it is deemed to be the only feasible activity and location alternative. The layout will not have a high negative impact on the environment, as long as it complies with the criteria listed in this report as well as an Environmental Management Programme (EMPr) appended in **Appendix F**. The operational aspects of the activity will contribute towards improving the general livelihood of the local communities. It will address the goals of the MLM, which include, but are not limited to, the responsibility for realising the right to access basic water services and ensuring the progressive realisation of the right to basic water services. It is mandatory to consider the "no-go" option in the EIA process. The "no-go" alternative refers to the current

status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable.

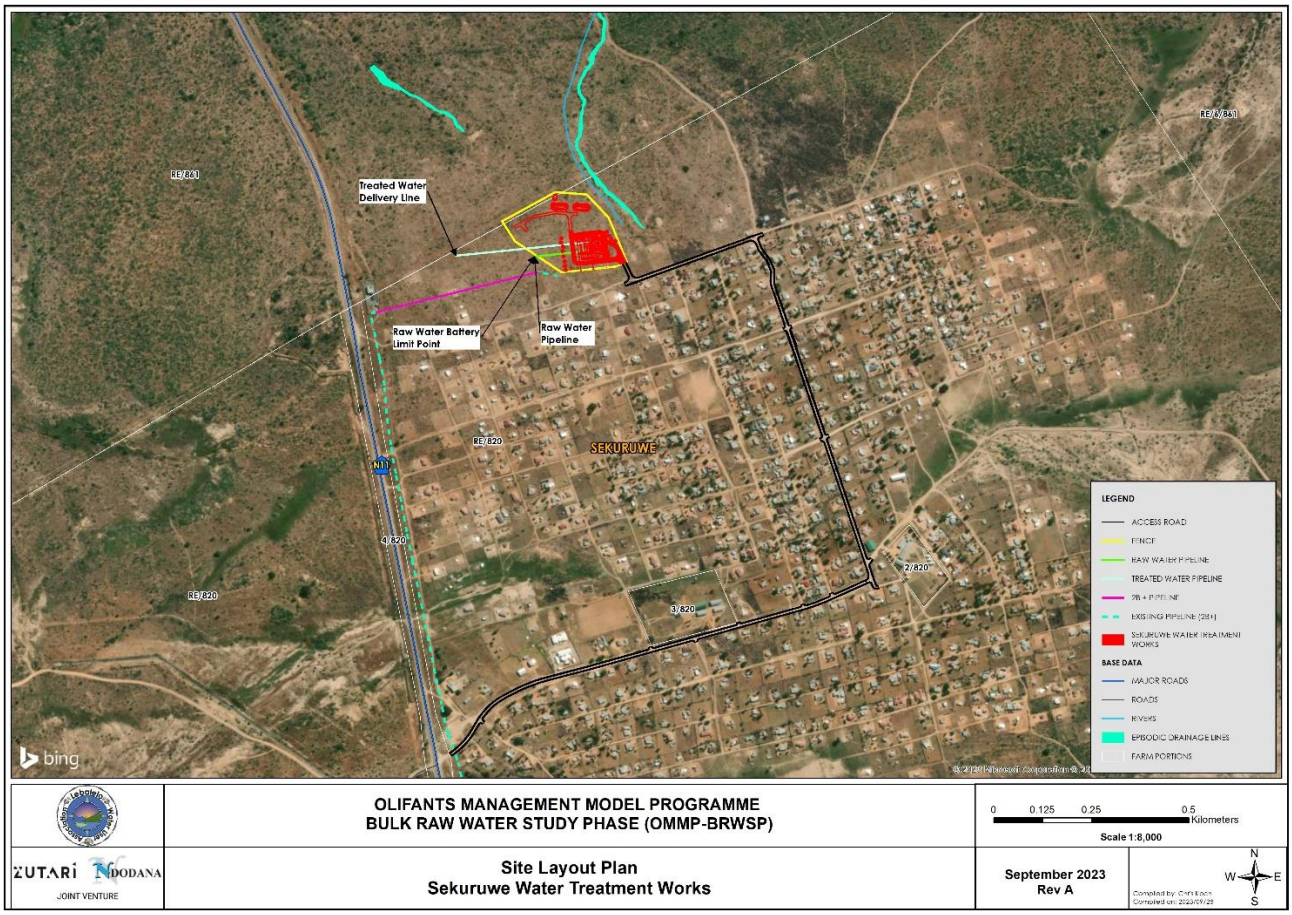

Figure 4: Location of Sekuruwe WTW site

Paragraphs 3 – 13 below should be completed for each alternative.

3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the Hartebeeshoek 94 WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1[3] (preferred or only site alternative)	23°	55'	56.25"	28°	56'	28.25"
~~Alternative S2 (if any)~~	°	'	"	°	'	"
~~Alternative S3 (if any)~~	°	'	"	°	'	"

[3] "Alternative S.." refer to site alternatives.

Site Corner Coordinates for the proposed WTW:

Position	Latitude (S):			Longitude (E):		
Corner 1 (west corner)	23˚	55'	54.93"	28˚	56'	22.90"
Corner 2 (northern corner)	23˚	55'	52.47"	28˚	56'	27.34"
Corner 3 (northeast corner)	23˚	55'	52.70"	28˚	56'	29.93"
Corner 4 (east corner)	23˚	55'	54.59"	28˚	56'	31.75"
Corner 5 (southeast corner)	23˚	55'	58.26"	28˚	56'	33.24"
Corner 6 (southeast corner)	23˚	55'	58.64"	28˚	56'	32.34"
Corner 7 (southern corner)	23˚	55'	59.09"	28˚	56'	27.84"
Corner 8 (southwest corner)	23˚	55'	56.54"	28˚	56'	23.99"

In the case of linear activities: NOT APPLICABLE

Alternative:	**Latitude (S):**			**Longitude (E):**		
~~Alternative S1 (preferred or only route alternative)~~						
• ~~Starting point of the activity~~	°	'	"	°	'	"
• ~~Middle/Additional point of the activity~~	°	'	"	°	'	"
• ~~End point of the activity~~	°	'	"	°	'	"
~~Alternative S2 (if any)~~						
• ~~Starting point of the activity~~	°	'	"	°	'	"
• ~~Middle/Additional point of the activity~~	°	'	"	°	'	"
• ~~End point of the activity~~	°	'	"	°	'	"
~~Alternative S3 (if any)~~						
• ~~Starting point of the activity~~	°	'	"	°	'	"
• ~~Middle/Additional point of the activity~~	°	'	"	°	'	"
• ~~End point of the activity~~	°	'	"	°	'	"

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[4] (preferred activity alternative)	39 281 m^2
~~Alternative A2 (if any)~~	m^2
~~Alternative A3 (if any)~~	m^2

or,

for linear activities: **NOT APPLICABLE**

Alternative:	**Length of the activity:**
~~Alternative A1 (preferred activity alternative)~~	m
~~Alternative A2 (if any)~~	m
~~Alternative A3 (if any)~~	m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative: NOT APPLICABLE	**Size of the site/servitude:**
~~Alternative A1 (preferred activity alternative)~~	m^2
~~Alternative A2 (if any)~~	m^2
~~Alternative A3 (if any)~~	m^2

5. SITE ACCESS

Does ready access to the site exist?	**YES**	~~**NO**~~
If NO, what is the distance over which a new access road will be built	m	

Describe the type of access road planned:

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[4] "Alternative A.." refer to activity, process, technology or other alternatives.

The site is situated approximately 400m east of the national road, the N11. Access to the site will be through an existing road, that is approximately 2.4km long. This road traverses an existing residential area of Sekuruwe and leads to the proposed Sekuruwe WTW.

This access road diverges from the N11 (at approximately point 23°56'39.70"S; 28°56'17.72"E) in a northeasterly direction for approximately 1.15km (1151m). It then proceeds to turn northwest for approximately 0.948km (948m) before finally veering west for about 0.25km (250m) toward the proposed Sekuruwe WTW. Notably, the first 1.84km (1840m) is an existing asphalt surfaced road and the remainder is an existing gravel road, which will be upgraded to an asphalt surfaced road. The proposed road will be 6m wide, with barrier kerbs and gravel sidewalks, which will provide a safe corridor for pedestrians. Dropped kerbs will be provided to ensure vehicular access to properties. As the road is in close proximity to a primary school, it is proposed that speed reducing measures be introduced. For this, raised intersections have been included at effective intervals. The road has a gentle grade, being not steeper than 5%. The existing road layers will, if suitable, be used in the re-construction of the existing road.

In the residential area the access road crosses over a hill on which there are 2 reservoirs and a water tower which serve the local community. These structures are situated within the road reserve. The proposed road will pass to the east of these structures and will encroach onto 3 residential properties. A 3m clear gap is allowed between the road edge and the structures to ensure the integrity of these structures. Arrangements will have to be made for the use of the additional ground required for the road to pass these structures. Just beyond the highpoint the road will form a T-junction. At this junction there is an existing tower which also restricts the road alignment. To comfortably accommodate the design vehicle at the T-junction, the roadworks will again encroach onto a residential property, and arrangements will have to be made here also for use of the additional land.

It is important to clarify that this existing gravel road is not part of this EA application (i.e., it does not trigger any listed activity in terms of the Environmental Impact Assessment (EIA) Regulations of 2014); rather, it has been included solely for the purpose of enhancing the understanding of the project.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

6.1 the scale of the plan which must be at least a scale of 1:500;
6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
6.4 the exact position of each element of the application as well as any other structures on the site;
6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
6.6 all trees and shrubs taller than 1.8 metres;
6.7 walls and fencing including details of the height and construction material;
6.8 servitudes indicating the purpose of the servitude;
6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):

- rivers;
- the 1:100 year flood line (where available or where it is required by Department of Water Affairs);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and

6.11 the positions from where photographs of the site were taken.

7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

11. ACTIVITY MOTIVATION

The below figures are estimated values and are representative of the Olifants Management Model Programme Bulk Raw Water Study Phase (OMMP-BRWSP), i.e., the entire project, including the Sekuruwe WTW.

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion? The overall expected contract capital value of the OMM Programme, inclusive of the two Northern Limb Water Treatment Works (WTWs) is R25 billion (excl. funding costs). The value of the two WTWs will be R650 million.	R650 million

What is the expected yearly income that will be generated by or as a result of the activity?	R22 million

The existing and new raw water and new bulk water infrastructure included in the OMM Programme scopes of work (inclusive of the Northern Limb WTWs) will be operated and maintained as an extension of the current Lebalelo Water User Association's operations and maintenance activities. The Association, of which membership is split on a 50/50 basis between Government (represented by Department of Water and Sanitation and the Water Service Authorities in the affected regions) and commercial/industrial sector in the region (more than 80% Platinum Mines), operates on a cost recovery model as a non-profit organisation directly managed by the Association's members. Revenue is therefore directly linked to the direct underlying operation and maintenance costs deployed by the Association, reserving requirements and debt service where applicable. Revenue will be generated from the Association's members based on recovering agreed costs in a combination of fixed and demand-dependent water tariffs invoiced.

Water from the overall network, including the WTWs will not be 100% utilised from day one with an expected gradual build-up of demand, matching the municipal and commercial sector growths in the region. Although the fixed tariff component is based on acquired capacity in the system by the respective member, due to the increased demand uptake over time, the yearly income will change annually over the life expectancy of the network, matching the water demands of the region.

Will the activity contribute to service infrastructure?	**YES**	~~NO~~

Yes, through the construction of Phases 2B and 2B+ from Flag Boshielo dam to Sekuruwe, the OMM Programme will deliver bulk raw water to the two (2) WTWs in the Northern Limb i.e. the 28 Ml/day Mokopane WTWs and the 21 Ml/day Sekuruwe WTWs. These two (2) WTWs will be used to treat the additional bulk raw water to potable water for residents within the Mogalakwena Local Municipality. Only ~25% of the treated water, included in the OMM Programme scope of work, will be distributed to rural communities within the Sekuruwe area and member doorstep communities in the Sekhukhune district. The remainder of the potable water is available for municipal distribution. The total volume of water that will be treated by the OMM Programme equates to more than 1 million additional individuals, at 65 litres per person per day, will be able to benefit from the programme.

In terms of the Northern Limb, over and above addressing the shortfall currently experienced at Mokopane, the OMM Programme will provide potable water, on a yard connection to ~130 000 people in the Sekuruwe area of the Mogalakwena Local Municipality.

The OMM Programme will also support the two affected Water Service Authorities with water management and conservation in the respective regions.

Is the activity a public amenity? Yes, the OMM Programme will support the treatment of a total of 94.5Ml/day of raw water for the Eastern and Northern Limb, split 50:50. This application is for the treatment of 28 Ml/day at Mokopane (to cater for the shortfall of 20 Ml/day in Mokopane) and 21 Ml/day at Sekuruwe for rural distribution to communities in that area. Water distribution will both tie into existing infrastructure to improve the reliability of supply, but also distributed to the public on a yard connection basis in the Sekuruwe region by the OMM Programme. Water not utilised by the previous statement is available to the Water Service Authority and local municipalities for distribution to the public.	**YES**	~~NO~~
How many new employment opportunities will be created in the development phase of the activity? Approximately 42 000 people will be impacted through direct, indirect and induced employment for the duration of the OMM Programme. The overall OMM Programme, inclusive of the two WTWs, will create 16,300 jobs in the Limpopo Province linked to the construction spend with a further 9,000 jobs linked to the ongoing operational spend. This exclude the extra jobs that will be created by the Commercial Members due to their access to water over the duration of the programme.	25 300 (direct & indirect)	
What is the expected value of the employment opportunities during the development phase? The OMM Programme will add an estimated R3.1 billion to the average annual household income based on the capital expenditure over the 7-year period and R2.4 billion linked to the operational spend in Limpopo Province over 28 years.	R5.5 billion	
What percentage of this will accrue to previously disadvantaged individuals? Based on the above additional R5.5 billion average annual household income, low-income groups within the Limpopo Province would receive approximately 30% (R0.93 billion) and 39% (R0.94 billion) respectively.	34%	
How many permanent new employment opportunities will be created during the operational phase of the activity? For clarification refer to the above descriptions.	9000	
What is the expected current value of the employment opportunities during the first 10 years? For clarity refer to the above descriptions.	R 3.1 billion the first 7-year period R2.4 billion operational spent, over 28-years	
What percentage of this will accrue to previously disadvantaged individuals? For clarification refer to the above descriptions.	34%	

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:

The OMMP-BRWSP (and previously the ORWRDP) was initiated to reduce the water demands on the Flag Boshielo Dam in the Limpopo province, which is the key water resource in the region. The project also aimed to meet the increasing water demand of the City of Polokwane, as well as allowing the respective WSAs to have surplus water to meet their water demands. The project bulk infrastructure plan allows for the construction of raw water pipeline systems to the identified target areas. The MWMP for the MLM (as mentioned previously, also a WSA) recognised the need for two separate WTWs. One of the required WTW is the proposed Sekuruwe WTW, which will treat raw water from the Flag Boshielo Dam and supply potable water for residential and commercial users.

The revised scope of the project will prioritise the following key aspects (of the OMMP-BRWSP):

- Abstract the LWUA scheme water primarily from the De Hoop dam instead of the Olifants River to relieve pressure on the already over-allocated Flag Boshielo Dam;
- Re-sequence the construction of OMMP-BRWSP bulk raw water infrastructure to meet revised water needs;
- Support existing potable WSAs and develop potable water infrastructure in defined areas in the Northern and Eastern Limb to address immediate and long-term social water needs of the WSAs.

Phase 2 of the project consists of four major components, namely, bulk water pipeline from De Hoop to Steelpoort; bulk distribution system comprising pipelines and pump stations from Steelpoort linking with the existing Olifants-Sand transfer scheme; bulk distribution system from the Flag Boshielo dam to Mokopane; and acquisition of the LWUA infrastructure for incorporation into the project. A bulk distribution system means that the Flag Boshielo and De Hoop dams will be able to function as a single system, thereby enabling a higher water supply level to the target areas.

Further, since inception, the project has acquired the status of strategic importance, and recently on 05 March 2023 the project was classified as a Strategic Integrated Project (SIP) under the SIP 19 (i.e., Water and Sanitation Infrastructure Portfolio). As such, it is critical that the project must be expedited in terms of Schedule 2 (Section 17(2)) of the Infrastructure Development Act (Act No. 23 of 2014). The purpose of this piece of legislation is to provide facilitation and coordination of public infrastructure development which is of economic significance or social importance in South Africa and to ensure that infrastructure development in the country is given priority in planning, approval, and implementation.

Importantly, the WSAs have been unable to realise the ambitions (i.e. to reduce water demands on the Flag Boshielo Dam, meet the increasing water demands of the City of Polokwane, and allowing the respective Water Service Authorities (WSAs) to have surplus water to meet their water demands) of the project on their own and the DWS has since appointed the LWUA to implement the most critical aspects of the scheme on their behalf. The DWS along with other stakeholders are working together to meet the following objectives:

- Delivering raw water and potable water to the region;
- Meeting the required water demand in the region; and
- Realising the socio-economic development expectations in the region.

In addition, delays in implementing the scheme, currently only partially implemented and not operational, have led to water infrastructure being vandalised, specifically the existing underground pipeline in Phase 2B+, authorised by EA (**12/19/1-W131**). It is thus critical for the project to proceed urgently to stabilise the region. Moreover, the need for clean drinking water is well documented and reasons for access to potable water include, and not limited to: • Safe drinking water that is not harmful to human health; • Reduce the reliance of rural communities (generally low-income households) on raw surface or groundwater water (i.e., often unsafe for human consumption); • Improved livelihood and quality of life; • Prevent, combat, or reduce the risk of contracting waterborne diseases; • Safe and readily available water is important to public health, whether it is used for drinking, domestic use, food production or recreational; and • Provision of adequate (clean) water supply infrastructure means less expenditure on health, as people are less likely to fall ill and incur medical costs (as a result of contracting waterborne disease), and importantly are better able to remain economically productive.			
i.	Was the relevant municipality involved in the application?	**YES**	~~NO~~
ii.	Does the proposed land use fall within the municipal Integrated Development Plan?	**YES**	~~NO~~
iii.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		
	N/A		

DESIRABILITY: Refer to the needs section above for context.			
i.	Does the proposed land use / development fit the surrounding area?	**YES**	~~NO~~
ii.	Does the proposed land use / development conform to the relevant structure plans, Spatial development Framework, Land Use Management Scheme, and planning visions for the area?	**YES**	~~NO~~
iii.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	**YES**	~~NO~~
iv.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
	N/A		
v.	Will the proposed land use / development impact on the sense of place?	~~YES~~	**NO**
vi.	Will the proposed land use / development set a precedent?	~~YES~~	**NO**
vii.	Will any person's rights be affected by the proposed land use / development?	**YES**	~~NO~~
viii.	Will the proposed land use / development compromise the "urban edge"?	~~YES~~	**NO**
ix.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		
	N/A		

BENEFITS:			
i.	Will the land use / development have any benefits for society in general?	**YES**	~~NO~~
ii.	Explain:		
	The implementation of the overall bulk water infrastructure under the OMMP-BRWSP would reduce the load on the Flag Boshielo Dam by abstracting water primarily from the De Hoop dam instead of the Olifants River to relieve pressure on the already over-allocated Flag Boshielo Dam. The project itself would develop the much-needed bulk water infrastructure, including the WTW required to treat raw water, and thereafter supply potable water to residents and commercial users. On a broader context, the project would contribute towards addressing water and sanitation challenges in the region. In addition, this WTW under the OMMP-BRWSP is a project of national strategic importance and aligns with the National Infrastructure Plan (NIP) and one of the critical actions of the National Development Plan (NDP): 2030 vision. More specifically, the objectives of the project would allow MLM, as a WSA to respond to the water demand, supply water and sanitation services to the communities falling within its area of jurisdiction. Thus, the overall project (OMMP-BRWSP) would ultimately benefit the local community, Mogalakwena region and the Limpopo Province. Further, the overall project would also have international significance, as it contributes to South Africa being able to support and meet its international obligations by aligning with the global Sustainable Development Goals (SDGs). These 17 SDGs are part of the 2030 Agenda, adopted by the United Nations (UN) General Assembly on 25 September 2015, for Sustainable Development. South Africa is a member of the United Nations (UN) and has committed to internationally agreed strategies to achieve these goals. The SDG target 6.1, calls for universal and equitable access to safe and affordable drinking water.		
iii.	Will the land use / development have any benefits for the local communities where it will be located?	**YES**	~~NO~~
iv.	Explain:		
	The community needs the project since it would benefit directly from the bulk water supply infrastructure. The project will provide potable water to the residents; and provide both raw and potable water to commercial users, thereby potentially enabling the provision of basic water-services and associated infrastructure. In addition, the Sekuruwe residents would benefit directly and obtain potable water from the WTW. Furthermore, at least 50+ people will be employed during the construction phase of the OMMP-BRWSP project.		

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Legal Requirements

Legislation considered	Relevant Organ of State / authority	Aspect of Project
The Republic of South Africa Constitution Act (Act No. 108 of 1996) ("the Constitution")	Parliament	The environmental right contained in Section 24 of the Constitution provides that everyone is entitled to an environment that is not harmful to his or her well-being.
National Environmental Management Act (Act No. 107 of 1998) (NEMA)	Competent Authority (LEDET)	NEMA establishes the principles for decision-making on matters affecting the environment. Section 2 of the Act sets out the National Environmental Management principles which apply to the actions of organs of state that may significantly affect the environment. Furthermore, Section 28(1) states that *"every person who causes or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring".* If such pollution or degradation cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution or degradation. The applicant has the responsibility to ensure that the proposed activity and EIA process conform to the principles of NEMA. In developing the EIA process, Zutari has taken cognisanance of this need, and accordingly the EIA process has been undertaken in terms of NEMA and the EIA Regulations[5]. Several listed activities in these regulations are triggered, as indicated in the application for EA form.
National Water Act (Act No. 36 of 1998) (NWA)	Department of Water and Sanitation (DWS)	The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA. Section 21 of the NWA specifies the water uses which require authorisation from the DWS in terms of the NWA before they may commence. LWUA is currently applying for Water Use Licenses (WULs) required in terms of Section 21 of the NWA.
National Heritage Resources Act (Act No. 25 of 1999) (NHRA)	South African Heritage Resources Agency (SAHRA) and/or Limpopo Heritage Resources Authority (LIHRA)	In terms of the NHRA, any person who intends to undertake "any development which will change the character of a site exceeding 5,000 m^2 in extent, or involving three or more existing erven or subdivisions thereof", "the construction of a road powerline, pipeline exceeding 300 m in length" or "the rezoning of site larger than 10,000 m^2 in extent…" must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely SAHRA or the relevant provincial heritage agency, in this case the LIHRA. These agencies will thereafter review the findings of a Phase 1 Heritage Impact Assessment (HIA) that would be undertaken by the specialist. Section 38(8) of the NHRA specifically excludes the need for a separate HIA where the evaluation of the impact of a development on heritage resources is required in terms of an EIA process. Accordingly, since the impact on heritage resources would be considered as part of the EIA process outlined here, no separate HIA would be required. SAHRA or the LIHRA, will review the heritage assessments and provide comments to the LEDET, which would

[5]GN No. R 982, 983, 984, and 985 in Government Gazette No.38282 of 4 December 2014.

		consider these comments in their final decision. However, should a permit be required for the damaging or removal of specific heritage resources such as Palaeontological or archaeological objects, a separate application for such destruction would need to be submitted to the SAHRA and/or LIHRA for approval.
Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)	Department of Agriculture	The CARA provides for the conservation of agricultural resources through limiting the sub-division of agricultural land, maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of water sources, protecting vegetation, and combating weeds and invader plants. As such, as part of the EIA process, recommendations should be made to ensure that measures are implemented to maintain the agricultural production of land (if possible).
National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM: BA)	Department of Forestry, Fisheries and the Environment (DFFE) and LEDET	The NEM:BA aims to conserve and manage the country's biodiversity through the protection of species and ecosystems, specifically those which are threatened or considered to be critically endangered. It also serves to regulate the management of alien vegetation. In terms of NEM:BA a list of endangered, critically endangered, vulnerable, and protected species has been promulgated (Section 6, Table 3 of the Act), which calls for an EIA process, should any of the listed species be identified on the site and need to be removed. An ecological impact assessment, comprising a wetland assessment, floral assessment, and faunal assessment, has been undertaken to determine if any listed species are located on the proposed site.
National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM: AQA)	Mogalakwena Local Municipality	The proposed WTW is within the Air Quality-Waterberg Bojanala Priority Area. This is a designated region in South Africa that has been identified as an area of particular concern regarding air quality and pollution. It is part of the South African government's efforts to manage and improve air quality in specific regions where pollution and air quality degradation pose significant environmental and health risks. Air quality management and improvement efforts are prioritized due to identified air quality challenges and their associated impacts on the environment, health, and local communities. During construction, the contractor must ensure that dust construction activities (i.e., excavators, TLB's and heavy vehicles (e.g., trucks) moving in and out of the construction area) comply with the prescribed standards of the NEM:AQA. Furthermore, the Act mandates measures for controlling dust emissions from construction sites. This may include the use of water sprays, dust screens, and other techniques to minimise dust pollution. In summary, the NEM:AQA in South Africa is relevant to construction projects as it governs emissions, dust control, and environmental authorisation requirements. Compliance with this legislation is essential to ensure that construction activities do not adversely impact air quality and to avoid potential legal consequences.
National Development Plan: A Vision for 2030	National Government	The South African Government through the Presidency has published a National Development Plan (NDP). The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes the following strategies to address the above goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy;

		4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; and 8.Transforming society and uniting the nation. Important, one of the enabling milestones is to ensure that all South Africans have access to clean running water in their homes by 2023. One of the proposed critical actions is public infrastructure investment at 10% of gross domestic product (GDP), financed through tariffs, public-private partnerships, taxes and loans focus on transport, energy and water.
Mogalakwena Local Municipality: Integrated Development Plan (IDP), Final 2023/2024	Mogalakwena Local Municipality	The IDP contains the strategies and goals for future development in the Mogalakwena Local Municipality. In terms of the District Development Model Waterberg District One Plan, the project is in line with the provision of bulk basic services such as renewable energy, and water supply. With regards to economic development, the project aligns with the strategy to strengthen and invest more in the development and maintenance of water, sanitation, electricity, and road infrastructure.
Spatial Planning and Land Use Management Act, 2013 (SPLUMA)	Mogalakwena Local Municipality	The land parcels on which the proposed Sekuruwe WTW will be constructed, will need to be verified to confirm if the current land use, according to the municipality's town planning scheme, is appropriate for the planned WTW.
National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA)	CA (LEDET)	The raw water treatment process will continuously produce a "treatment residue" (i.e., dry sludge from the sludge lagoons), which will be stored on site and periodically removed for disposal or reuse. This activity will require authorisation through a Waste Management Licence (WML). This treatment residue or dry sludge will be disposed of at a licensed landfill, and there is also an option to use the dry sludge for land application. It is worth mentioning that at an existing Flag Boshielo WTW, a treatment residue sample was collected, analysed and the results classified the treatment residue as non-hazardous waste according to SANS 10234 and assessed to be Waste Type 3 which is suitable for disposal in a Class C landfill, an activity which requires a WML. The proposed Sekuruwe WTW will treat water from the same source as Flag Boshielo WTW. It is expected that, regardless of treatment processes adopted for the proposed Sekuruwe WTW, the treatment residue will be similar in nature (containing coagulant precipitates and inert solids) as the sample collected at Flag Boshielo WTW.
Traditional leadership and governance framework amendment act (Act No. 23 of 2009)	Limpopo Department of Cooperative Governance, Human Settlements and Traditional Affairs (CoGHSTA).	The Act provides for the establishment and recognition of Traditional Councils, defines the roles and powers of traditional leaders, and provides for dispute resolution and the establishment of a Commission on Traditional Leadership Disputes and Claims. The authority of the Tribal Authorities in the project area, in terms of acting on behalf of communities in their area of jurisdiction during land acquisition negotiations and granting access for construction work, therefore derives from the provisions of this Act. The proposed Sekuruwe WTW is on property owned by the Republic of South Africa, under the management of the Mapela Traditional Authority (TA). Therefore, the Mapela TA will have to be consulted during the Public Participation Process (PPP) and when construction commences.
Restitution of Land Rights (Act 22 of	Commission on Restitution of Land	The Restitution of Land Rights Act (Act 22 of 1994) provides a legal framework for the restitution of land to people who were forcibly removed

1994	Rights.	from their land or dispossessed of it under previous discriminatory laws or practices. The Act allows for claims to be made by individuals, communities, or families who were dispossessed of their land after 19 June 1913. It establishes a Commission on Restitution of Land Rights to investigate and assess claims, and to recommend the restoration of land or alternative forms of compensation. The Act was amended in 2014 to extend the deadline for lodging claims to 30 June 2019 and to provide for the appointment of a Chief Land Claims Commissioner to oversee the process of restitution. The amendment also provides for the reopening of the lodgement period for certain claims that were previously rejected, as well as the introduction of a special dispensation for farm dwellers and labour tenants. There are parcels of land claimed by individuals on the footprint of the proposed Sekuruwe WTW.
National Forest Act (Act No. 84 of 1998) (NFA)	DFFE	The National Forests Act provides protection for forests, woodlands and several specified species of trees, which are protected across South Africa. The latest list of protected trees, dating from 2014, contains a total of 47 species, specimens of which may not be cut or damaged without a permit. Prior to site clearing, for all NFA-protected tree species within the footprint area (i.e., *Sclerocarya birrea subsp. caffra*), permit applications must be applied for their removal. Permits should be obtained from DFFE.

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**	~~NO~~
If yes, what estimated quantity will be produced per month? It is estimated that two skips of waste will be produces, per day, during the construction phase, More details will be provided when submitting the final BAR.	Approx.10 - 20m^3	

How will the construction solid waste be disposed of (describe)?

It is anticipated that some construction solid waste will be generated which would include (list is not exhaustive) building rubble, packaging material, scrap, overburden material and general litter from construction workers. Therefore, it is recommended that construction waste or rubble be collected and stored temporarily in designated containers for the different waste streams on site and disposed of at a licensed landfill site.

Where will the construction solid waste be disposed of (describe)?

Construction solid waste will be disposed of at a licensed landfill site and will be the responsibility of the relevant construction contractors.

Will the activity produce solid waste during its operational phase?	**YES**	~~NO~~

If yes, what estimated quantity will be produced per month?	Approx. 5070 kg/month

Filter backwash water (the waste stream from the WTW) will be sent to the backwash recovery tanks (BWRT). From the BWRT supernatant will be pumped back to the head of the works and the settled sludge sent to the silt lagoons. At the lagoons, the sludge will be allowed to dry out and cleaned every six months. For the Sekuruwe WTW, the expected dry solid waste per month is 5070kg/month. Supernatant overflow from the lagoons will be conveyed to the Mokopane WTW stormwater system.

How will the solid waste be disposed of (describe)?

The raw water treatment process will continuously produce a "treatment residue" (i.e., dry sludge from the sludge lagoons), which will be stored on site and periodically removed for disposal or reuse. This treatment residue or dry sludge will be disposed of at a licensed landfill, and there is also an option to use the dry sludge for land application. It is important to note that the Sekuruwe WTW is now only in design stage, therefore, the amount of treatment residue will be known and made available during the operation phase.

In light of the above, it is worth mentioning that at an existing Flag Boshielo WTW, a treatment residue sample was collected, analysed and the results classified the treatment residue as non-hazardous waste according to SANS 10234 and assessed to be Waste Type 3 which is suitable for disposal in a Class C landfill, an activity which requires a WML. The proposed Sekuruwe WTW will treat water from the same source as Flag Boshielo WTW. It is expected that, regardless of treatment processes adopted for the proposed Sekuruwe WTW, the treatment residue will be similar in nature (containing coagulant precipitates and inert solids) as the sample collected at Flag Boshielo WTW.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

As indicated, construction waste will be disposed of at a licensed landfill. It is anticipated that the resultant treatment residue from the Sekuruwe WTW will be disposed of at a Class C landfill during operation. This is solely based on the classification and assessment results of the treatment residue from the Flag Boshielo WTW (refer to paragraph above). Another option, that is currently being considered, will be to reuse the sludge in land application. Should the waste assessment and classification of the Sekuruwe WTW sludge reveal otherwise, the department will be notified.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the department to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	~~YES~~	**NO**[6]

If yes, inform the department and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?	~~YES~~	**NO**

If yes, then the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

[6] A waste assessment and classification will be done on the sludge that will be produced from the treatment of raw bulk water. Only then will the applicant know the category (i.e., hazardous, or non-hazardous) of waste produced.

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	**NO**
If yes, what estimated quantity will be produced per month?	N/A	
Will the activity produce any effluent that will be treated and/or disposed of on site?	~~YES~~	**NO**

If yes, the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	~~YES~~	**NO**

If yes, provide the particulars of the facility:

Facility name:	N/A		
Contact person:	N/A		
Postal address:	N/A		
Postal code:	N/A		
Telephone:	N/A	Cell:	N/A
E-mail:	N/A	Fax:	N/A

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

During construction the normal sewage will be handled via temporary ablution facilities (such as portable toilets) that will be serviced by a contractor on a regular interval (i.e., as, and when needed). During the operational phase, it is anticipated that there will be underground holding tanks (conservancy tanks) close to the administration building and the workshops. The sewage from these buildings will drain into these conservancy tanks and then will be removed for treatment by a vacuum truck, commonly referred to as a 'Honey-Sucker'. The frequency of the emptying of these tanks will need to be monitored as the plant becomes utilised.

Besides normal sewage, which will be handled via septic tanks or conservancy tanks that will be serviced by a contractor during construction, the only wastewater expected on site will be from the sludge lagoons. This water (i.e., supernatant from the sludge lagoons) is not expected to be re-used or recycled. However, options available for the discharge of the settled water are outlined in Section 12 (i.e., water use section) below.

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	**YES**	~~NO~~
If yes, is it controlled by any legislation of any sphere of government?	~~YES~~	**NO**

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

Dust from construction activities (i.e., excavators, TLB's and heavy vehicles (e.g., trucks) moving in and out of the construction area). The national dust control regulations under the NEM:AQA, were published in Government Gazette 34307 under GN309 on 27 May 2011. In terms of these regulations;

- No person may conduct any activity in such a way as to give rise to dust in such quantities and concentrations that –
  - The dust, or dust fall, has a detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions, or cultural heritage, or has contributed to the degradation of ambient air quality beyond the premises where it originates; or
  - The dust remains visible in the ambient air beyond the premises where it originates; or
  - 600 mg/m^2/day averaged over 30 days in residential and light commercial areas measured using reference method ASTM D1739; or
  - 1200 mg/m^2/day averaged over 30 days in areas other than residential and light commercial areas measured using reference method ASTM D1739.

A detailed Air Quality Study was undertaken to support this application (refer to **Appendix D**).

11(d) Generation of noise

Will the activity generate noise?	**YES**	~~NO~~
If yes, is it controlled by any legislation of any sphere of government?	~~YES~~	**NO**

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If no, describe the noise in terms of type and level:

Noise will mainly result from the usage of earthmoving equipment (e.g., excavators, back-actors & TLB's and heavy vehicles (e.g., trucks) moving into and out of the construction area. With that said, the surrounding owners and residents of Sekuruwe should be informed should any unusually noisy activities (i.e. blasting) be undertaken or if construction activities are set to continue beyond normal working hours (i.e., 7am – 5pm). Furthermore, the plant will be fitted with noise reduction measures.

12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	~~water board~~	**groundwater**	**river, stream, dam or lake**	~~other~~	~~the activity will not use water~~

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	67.6 m^3/month	
Does the activity require a water use permit from the Department of Water Affairs?	**YES**	~~NO~~

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

A water use licence application will be submitted DWS for the overall OMMP-BRWSP project. It is expected that the process silt lagoons will discharge settled supernatant from the filter backwash. The discharge from the lagoons needs to be registered with the DWS and it is expected it will easily fall within the water quality requirements of the General Authorisation (GA). The volume of discharge water anticipated will depend on the volume of water discharged to the lagoons from the Backwash water recovery tank (BWRT).

The following options are available for the discharge of the settled water from the lagoons:

a. Discharge into a local water course,
b. Supernatant from the backwash recovery tank will be pumped back to the head of works.

The nature of this project (i.e., Sekuruwe WTW) is to treat raw water to potable water quality standard. Water to be treated will be sourced from the Flag Boshielo Dam. The project itself will use the raw water during operation. Raw water (to be treated) will only be sourced when the pipelines conveying the water are built and the plant is commissioned at the end of the construction period.

During construction, the appointed contractor will be responsible for sourcing water for construction, however, it is anticipated that this water will either be sourced from the MLM, groundwater, or a river, stream, dam or lake as indicated in the box above. Should municipal water be required during construction, the contractor must obtain a service level agreement from the relevant municipality confirming the availability of the required volume of water.

13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The rooms in the building, such as all the offices and the laboratory have a natural outlook, they have natural lighting and ventilation and are ergonomically efficient.

In order to maximise energy in the design of Sekuruwe WTW, the following principles were undertaken during design:

- Direct sunlight minimised in summer, but maximised for the winter months;
- Allowing for sufficient thermal mass in the structures to insulate the structures where mostly required (i.e. administration building);
- Provided as much natural light as possible, to limit the requirement for lighting; and
- Utilisation of energy efficient technologies such as LED lighting and solar heated water supply; and
- Incorporation of passive ventilation.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The calculated load of the plant is 450kVA requiring a bulk supply to be provided to the plant by a 630kVA miniature substation with LV breaker for connection.

Currently, there is an ongoing assessment of the feasibility of utilising renewable energy to supply power to the pump stations tasked with facilitating the transfer of raw water from the Flag Boshielo dam to the envisioned WTWs. Additionally, an exploration into the potential adoption of renewable energy sources for the sustained operation of the WTW is underway.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases

please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):	N/A

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?

YES	~~NO~~

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description/physical address:	Remaining extent of the Farm Gillimberg 861 LR and remaining extent of the Farm Blinkwater 820 LR, near Sekuruwe in the Mogalakwena Local Municipality, Limpopo Province.
	(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.
	N/A
	In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.
Current land-use zoning:	Informal residential
	In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?	~~YES~~	**NO**
Must a building plan be submitted to the local authority?	~~YES~~	**NO**

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	**1:50 – 1:20**	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

~~Alternative S2 (if any):~~

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

~~Alternative S3 (if any):~~

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

~~2.1 Ridgeline~~		**2.6 Plain**	**X**
~~2.2 Plateau~~		**2.7 Undulating plain / low hills**	**X**
~~2.3 Side slope of hill/mountain~~		~~2.8 Dune~~	
~~2.4 Closed valley~~		~~2.9 Seafront~~	
~~2.5 Open valley~~			

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:		~~**Alternative S2 (if any):**~~		~~**Alternative S3 (if any):**~~	
Shallow water table (less than 1.5m deep)	~~YES~~	**NO**	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	~~YES~~	**NO**	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	~~YES~~	**NO**	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	~~YES~~	**NO**	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	~~YES~~	**NO**	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	~~YES~~	**NO**	YES	NO	YES	NO
Any other unstable soil or geological feature	~~YES~~	**NO**	YES	NO	YES	NO
An area sensitive to erosion	**YES**	~~NO~~	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	**Natural veld with scattered aliens[E]**	~~Natural veld with heavy alien infestation[E]~~	~~Veld dominated by alien species[E]~~	~~Gardens~~
~~Sport field~~	~~Cultivated land~~	~~Paved surface~~	~~Building or other structure~~	~~Bare soil~~

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area	**X**	5.22 School	
5.2 Low density residential		5.23 Tertiary education facility	
5.3 Medium density residential	**X**	5.24 Church	
5.4 High density residential		5.25 Old age home	
5.5 Medium industrial [AN]		5.26 Museum	
5.6 Office/consulting room		5.27 Historical building	
5.7 Military or police base/station/compound		5.28 Protected Area	
5.8 Spoil heap or slimes dam [A]		5.29 Sewage treatment plant [A]	
5.9 Light industrial		5.30 Train station or shunting yard [N]	
5.10 Heavy industrial [AN]		5.31 Railway line [N]	
5.11 Power station		5.32 Major road (4 lanes or more)	
5.12 Sport facilities		5.33 Airport [N]	

5.13 Golf course		5.34 Harbour	
5.14 Polo fields		5.35 Quarry, sand or borrow pit	
5.15 Filling station [H]		5.36 Hospital/medical centre	
5.16 Landfill or waste treatment site		5.37 River, stream or wetland	**X**[7]
5.17 Plantation		5.38 Nature conservation area	
5.18 Agriculture		5.39 Mountain, koppie or ridge	
5.19 Archaeological site		5.40 Graveyard	
5.20 Quarry, sand or borrow pit		5.41 River, stream or wetland	**X**
5.21 Dam or Reservoir		5.42 Other land uses (describe)	

If any of the boxes marked with an "[N] "are ticked, how will this impact / be impacted upon by the proposed activity?

N/A

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:	N/A
If NO, specify:	N/A

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	N/A
If NO, specify:	N/A

6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including	~~YES~~	**NO**
Archaeological or palaeontological sites, on or close (within 20m) to the site?	Uncertain	
If YES, explain:	N/A	
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.		
Briefly explain the findings of the specialist:	N/A	

[7] Freshwater Ecosystem HGM Type: River (Episodic Drainage Line)

Will any building or structure older than 60 years be affected in any way?	~~YES~~	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**YES**	~~NO~~

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

Refer to Appendix G for Public Participation documentation.

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the department) at a place conspicuous to the public at the boundary or on the fence of—

(i) the site where the activity to which the application relates is or is to be undertaken; and

(ii) any alternative site mentioned in the application;

(b) giving written notice to—

(i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;

(ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

(iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

(iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;

(v) the municipality which has jurisdiction in the area;

(vi) any organ of state having jurisdiction in respect of any aspect of the activity; and

(vii) any other party as required by the department;

(c) placing an advertisement in—

(i) one local newspaper; or

(ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the local municipality in which it is or will be

undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and

(e) using reasonable alternative methods, as agreed to by the department, in those instances where a person is desiring of but unable to participate in the process due to—

(i) illiteracy;

(ii) disability; or

(iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

(a) indicate the details of the application which is subjected to public participation; and

(b) state—

(i) that the application has been submitted to the department in terms of these Regulations, as the case may be;

(ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;

(iii) the nature and location of the activity to which the application relates;

(iv) where further information on the application or activity can be obtained; and

(v) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the department in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these Regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention

should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the department to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in these Regulations and be attached to this application. The comments and response report must be attached under Appendix E.

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

Name of Authority informed:	Comments received (Yes or No)
Mogalakwena Local Municipality (MLM)	No
Waterberg District Municipality (WDM)	No
Department of Water and Sanitation (DWS)	No
National Department of Forestry, Fisheries and the Environment (DFFE)	No
Department of Rural Development and Land Reform (DRDLR)	No
Regional Land Claims Commission	No
Limpopo Department of Sports, Arts and Culture	No
South African Heritage Resources Agency (SAHRA)	No
Roads Agency Limpopo	No
Limpopo Department of Public Works, Roads and Infrastructure	No
Limpopo Heritage Resources Authority (LIHRA)	No
Mapela Traditional Council	No

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the department.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?	~~**YES**~~	**NO**

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

This BAR is for public review and as such, no comments have yet been received. Once the review period has been completed, all comments received will be captured in this report. The commenting period is from Thursday, 5 October 2023 until Monday, 6 November 2023.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

This BAR is for public review and as such, no comments have yet been received. Once the review period has been completed, all comments received will be captured in this report.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

This BAR is for public review and as such, no comments have yet been received. Once the review period has been completed, all comments received will be captured in this report.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Please refer to Appendix D for the Impact Assessment Report which contains detailed information of the expected impacts, their significance and proposed mitigation measures.

Alternative (preferred alternative)

Direct impacts:

- Impact on the agricultural environment
- Impact on air quality
- Impact on freshwater biodiversity
- Impact on obstacle limitation surface (ols) and civil aviation
- Impact on the defence environment
- Impact on the geotechnical environment
- Impact on heritage resources
- Impact on hydrology
- Impact on the socio-economic environment
- Impact on terrestrial biodiversity
- Impact on the visual and landscape environment

Indirect impacts:

AQUATICS AND HYDROLOGY

Impacts associated with stormwater runoff and potential pollution may materialise if proper mitigation measures, as prescribed in the aquatic compliance report and the hydrological report, are not adhered to. Due to the disturbance of soil and removal of vegetation that will commence with the WTW construction activities, there may be an increase in alien and invasive species entering the system. In addition, the possible onset of erosion associated with construction activities and extending into the operational period of the development could transpire, given the nature of soils and the sloping nature of terrain in the area in which the proposed WTW and adjacent drainage line area located.

SOCIAL

Social impacts such as indirect community relations, expectations, and economic opportunities.

Cumulative impacts:

AQUATICS

Freshwater ecosystems within the region are under continued threat due to urban and mining related development and expansion, alien invasive vegetation encroachment and pressures associated with landuse practices in a communal rural setting. As detailed above, no direct impacts on the nearest freshwater ecosystems are likely to be generated as the footprint of WTW will be kept outside of the delineated extent of the adjacent drainage line and a certain area of vacant land located between the WTW and the delineated edge of the riparian zone. Accordingly, only indirect impacts could materialise on the Episodic drainage line draining to the north-east of the WTW site.

Should indirect impacts associated with stormwater runoff and potential pollution materialise, this would constitute a cumulative impact in terms of the further overall degradation of freshwater ecosystems in the wider area, especially as downstream reaches and other components of the wider drainage system could be impacted. Such a cumulative impact associated with the proposed development would be able to be avoided if the potential indirect impacts associated with the WTW were effectively mitigated or avoided.

Residual impacts arise from activities of which the effects persist long after the activity has ceased due to the self-perpetuating nature of such impacts (e.g., erosion). Residual impacts may cease with human remediation or when the trajectory of ecosystem imbalance caused by such an impact is complete. Due to the disturbance of soil and removal of vegetation that will commence with the WTW construction activities, there may be an increase in alien and invasive species entering the system, which may then persist long after construction activities have been completed. In addition, the possible onset of erosion associated with construction activities and extending into the operational period of the development could transpire, given the nature of soils and the sloping nature of terrain in the area in which the proposed WTW and adjacent drainage line area located. Such initiation of further erosion in the catchment of the drainage lines, in particular erosion associated with the clearing of vegetation and resultant, long term exposure of soils and associated altered runoff patterns may result in greater inputs of sediment into and eventual smothering of riparian vegetation over time.

It is expected that the impacts associated with the proposed WTW on the freshwater ecosystems in the adjacent area would be unlikely to contribute to residual effects on freshwater ecosystem habitat within the local area provided that cognisant, well-planned design is implemented.

SOCIAL

It is anticipated that cumulative impacts are likely to arise based on the combined effects of the proposed development as well as other existing and planned developments in the area. The three identified cumulative impacts which are likely to arise as a result of the proposed Sekuruwe WTW are linked to impact related to population influx, community health and multiplier effects on the local economy. It is anticipated that population influx if not managed is likely to place significant pressure on local resources, services, and infrastructure, including the formation of informal settlements, contributing negatively to community health. On the other hand, the proposed development, including other key developments in the area will result in several economic benefits for local communities through direct and multiplier effects.

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (preferred alternative)

This Section provides a summary of the specialist inputs, an assessment of the identified environmental impacts, key mitigations, and recommendations. For added detail, the reader should refer to the respective studies which are appended to the DBAR as **Appendix D**.

The following table below provides a summary of the pre-and post-mitigation impact and risk significance ratings. Significance ratings are ranked from very high (+) through to very high (-) in the tables and are identified in accordance with the following legend.

Legend:

Significance:	Negative (-)	Positive (+)
Very high		
High		
Moderate		
Low		
Very low		

Table 1 below gives a summary of the pre-and post-mitigation impact and risk significance ratings during the construction phase.

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Table 1: Summary of the pre-and post-mitigation impact and risk significance ratings during the construction phase

FIELD	IMPACT	PRE-MITIGATION: SIGNIFICANCE	POST-MITIGATION: SIGNIFICANCE
AIR QUALITY	TSP, PM10, PM2.5 and Gaseous Emissions	Low - negative	Very low
AQUATICS	Potential sedimentation of Episodic drainage line (EDL) due to site clearing and poor stormwater management	Very low	Very low
AQUATICS	Potential pollution of the adjacent drainage line due to poor management of hazardous materials such as paint and hydrocarbons	Very low	Very low
AQUATICS	Potential pollution of the adjacent drainage line due to poorly controlled cement mixing / batching	Very low	Very low
AQUATICS	Movement of vehicles and personnel in the adjacent drainage line and potential dumping of construction material / construction waste in the adjacent drainage line	Very low	Very low
AQUATICS	Potential pollution of down gradient drainage lines by sediment and other pollutants such as paint / bitumen	Very low	Very low
HERITAGE	Destruction of presently unknown Heritage Resources	Moderate - negative	Low - negative
PALAEONTOLOGY	Impact on Presently Unknown Fossil Heritage Resources	Very low	Very low
SOCIAL	Income for farm owners (Land access)	High - positive	High - positive
SOCIAL	Procurement of goods and services	Moderate - positive	High - positive
SOCIAL	Employment opportunities	Moderate - positive	High - positive
SOCIAL	Community expectations	High - negative	Low - negative
SOCIAL	Health, safety and security	Low - negative	Low - negative
SOCIAL	Traffic and damage to local access road	Moderate - negative	Very low
TERRESTRIAL BIODIVERSITY	Loss of Floral Habitat and Floral Diversity during construction (i.e., removal of vegetation and surface grading across the footprint areas)	Moderate - negative	Low - negative
TERRESTRIAL BIODIVERSITY	Loss of Floral SCC during construction (i.e., removal of vegetation and surface grading across the footprint areas)	Very low	Very low
TERRESTRIAL BIODIVERSITY	Loss of protected floral species (unlawful destruction/removal of protected floral species within the footprint areas due to failure to comply with national legislation regarding permit applications for the removal, destruction, and/or relocation of trees protected under the National Forest Act, 1998 (Act No. 84 of 1998) (NFA))	Moderate - negative	Low - negative

TERRESTRIAL BIODIVERSITY	Degradation of surrounding floral and faunal communities during operational and maintenance phase (i.e, poorly managed edge effects, including 1) introduction of alien and invasive plant (AIP) species with construction vehicles, 2) ineffective rehabilitation of compacted areas, bare soils, or eroded areas, 3) potential inadequate design of stormwater management and erosion control, resulting in increased risk of erosion and additional degradation of faunal and floral habitat beyond the footprint area, and 4) potential fragmentation of natural habitat by transport vehicles not using designated roads).	Moderate - negative	Low - negative
TERRESTRIAL BIODIVERSITY	Loss of Faunal Habitat and Diversity during construction (i.e., removal of vegetation and surface grading across the footprint areas, fauna being displaced due to construction activities etc.)	Moderate - negative	Low - negative
TERRESTRIAL BIODIVERSITY	Loss of Faunal SCC during construction (i.e., removal of vegetation and surface grading across the footprint areas)	Very low	Very low
VISUAL AND LANDSCAPE	Impact on Landscape Character and Sense of Place	Low - negative	Low - negative
VISUAL AND LANDSCAPE	Visual intrusion impacts	Moderate - negative	Low - negative
VISUAL AND LANDSCAPE	Visual exposure and visibility impacts	Moderate - negative	Low - negative
VISUAL AND LANDSCAPE	Impacts due to Night time lighting	Moderate – negative	Low - negative

Table 2 below gives a summary of the pre-and post-mitigation impact and risk significance ratings during the operation phase.

Table 2: Summary of the pre-and post-mitigation impact and risk significance ratings during the operation phase

FIELD	IMPACT	PRE-MITIGATION: SIGNIFICANCE	POST-MITIGATION: SIGNIFICANCE
AIR QUALITY	TSP, PM10, and PM2.5	Low - negative	Very low
AIR QUALITY	Gaseous Emissions	Low - negative	Very low
AQUATICS	Alteration of hydrology and geomorphology of adjacent drainage line due to poor operational stormwater management at the WTW.	Low - negative	Very low
AQUATICS	Alteration of hydrology, geomorphology and water quality of adjacent drainage line due to leakage or accidental discharge of untreated raw water into the adjacent drainage line.	Moderate - negative	Low - negative
SOCIAL	Employment opportunities	High - positive	Very high - positive
SOCIAL	Access to potable water for selected communities in the Northern limb.	High - positive	Very high - positive
SOCIAL	Community expectations	High - negative	Low - negative
SOCIAL	Health and safety	High - negative	Low - negative
VISUAL AND LANDSCAPE	Impact on Landscape Character and Sense of Place	Low - negative	Low - negative
VISUAL AND LANDSCAPE	Visual intrusion impacts	Moderate - negative	Low - negative
VISUAL AND LANDSCAPE	Visual exposure and visibility impacts	Moderate - negative	Low - negative
VISUAL AND LANDSCAPE	Impacts due to Nighttime lighting	Moderate – negative	Low - negative

Table 3 below gives a summary of the pre-and post-mitigation impact and risk significance ratings during the decommission phase.

Table 3: Summary of the pre-and post-mitigation impact and risk significance ratings during the decommission phase.

FIELD	IMPACT	PRE-MITIGATION: SIGNIFICANCE	POST-MITIGATION: SIGNIFICANCE
SOCIAL	Employment and business opportunities	Moderate - positive	High - positive
SOCIAL	Health and safety	Low - negative	Very low
SOCIAL	No access to potable water	Very high - negative	Moderate - negative
SOCIAL	Loss of employment and business opportunities	Very high - negative	Low - negative

3.1. GEOTECHNICAL INVESTIGATION (ZUTARI, 2023)

The desktop geotechnical investigation was undertaken by Zutari (Pty) Ltd. The intention of the geotechnical desktop study was to provide a site sensitivity verification assessment of the site as it pertains to the EA process. The desktop study therefore focused on the geotechnical aspects of the site from an environmental perspective. The assessment was limited to a desktop study only and no site walk-over was conducted.

A. Baseline environment

The description of the environmental baseline has been informed by specialist studies undertaken, particularly the information from the geotechnical investigation.

1. Site Geology

The geological setting of the proposed Sekuruwe water treatment works is shown in the 1:250 000 geology map in **Figure 5**. According to the map, the footprint of the water treatment facility is underlain by the Randian-aged Hout River gneisses (Rhr). The lithology is described as grey muscovite-biotite gneiss: leuocogneiss or leucrogranie; banded gneiss, and migmatitic gneiss. Approximately 500m north of the site, a diabase dyke is located, striking in the west-northwest to east-southeast direction. A concealed/inferred fault striking northeast is located 2km south of the site. According to the geological map, no major faults, dykes, or shear zones are present within the site boundary.

To the southwest of the proposed site location, the geological formation changes to Utrecth Granite, an intrusive rock from the Vaalian age. The lithology is described as fine-grained, pink biotite granite. West of the proposed site location, the geological formation changes to Mapela Gabbronorite, forming part of the Rustenburg Suite of the Bushveld Complex, and the lithology is described as gabbro, norite, anorthosite, pyroxenite, harzburgite, troctolite.

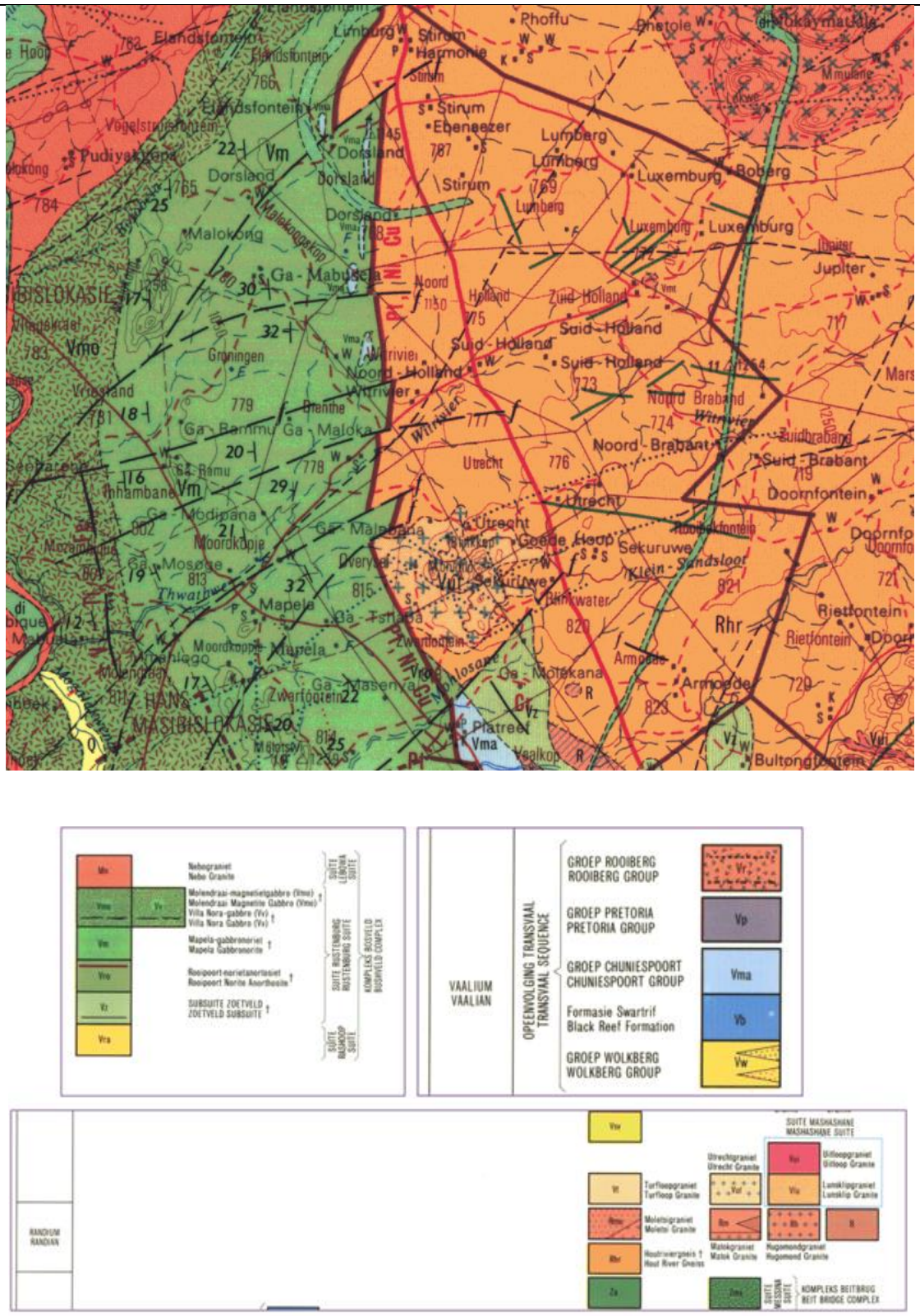


Figure 5: Regional geological setting of the site (from 1:250 000 Geological map; Sheet 2328 Polokwane, Council for Geoscience, 1985).

The site is not underlain by potentially soluble rock such as dolomite. However, for reference, as shown in **Figure 6**, the Council for Geoscience (2023) indicates that there is a possibility of dolomitic land approximately 6km west of the site. This possible dolomitic area coincides with areas of serpentinized dolomite (Vma) on the geological

map. Notwithstanding, the dolomite is a considerable distance away from the site and is not considered a risk for the current site.

Figure 6: Inferred dolomitic risk map in the Limpopo Province South Africa (Council for Geoscience, 2023).

2. Climate

As indicated in **Figure 7** below, the site is situated in an area with a Weinert N-value in the order of N=3.3 (Weinert, 1980). Decomposition (chemical weathering) is therefore the expected mode of weathering at the site, and deeper residual profiles may have resulted over time.

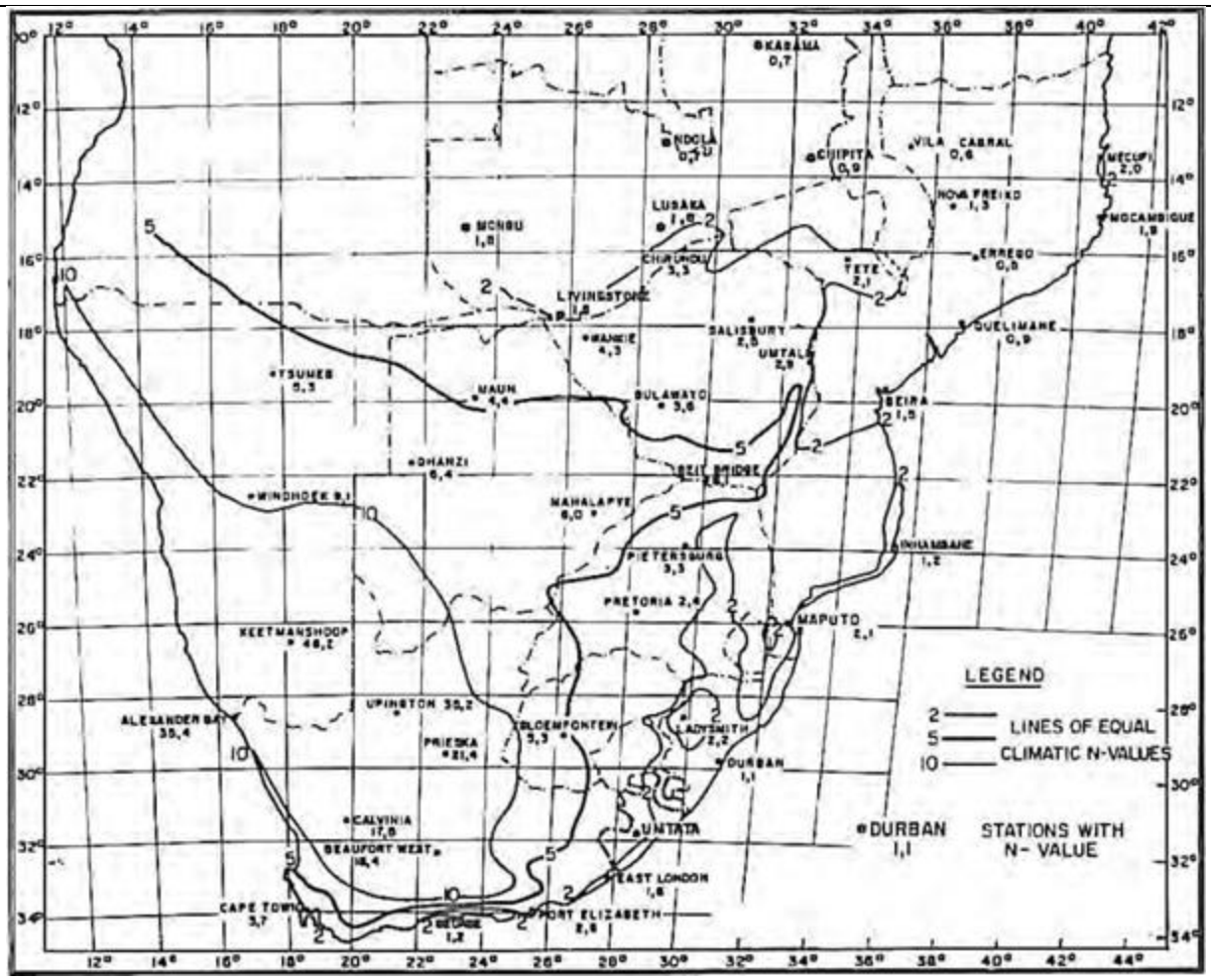


Figure 7: Contour map of climatic N-values for Southern Africa (Weinert, 1980).

3. Seismicity

The South African loading code, SANS 10160-4:2011 (SABS, 2011), suggests that the site is not located in a highly seismic hazard zone (**Figure 8**). However, as indicated in **Figure 8**, the site may nonetheless experience a peak ground acceleration in the order of 0.05g to 0.075g. The probability of exceedance of this peak ground acceleration is 10% in a 50-year period.

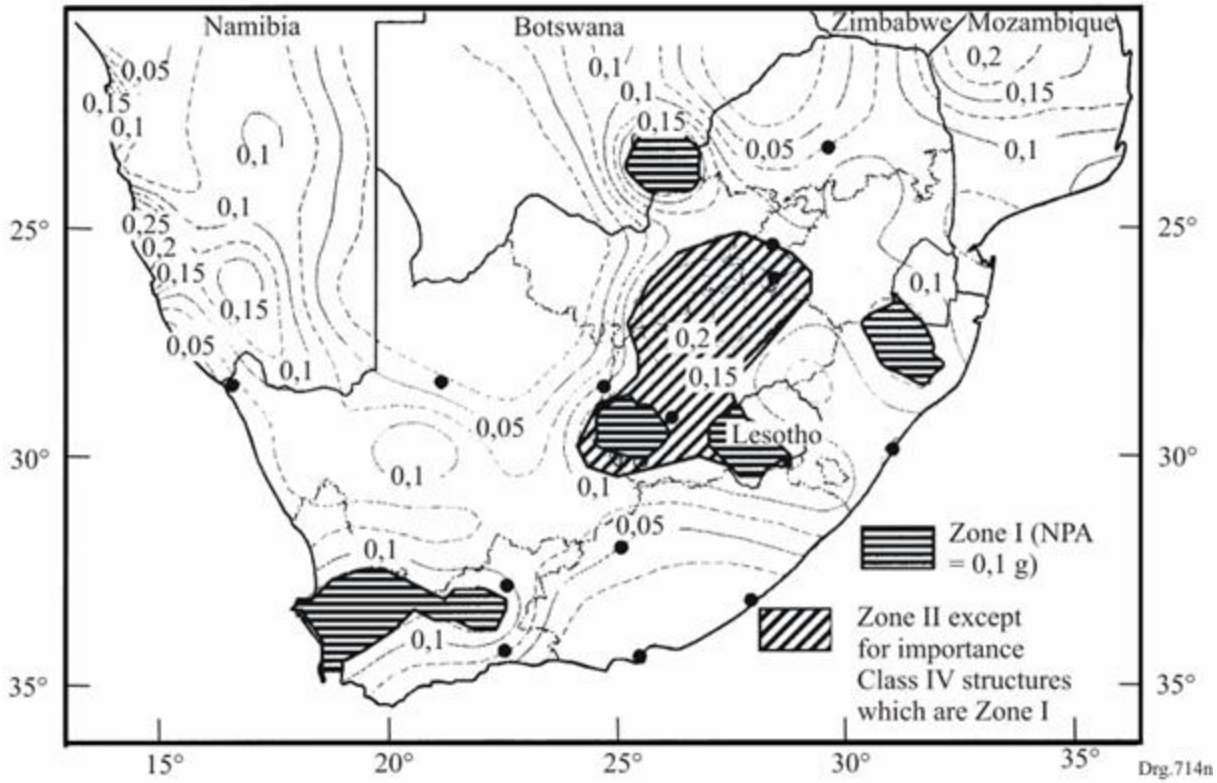


Figure 8: SANS 10160-4:2011 seismic hazard map of South Africa showing peak ground acceleration with 10% probability of being exceeded in a 50-year period (SABS, 2011).

4. Soil profile

The soils found within the region are generally associated with collapse however, the relatively thin layer at the proposed site limits the risk of such soils underneath the foundations.

5. Groundwater

WSM Leshika Consulting (2016) previously conducted a geotechnical investigation for the proposed Sekuruwe WTW. Eleven (11 no.) test pits were excavated, nine (9 no.) of which were within the current site boundary with two (2 no.) located just outside of the site boundary (**Figure 9**). The test pits were excavated with an excavator. According to the geotechnical investigations, no groundwater was encountered during excavation of the test pits and no indications of prolonged waterlogged conditions were identified during inspection of the test pits. However, the test pits were limited to a maximum depth of 2.4 m and the location of the groundwater table below this depth is unknown.

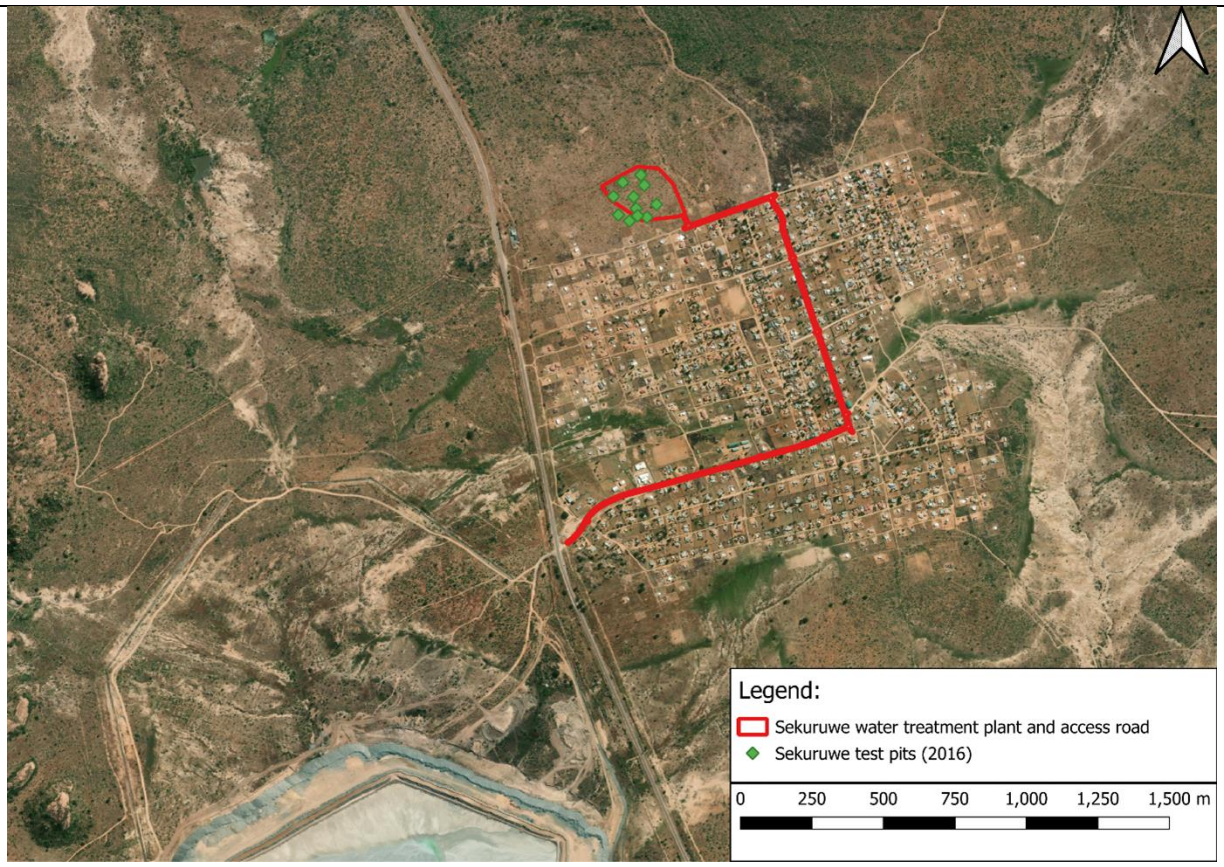


Figure 9: Test pit locations of previous geotechnical investigation study (QGIS Development Team, 2023).

B. Conclusions and Recommendations

From the published geology map of the region, the underlying geology of the proposed site is expected to comprise grey muscovite-biotite gneiss, and no potentially soluble rock like dolomite is present. Shallow test pitting from a previous geotechnical investigation at the water plant site encountered the presence of shallow granite rock, within approximately 0.5 m below ground level. This presents favourable conditions for founding of infrastructure, but difficult excavation conditions that may require blasting. The topography of the site is relatively gentle with an approximate slope of 3.7°, which may mitigate the amount of cut and fill that is required. Notwithstanding, from a geotechnical perspective, no fatal flaws that would inhibit the proposed development were identified at the site.

Given the presence of favourable ground conditions at the site, only limited additional geotechnical investigations may be necessary. The extent of additional investigations is however dependent on the details of the proposed infrastructure at the site, which were not available at the time of preparing the geotechnical document. For example, if deep excavations are required, the drilling of rotary core boreholes would be recommended to determine aspects such as the frequency and properties of discontinuities, details of which would be required for rock slope stability assessments. The extent of additional investigations, such as site walkovers with mapping of rock outcrops, excavating of test pits, drilling of rotary core boreholes, and laboratory testing, must be determined once the proposed infrastructure at the site is known. The quantity and extent of the geotechnical investigation will take into consideration the chosen site, the details of the infrastructure, and the stage of development, be it feasibility or concept design or detailed design.

3.2. AGRICULTURAL IMPACTS (JOHANN LANZ, 2023)

The agricultural compliance statement was compiled by Johann Lanz. The objective of an agricultural assessment is to answer the question: will the proposed development cause a significant reduction in agricultural production potential, and most importantly, will it result in a loss of arable land?

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of a development. The proposed development is negligible because it leads to no loss of potential cropland and negligible loss of future agricultural production potential. The site is classified as **low** to **medium** agricultural sensitivity by the screening tool (refer to **Figure 10**). This has been confirmed by the agricultural assessment, because of the agricultural production potential and current agricultural land use. The site is located in an area where there is no crop production. Cropping potential is limited by a combination of climate and soil constraints. The climate is classified as arid and therefore is limiting to rain-fed cropping. Soils are constrained by limited depth above the underlying rock. The climate and soil combination provides an insufficient moisture reservoir for viable rain-fed crop production and limits the land's agricultural potential to grazing only. Furthermore, factors other than climate and soil capability also constrain the potential of the property to practically deliver agricultural produce and therefore influence its agricultural production potential. The site is highly unlikely to ever be viably utilised for agricultural production and its potential is therefore assessed as low.

Figure 10: The development footprint overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). The screening tool's low to medium sensitivity is confirmed by this assessment.

The agricultural report revealed that the total footprint of land from which potential future agriculture will be excluded, is only approximately 3.9 hectares and it is not viable cropland. The loss of this amount of grazing land,

of which there is no particular scarcity in the country, will result in negligible loss of agricultural production potential in terms of national food security. The agricultural impact of the proposed development is therefore assessed as being of very low significance and acceptable. The specialist concluded and recommended that, from an agricultural impact point of view, the proposed development should be approved.

3.3. DEFENCE IMPACTS (PARIVISION, 2023)

The Defence compliance report was compiled by Hein Reid of Parivision.

The Defence Theme Impact Assessment for the proposed Sekuruwe WTW evaluates two distinct options: the preferred site which is examined for suitability and potential impact and the No Go alternative, examining the implications of not pursuing the project. This comprehensive evaluation aims to provide critical insights and recommendations for decision-makers and stakeholders in the Sekuruwe region regarding the defence theme for the project.

A. Summary of assessment of Site

Table 4 shows a summary of the assessment for the Site.

Table 4: Screening Tool Summary of the site assessment

Findings	The local habitat in this region falls under the Savanna Biome, it is characterized by the Makhado Sweet Bushveld (SVcb 20) as classified by Mucina and Rutherford in 2006. This specific vegetation type, Makhado Sweet Bushveld, is predominantly located in the Limpopo Province. It can be observed on the plains situated between the Soutpansberg Mountains to the north and the Waterberg region to the west.
Sensitivity	Medium
Sensitivity Features	Military and Defence site

B. Defence site sensitivity verification results

The Defence Site Sensitivity Verification process yielded the following key findings:

a. **Confirmation of Land Use and Sensitivity**: The desk-top analysis confirmed the environmental sensitivity of the Sekuruwe Site, consistent with the national screening tool's previous identification. (**Figure 11**). No Defence Installation or Facility is adversely impacted.
b. **No Disputes Detected**: The verification process did not uncover any disputes regarding the site's current land use or environmental sensitivity as identified by the screening tool.

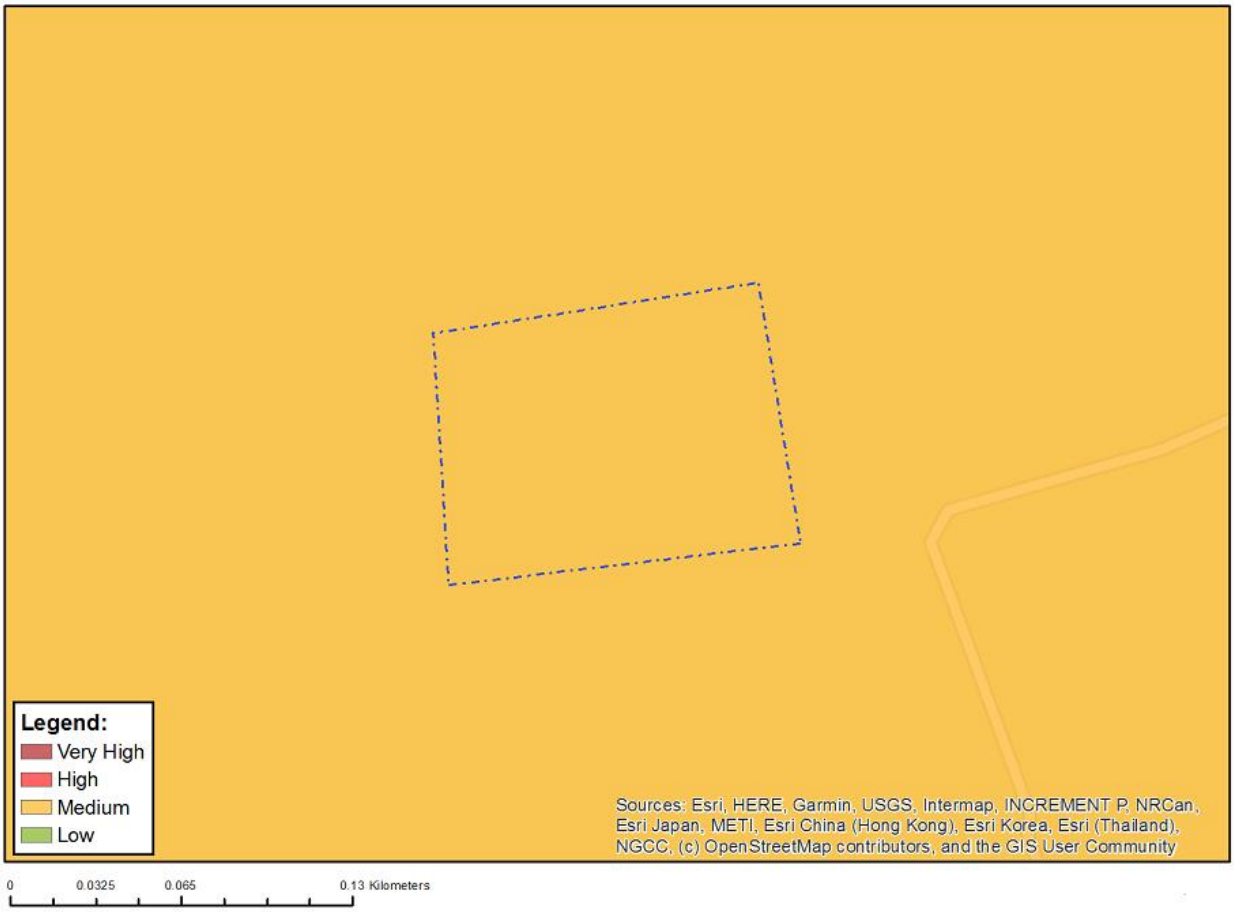


Figure 11: The development footprint overlaid on the defense sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). The screening tool's medium sensitivity is confirmed by this assessment.

C. No Go Option

While the "No Go" option may seem like a cost-saving measure or a way to avoid potential environmental impacts, it is likely not a feasible alternative for the Sekuruwe project. The region's water needs, economic considerations, environmental responsibilities, legal obligations, and long-term planning all point to the importance of proceeding with the project to ensure a sustainable and prosperous future for the community.

D. Conclusion and Recommendation

The specialist recommended that the Sekuruwe WTW proceeds at the Sekuruwe preferred site, alongside the necessary environmental assessments, themes, and reporting.

3.4. OBSTACLE LIMITATION SURFACE (OLS) AND CIVIL AVIATION IMPACTS (ZUTARI, 2023)

The Obstacle Limitation Surface (OLS) and civil aviation assessment was undertaken by Zutari (Pty) Ltd.

A. OLS Assessment

The OLS assessment revealed that the Sekuruwe site is situated at a distance at least greater than 30 km from any airspace or civil aviation air drone, therefore no foreseeable impact posed by the new proposed WTW.

B. Civil Aviation Assessment

The Civil aviation assessment revealed that the proposed site has a high sensitivity according to the DFFE screening tool (refer to **Figure 12).** It is to be noted that the specialist report does not cover airspace studies and only covers aerodrome infrastructure related to the Obstacle Limitation Surfaces.

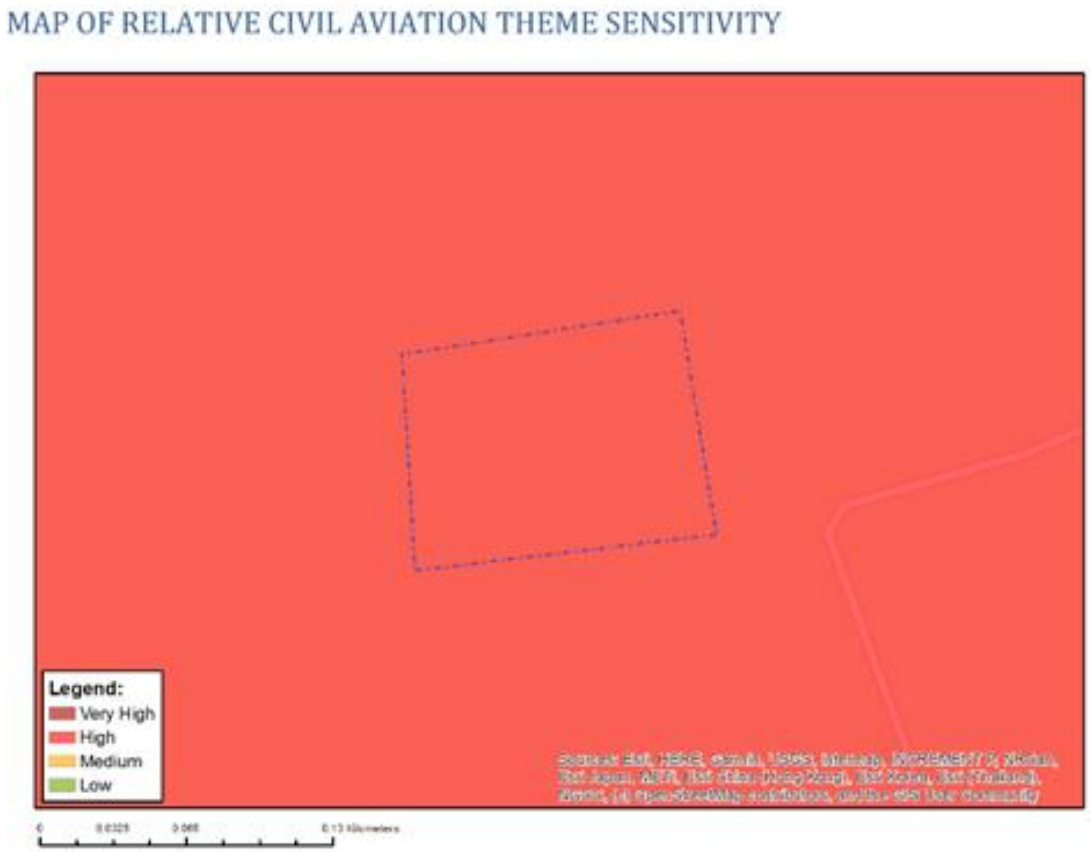


Figure 12: *Map of relative civil aviation theme sensitivity (green = low; yellow = medium; red = high; dark red = very high).*

Table 5 shows a summary of the assessment for the Site.

Table 5: Screening tool summary for Sekuruwe WTW

Sensitivity	Sensitivity Features	Mitigations of Identified Sensitivities
High	Dangerous and restricted airspace as demarcated	The nearest restricted / dangerous airspace is the Lowveld Information sector that provides flight information services to flights above 1500 feet (457,2 meters). This airspace is situated well above the intended structure (s).

C. Conclusions and Recommendations

No OLS protrusions are anticipated at Shikwaru Lodge airfield due to the distance, ~13.6 km, and the high-level OLS analysis conducted. The airspace is situated well above the proposed WTW; therefore no interference is foreseen.

3.5. HERITAGE IMPACTS (PGS HERITAGE, 2023)

A detailed archaeological and historical review of the project area and surrounding landscape was undertaken by PGS Heritage. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area.

A. Heritage Desktop findings

The desktop study revealed that a long and significant history characterises the surroundings of the study area. Additionally, previous archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites from the surroundings of the study area.

1. Heritage Screening

According to the screening report, the study area and surroundings are shown to have a Low Sensitivity in terms of archaeology and cultural heritage. Refer to **Figure 13** below.

According to the screening report, the study area and surroundings are shown to generally have a Medium Sensitivity in terms of palaeontology. Refer to **Figure 14**Error! Reference source not found. below.

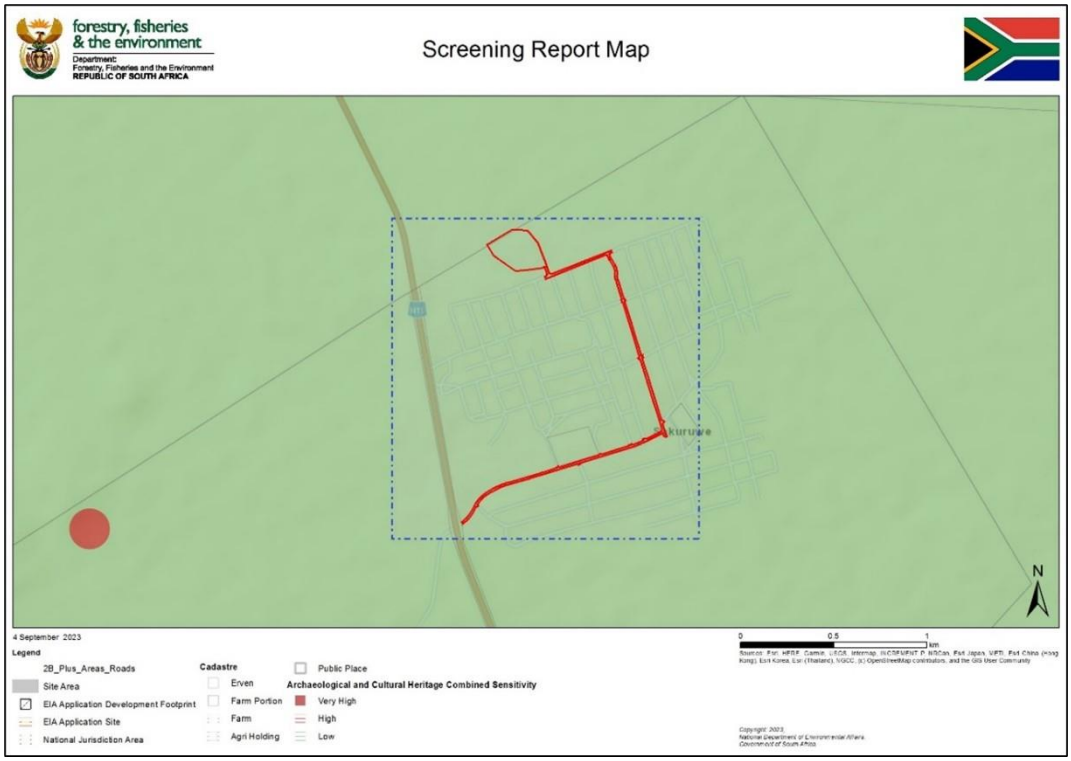


Figure 13: Screening tool map indicating a primarily low combined sensitivity rating for archaeology and cultural heritage for the study area. (green = low; yellow = medium; red = high; dark red = very high).

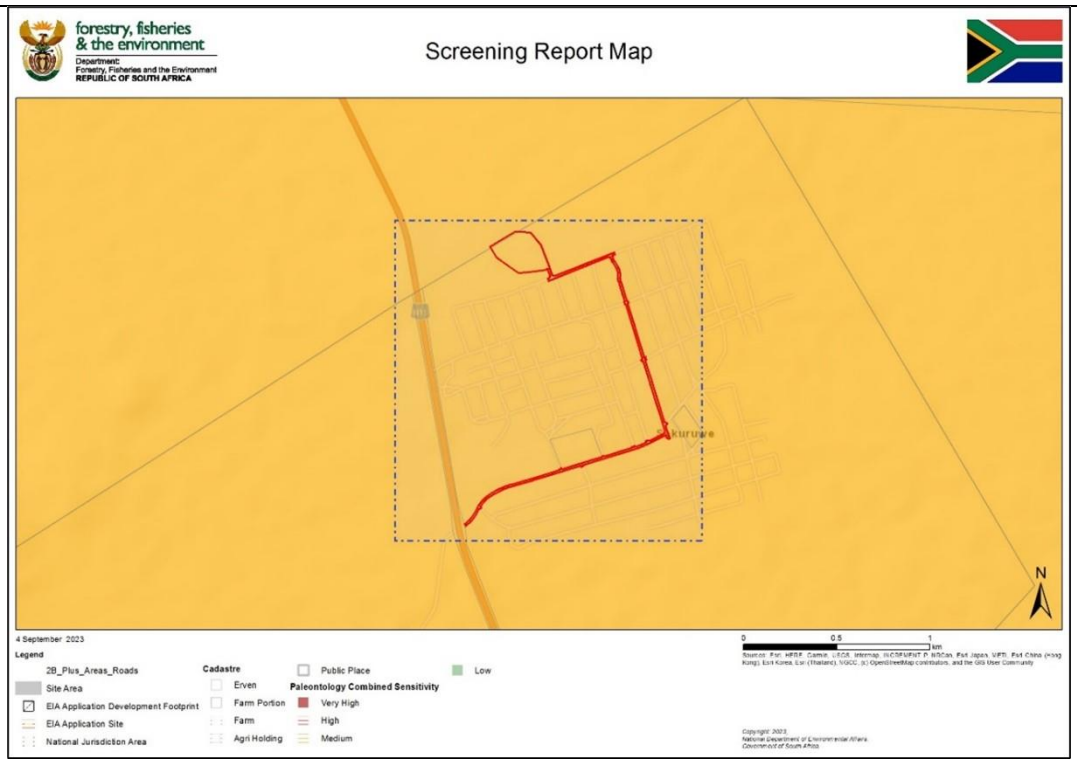


Figure 14: Screening tool map indicating a primarily low combined sensitivity rating for palaeontology for the study area and surroundings. (green = low; yellow = medium; red = high; dark red = very high).

B. Fieldwork findings

The fieldwork undertaken for this study aimed to identify tangible remains of archaeological, historical and heritage significance. It was undertaken by way of walkthroughs of the proposed development footprint areas and was conducted on Wednesday, 30 August 2023, by an archaeological fieldwork team comprising one archaeologist and two archaeological fieldwork assistants. Despite the intensive nature of the fieldwork undertaken for this project, no evidence for any heritage sites could be identified.

The Heritage Impact Assessment (HIA) report revealed that a few smaller areas within the Sekuruwe WTW had been fenced off by upright sticks (refer to **Figure 15, Figure 16** and **Figure 17)**. The areas within the fenced sections had been cleared of vegetation. It is possible that homesteads are planned here or alternatively that the area is earmarked for future ploughed fields. The fieldwork team did not enter the fenced areas. Generally, the proposed WTW footprint area is characterised by an open flat field with a few small shrubs and aloes. The area has recently been burned, and a lot of rubbish is scattered across the area.

Figure 15: General view of the Sekuruwe WTW footprint area, with residential housing, a water tower and cell phone mast visible in the background.

Figure 16: View along a section of fencing that was used to demarcate areas within the Sekuruwe WTW footprint. As can be seen on the left, these fenced areas were cleared of vegetation.

Figure 17: General view of a section of the Sekuruwe WTW footprint area that was not fenced.

C. Impact Assessment

As no heritage resources were identified during the fieldwork, no impact on identified heritage resources could be assessed. Additionally, the subterranean characteristics of some heritage features and archaeological sites, including unmarked graves, means that it is always possible that the fieldwork findings made in this report do not completely represent the complete archaeological and heritage fabric from the study area.

The following impact risk, as shown in **Table 6** below, can therefore be identified:

Table 6: Assessment of the Impact on Presently Unknown Heritage Resources

Project phase	**Construction**	
Impact	**Impact on Presently Unknown Heritage Resources**	
Description of impact	**Destruction / Damage to Presently Unknown Heritage Resources**	
Mitigatibility	High	Mitigation exists and will reduce the significance of impacts
Potential mitigation	An archaeological watching brief must be implemented during the construction phase. This watching brief is aimed at monitoring the construction and excavation work for any archaeological deposits and features which may be exposed during these development activities.	
Assessment	**Without mitigation**	**With mitigation**
Nature	Negative	Negative
Duration	Long-term	Medium-term
Extent	Regional	Regional
Intensity	High Negative	Moderate Negative

Consequence	Highly detrimental	Moderately detrimental
Probability	Fairly likely, i.e. could happen	Unlikely
Significance	**Moderate - negative**	**Low - negative**

The impact assessment undertaken in **Table 6** above has revealed that the significance of the unmitigated impact risk in terms of the destruction of presently unknown heritage resources is expected to be of **Moderate (Negative) Significance**. The assessment has also indicated that the impact risk is expected to be of **Low (Negative) Significance once mitigation is completed**. This calculation clearly indicates that mitigation would be required.

In this instance, the term 'presently unknown heritage resources' refers to archaeological and heritage sites that were not identified during the fieldwork. This may have been due to the subterranean characteristics of some heritage and archaeological sites coupled with the fact that not the entire footprint area could be assessed during the fieldwork.

The specialist concluded the following: on the condition that the general recommendations and mitigation measures outlined in the HIA report are adhered to and in cognisance of the assumptions and limitations contained in the HIA report, no heritage reasons can be given for the development not to continue.

3.6. PALAEONTOLOGICAL IMPACTS (BANZAI ENVIRONMENTAL, 2023)

Banzai Environmental was commissioned, by PGS Heritage, to conduct the Palaeontological Desktop Assessment (PDA). This PDA is required to confirm whether fossil material may potentially be present in the planned development area and to assess the potential impact of the proposed development on the local palaeontological heritage in order to comply with the NHRA (section 38).

A. Geological and Palaeontological History

The geology of the proposed Sekuruwe WTW is indicated on the 1:250 000 Pietersburg 2328 (1985) Geological Map (Council for Geosciences, Pretoria**) (Figure 18, Table 7** and **Table 8).** The proposed development is underlain by the Goudplaats Gneiss Suite. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the Goudplaats-River Gneiss Suite has a Palaeontological Sensitivity of Zero (grey) (**Figure 19**). The geology has been updated (Council of Geosciences, Pretoria) and confirms that the Goudplaats-River Gneiss Suite underpins the research region (**Figure 20**).

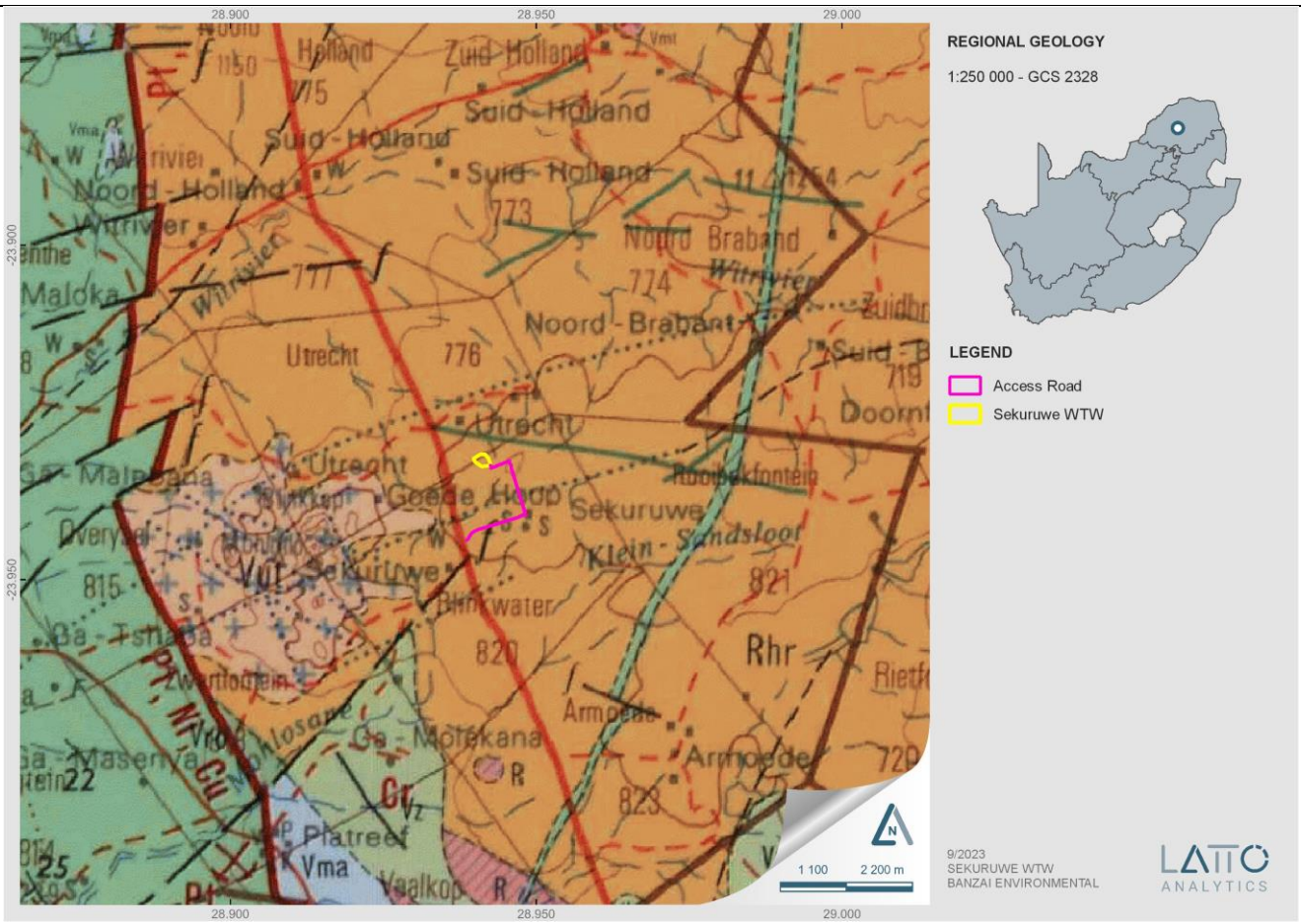


Figure 18: Extract of the 1:250 000 Pietersburg 2328 (1985) Geological Map (Council for Geosciences, Pretoria) indicating that the proposed is underlain by the intrusive rocks of the Goudplaats Gneiss Suite.

Table 7: Legend of the Pietersburg 2328 (1985) Geological Map (Council for Geosciences, Pretoria). Rock Formations present in the study area is indicated in a red polygon.

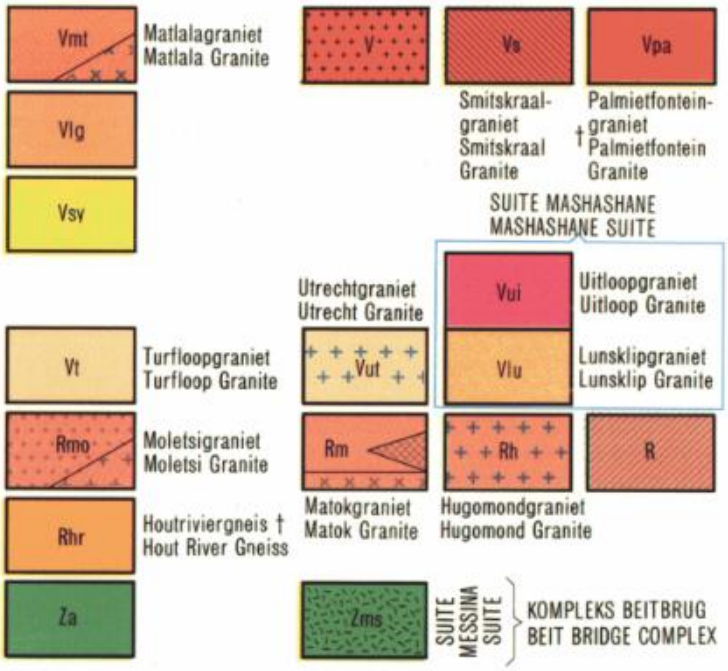


Table 8: Extract of the Palaeotechnical Report of the Limpopo (Groenewald, et al., 2014).

Group / Complex / Belt	Formation	Lithology	Fossil Heritage	Comment
ARCHAEAN GRANITE-GNEISS BASEMENT	LIMPOPO BELT Beit Bridge Complex, Modipe Complex (Zmo, Zma, Zgu) Hout River Gneiss (ZRh) Goudplats Gneiss (Zgo; Zgh) Z23; Z26; Zme; Zmd; Zmd2; Zmd3; Zmd4; Zgu3; Zgu4; Zgu5; Zgu6; Zme1; Vpl; M24; M21; Vkd; Zmp; Z57; Z58; V10; Z56; Zmk; V1; Z1; Z54.	Intrusive granitoids, gneisses, migmatites Early to Late Archaean (3.6 –2.4 Ga) (Swazian / Randian) Basic (and ultrabasic?) intrusive rocks (gabbro, etc.).	No fossils recorded.	These ancient rocks build one of the oldest surviving blocks of continental crust (Kaapvaal Craton) The famous Sand River Gneisses of the Limpopo Belt near Messina (National Monument) are spectacular examples of highly metamorphosed early crustal rocks (3.4 to 3.2 Ga).

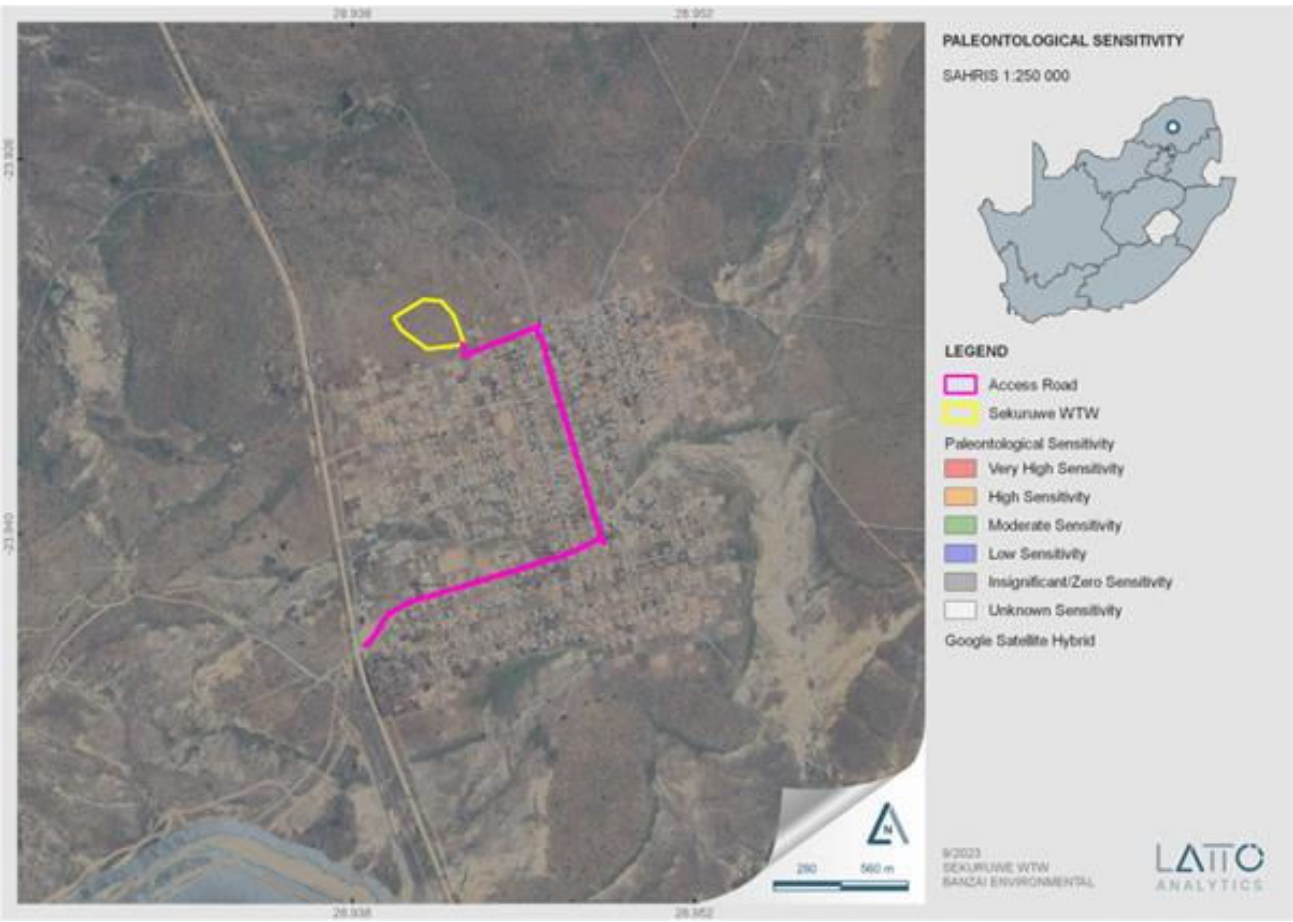


Figure 19: Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the study area is underlain by sediments with a Zero (grey).

Table 9: Palaeontological Sensitivity according to the SAHRIS PalaeoMap (Almond et al, 2013; SAHRIS website

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study; a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	**INSIGNIFICANT/ZERO**	**No palaeontological studies are required**
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

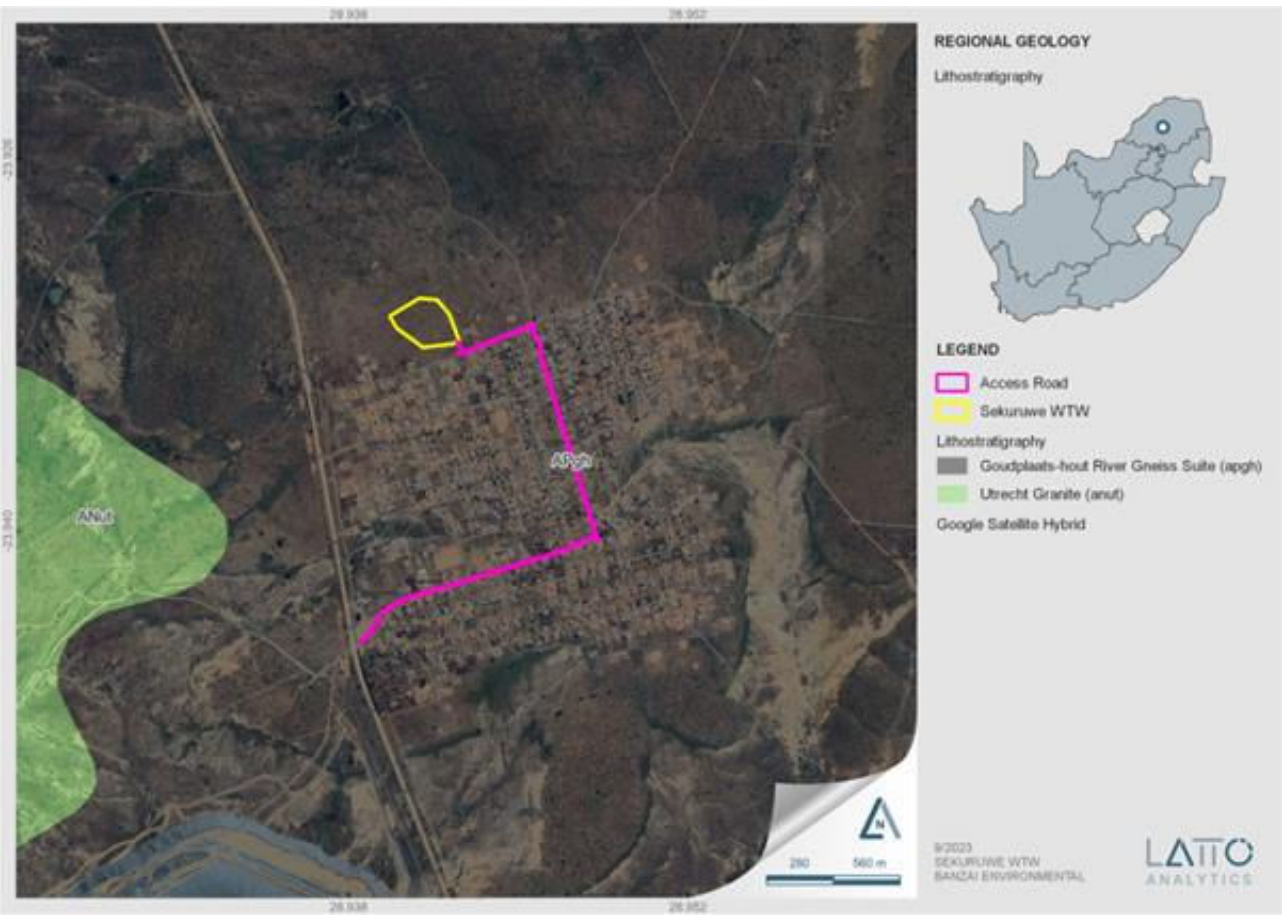


Figure 20: Updated Geology (Council of Geosciences, Pretoria) of the proposed Sekuruwe Water Treatment Works indicates that the development is underlain by the Goudplaats-hout River Gneiss Suite (apgh).

B. Sensitivity rating

The SAHRIS PalaeoMap as well as the DFFE Screening Tool indicates that the proposed development has an Overall **low** Palaeontological Sensitivity (refer to **Figure 20** and Figure 21).

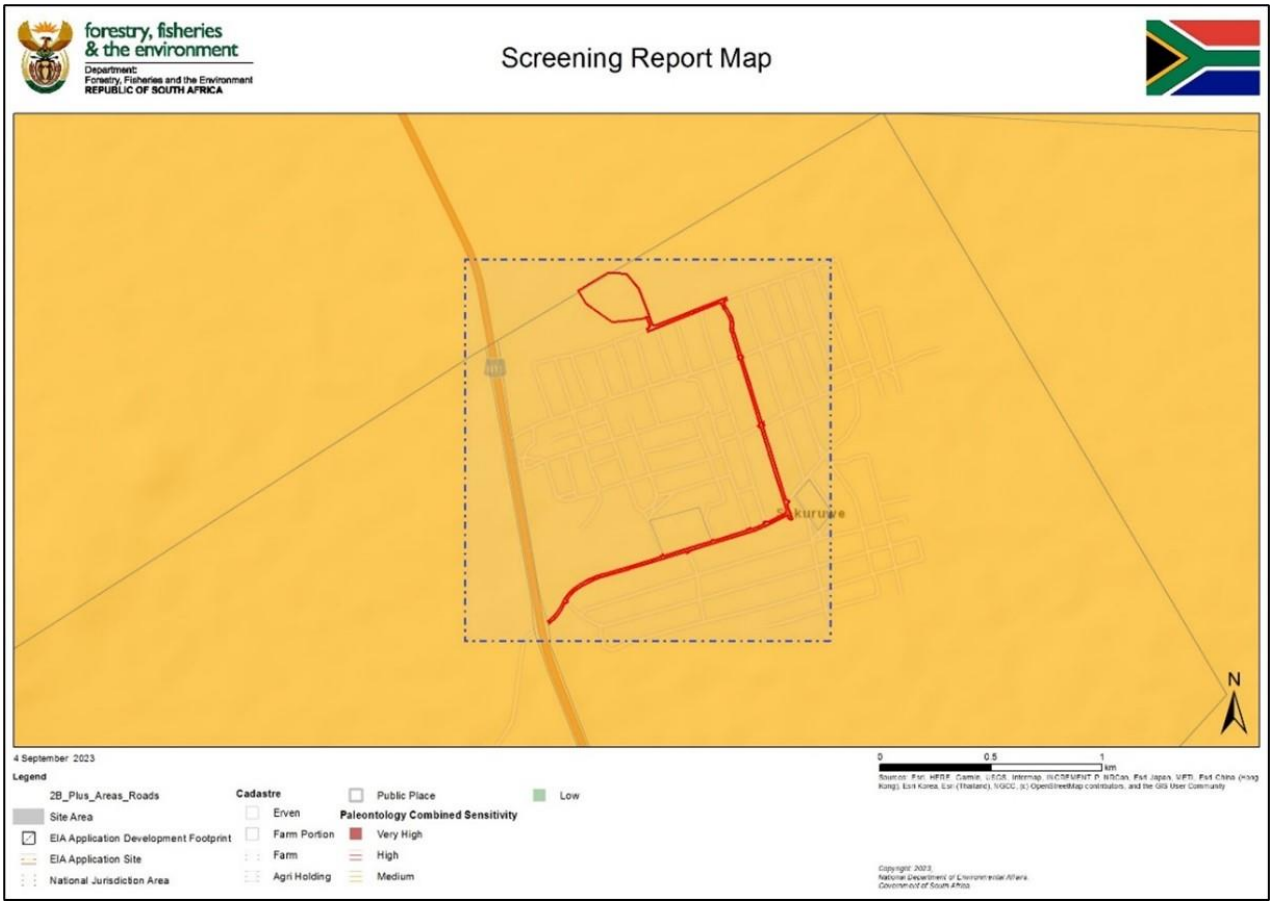


Figure 21: Screening tool map indicating a primarily low combined sensitivity rating for palaeontology for the study area and surroundings. (green = low; yellow = medium; red = high; dark red = very high).

C. Impact Assessment Methodology

Table 10: Construction Impact on Presently Unknown Fossil Heritage Resources

Project phase	**Construction**	
Impact	**Impact on Presently Unknown Fossil Heritage Resources**	
Description of impact	**Destruction / Damage to Presently Unknown Heritage Resources**	
Mitigatibility	High	Mitigation exists and will reduce the significance of impacts
Potential mitigation	If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the ECO in charge of this development must be informed. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.	
Assessment	**Without mitigation**	**With mitigation**
Nature	Negative	Negative
Duration	Long-term	Long-term
Extent	Site	Site
Intensity	Negligible	Negligible
Consequence	Negligible	Negligible

Probability	Very unlikely	Very unlikely
Significance	**Very Low - negative**	**Very Low - negative**

C. FINDINGS AND RECOMMENDATION

A **low** Palaeontological Significance has been allocated to the development footprint. It is therefore considered that the proposed development will not lead to damaging impacts on the palaeontological resources of the area. The construction of the development may thus be permitted in its whole extent, as the development footprint is not considered sensitive in terms of palaeontological resources.

The specialist further advised that if fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations, the Environmental Control Officer (ECO) in charge of these developments must be informed. These discoveries ought to be protected and the ECO must report to SAHRA so that mitigation can be carried out by a paleontologist. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.

3.7. HYDROLOGICAL IMPACTS (ZUTARI, 2023)

This hydrological Impact Assessment was undertaken by Zutari (Pty) Ltd. A site visit was undertaken in late August 2023. This involved a visual inspection of the hydrological factors and other parameters pertinent to the study. The aim of this was to ground truth the information available from the desktop study and ensure hydrological factors are interpreted correctly.

A. Site Visit Findings

A water tower is located on a site to the east of the proposed WTW (refer to **Figure 22**) which makes the location convenient from an infrastructure point of view. The site vegetation is scrubby grassland (**Figure 23)** and a shallow sandy topsoil cover with granite rock outcroppings (**Figure 24**). The site slopes to the north, away from the Sekuruwe village and there is a flow path outside the eastern boundary of the site draining northwards (**Figure 25)**. It should be noted that the site is being demarcated by residents in the area for new houses (**Figure 26**) – which does not affect the Hydrology Impact Assessment.

Figure 22: Nearby water tower infrastructure

Figure 23: Scrubby grassland vegetation with paths

Figure 24: Rocky outcrop on the site

Figure 25: Flow path on the eastern boundary of the proposed site

Figure 26: Demarcation starting on the proposed site

B. Hydrological Study

Onsite Rainfall Determination

The design rainfall for the 1:100-year RI event was extracted from the Design Rainfall estimation tool by Smithers and Schulze (2002). The location of the rainfall stations is shown in **Figure 27** and the station information is summarised in **Table 11**. Based on the location of the catchments and proposed Sekuruwe WTW site, the 1-day gridded design rainfall value of 142.9 mm has been selected to represent the 1:100-year RI rainfall.

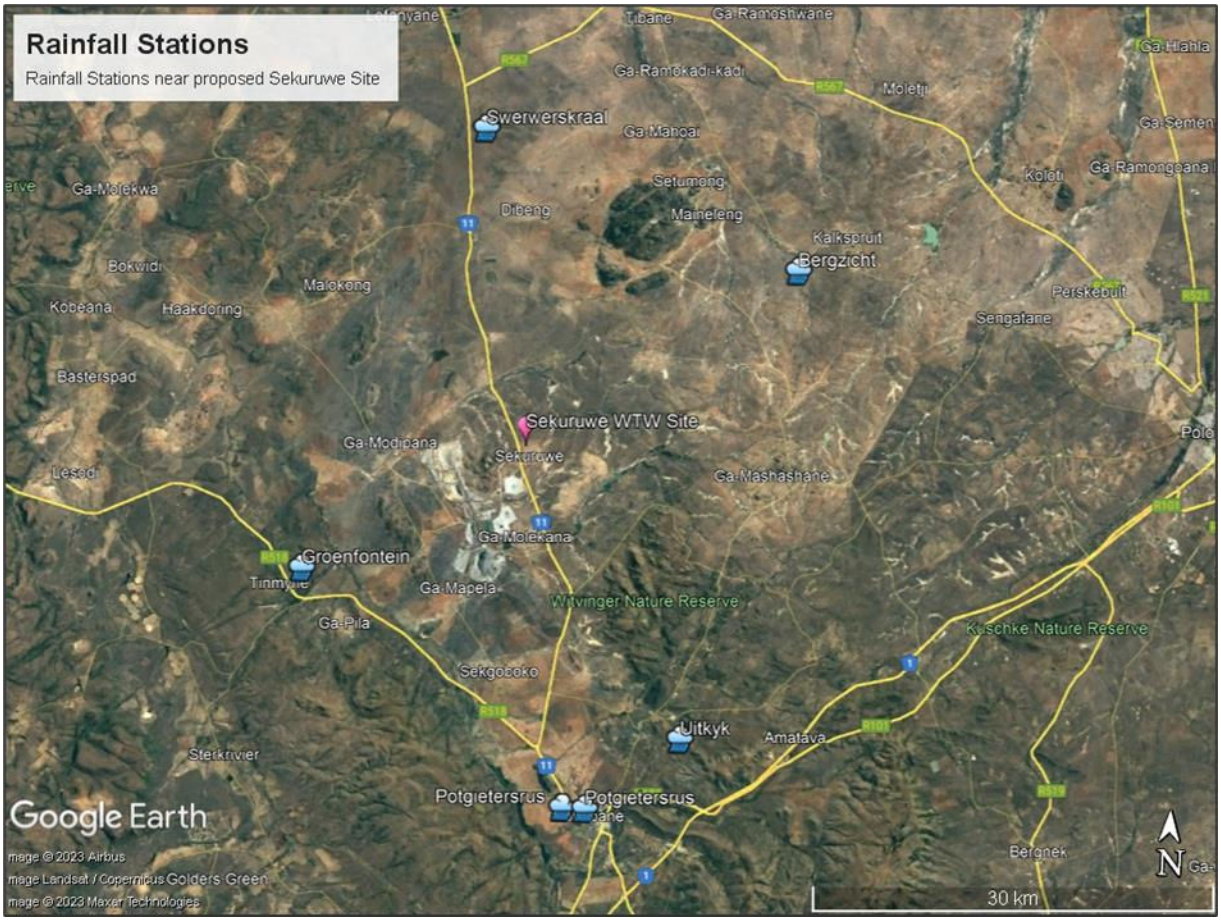


Figure 27: Location of rainfall stations near proposed Sekuruwe Site

Table 11: Design Rainfall Estimation tool rainfall stations near proposed Sekuruwe Site

Station Name	Distance to Site (km)	Record Length (years)	Latitude	Longitude	1:100-year 1-day Rainfall (mm)
GROENFONTEIN	19.5	46	24°2' S	28°47' E	181.2
SWERWERSKRAAL	21.9	52	23°44' S	28°54' E	137.9
BERGZICHT	25	78	23°49' S	29°8' E	126.1
UITKYK	26	40	24°8' S	29°4' E	161.2
POTGIETERSRUS	27.5	90	24°11' S	28°59' E	136.4
POTGIETERSRUS	27.9	94	24°11' S	29°0' E	144
Proposed Sekuruwe Site			**23°56' S**	**28°56' E**	**142.9**

Site Catchment Delineation

Flow paths and watercourse catchments were delineated using QGIS and 5m contour information. The catchments and longest flow paths are shown in **Figure 28**. The catchment characteristics are summarised in **Table 12** and were used to determine the design flood peaks for the 1:100-year RI event.

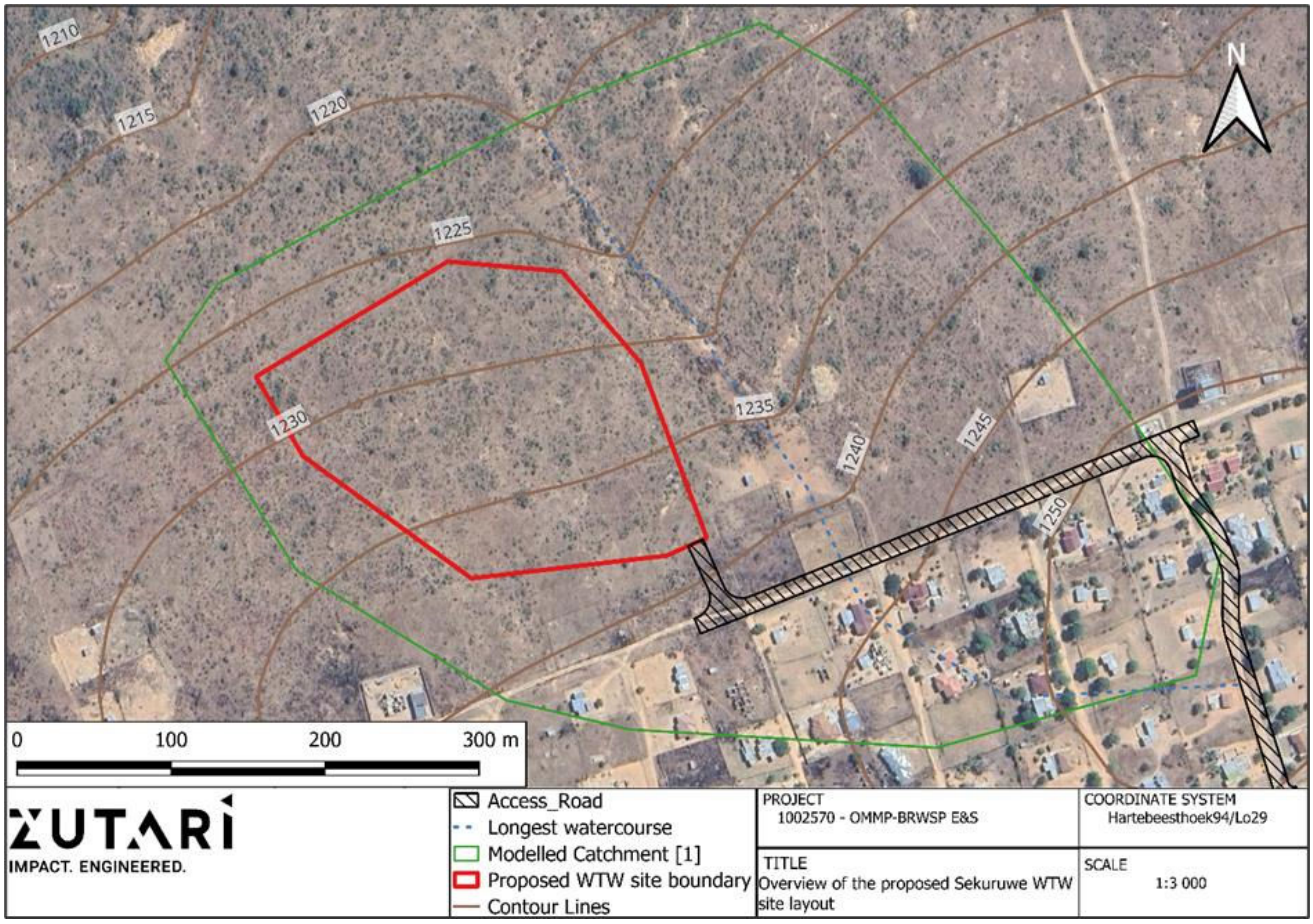


Figure 28: Delineated catchments and longest flow paths

The site is located near the top of a catchment. Only a portion of the site contributes to the drainage path on the eastern side of the catchment (**Figure 25**), the delineated catchment for this flow path is shown in **Figure 28**. The remainder of the site does not have a defined drainage path and therefore does not contribute to a flood line that would affect the site.

Table 12: Physical catchment characteristics for the proposed Sekuruwe Site

Catchment	Area (km²)	Longest Watercourse (km)	10-85 Slope (m/m)
1	0.20	0.56	0.07

C. Hydraulic Study

Onsite Runoff

The rational method was used for design flood determination. This is a widely accepted deterministic method for design flood determination for small catchments. The rational method inputs are summarised in **Table 13**, along with the design flood peaks (highlighted) used as inputs into the HEC-RAS model.

Table 13: Rational method input values for the proposed Sekuruwe Site

Catchment	C-value	Time of Concentration (hours)	D-factor (hours)	Average rainfall intensity (mm/hr)	1:100-year RI flood peak (m³/s)
1	0.410	0.12	0.24	344.5	7.8

Flood Line Determination

A high-resolution LiDAR DEM was created from the 5m-interval CDNGI contours. A HEC-RAS 2D model of the proposed WTW site was configured using the US Army Corps of Engineers HEC-RAS 2D version 6.2. This is a widely used and industry standard hydraulic modelling software package.

The 2D mesh was set to 10 m by 10 m but refined to 5 m x 5 m along the delineated watercourses. The watercourse centrelines were defined as breaklines to align the flow direction. Upstream boundaries were defined as the model flood peaks and the downstream boundary conditions were set as the "normal depth". The roughness value for the river and overbank was set to 0.04 and 0.07 respectively, as per guidance in the HEC-RAS Reference Manual.

The model limitations include:

- Only a single, deterministic method was used for design flood determination.
- Assumed Manning Roughness coefficient based on satellite imagery and a site inspection.

Figure 29 shows the modelled 1-100-year flood line on the Sekuruwe site.

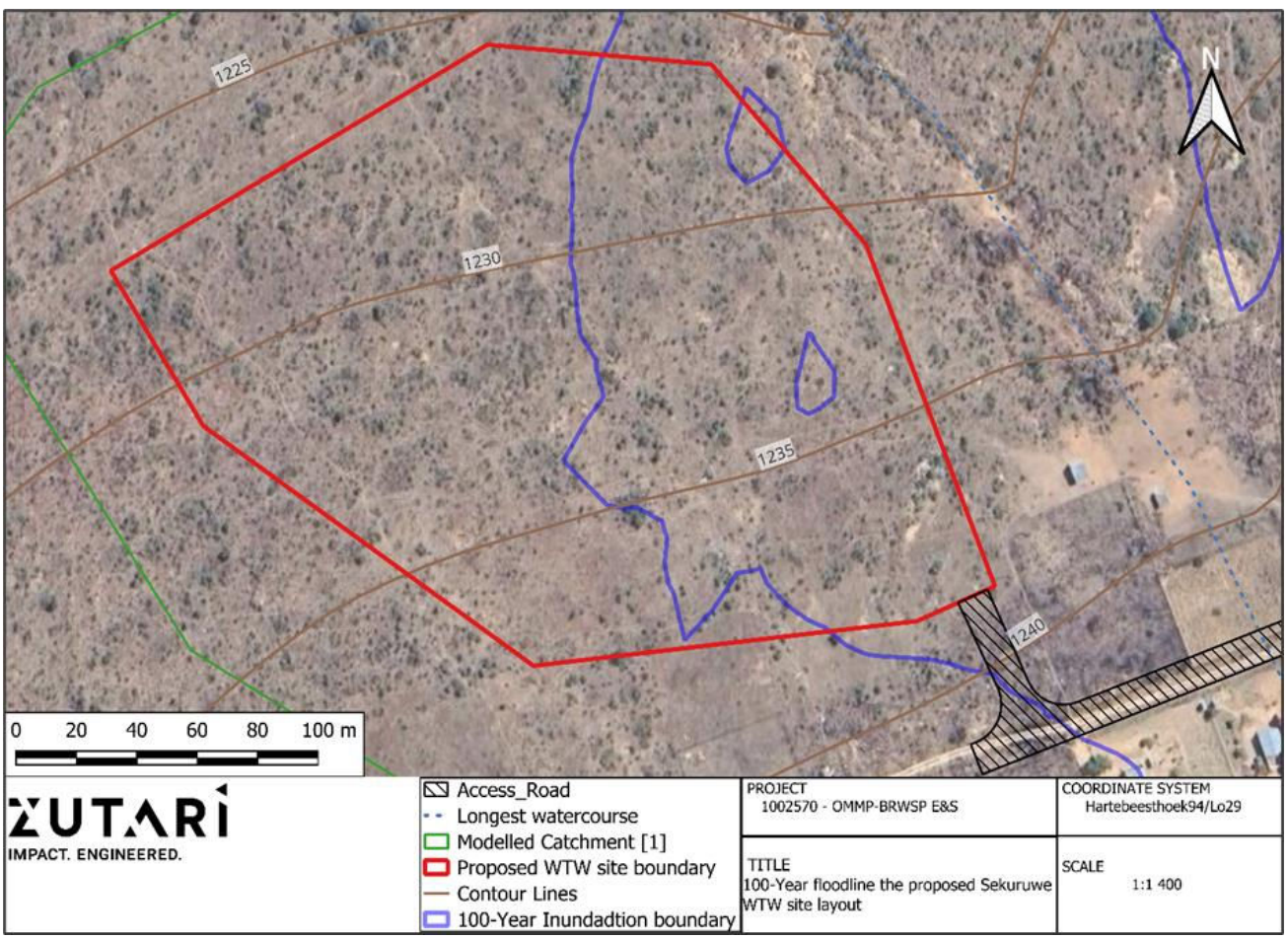


Figure 29: 1-100-year flood line on the Sekuruwe site

D. Surface Water Impacts and Mitigations

Based on the findings of this study, the following can be recommended to reduce the risk of flooding from the watercourses at the Sekuruwe WTW site:

- The design and construction of a rip-rap, gabion or earth channel (dependent on channel slope and design flow velocity) along the watercourse to better control the discharge and reduce the lateral inundation at areas of concern.
- Reshape the flow path to define shallow slopes and plant with appropriate vegetation.
- A flood risk assessment should be compiled using the designed channel and reshaped flow path to determine the lateral extent of the 1-100-year flood. It is recommended that the footprint of the WTW does not extend into the remodelled flood line.
- Install berms and cutoff drains on the upstream edge of the proposed WTW building and road footprints to divert runoff and protect from flooding.
- Infiltration testing should be conducted as part of the geotechnical investigation to assess the suitability of designing and installing infiltration-related sustainable drainage systems to manage stormwater runoff generated by the developed site.
- During construction there must be erosion and sedimentation controls in place to mitigate erosion risk and damage to topsoil and vegetation.
- The design of the stormwater management system should use water sensitive design principles and mimic the natural run-off volume and quality as closely as possible.

E. Conclusion and Recommendations

According to the Hydrology Impact Assessment report, it is recommended that a flood risk assessment be compiled in conjunction with a stormwater management plan to determine the impact to on-site runoff of developing a WTW on the site.

The following recommendations are made based on the findings of the Hydrology Impact Assessment report and municipal standards for the design of the stormwater management system:

- Provision for attenuation of stormwater will need to be made within the site and attenuation or infrastructure will not be permitted within the 1:100-year flood line or within the delineated wetland or riparian zone or associated buffers.
- A stormwater management plan must be submitted for approval by the relevant authorities prior to construction approval. The plan must meet the following standards:
  - Peak discharge must not increase for any event of any duration up to the 25-year RI event.
  - Volume of runoff must not increase up to the annual 10-year rainfall.
  - No surface runoff for the 1-year RI event of any duration
  - No deterioration of water quality.
- The stormwater management plan and design should meet the following objectives:
  - Reproduce as closely as possible the hydrological conditions at the point of discharge that existing prior to the development of the site.
  - Provide for removal of most urban pollutants.
  - Have a neutral to positive impact on the natural and human environment.
- The stormwater management plan should also minimise the generation of surface runoff and stormwater through adopting the principles of Water Sensitive Urban Design (WSUD) and Sustainable Urban Drainage Systems (SUDS). The WSUDs and SUDS can be used to manage the impacts of urban development of the water cycle as an alternative or supplement to traditional 'end of pipe' techniques, and typically include techniques relating to stormwater conveyance, receiving water protection, and water usage and recycling, to reduce the negative impacts or urban development on the water cycle.
- To minimise surface runoff and to maintain water quality, consideration should be given to:
  - The use of bioretention ponds,
  - Enhances swales and grass lined channels,

- Stone fille infiltration ditches (dependent on geotechnical investigation and the lack of dolomite), and,
- Permeable paving.

- The layout and associated stormwater management plan should optimise opportunities for linking the water cycle and integrating engineering, water conservation, and greening through:
  - Capturing of runoff of for re-use,
  - Natural irrigation and links to landscaping, and,
  - The use of natural plant filters.
- Stormwater management must seek to recharge natural underground water systems and the discharge of runoff must take place as close to the point of interception as possible. In addition, single discharge points must be avoided in favour of multiple discharge systems to achieve more natural flow.

3.8. AQUATIC IMPACT ASSESSMENT (SCIENTIFIC AQUATIC SERVICES, 2023)

Scientific Aquatic Services (SAS) (Pty) Ltd was appointed to conduct a freshwater ecological assessment as part of the EA process for the proposed WTW and associated access road. In line with the specialist report requirements for the assessment and reporting of impacts on aquatic biodiversity in terms of Government Notice 320 as promulgated in Government Gazette 43110 of 20 March 2020, a compliance report has been compiled as the proposed development is not located within any areas of very high freshwater / aquatic biodiversity sensitivity.

The area of assessment consists of the development site of the WTW (the 'study area'), along with a 500 m "zone of investigation" (the investigation area), in accordance with Government Notice (GN) 509 of 2016 as it relates to the NWA (refer to **Figure 30** and **Figure 31** below).

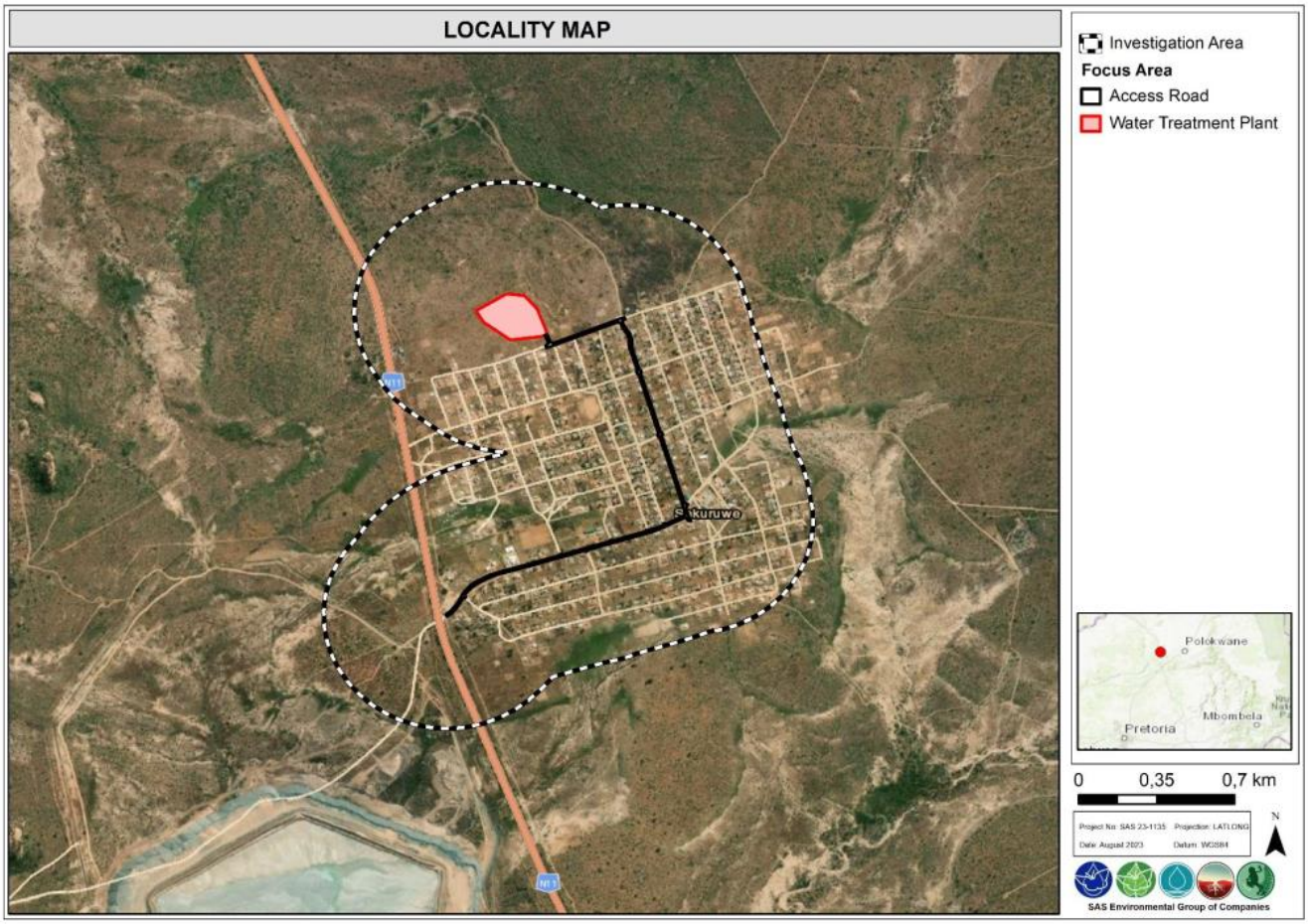


Figure 30: Digital satellite image depicting the location of the proposed Sekuruwe WTW study area and associated investigation area in relation to

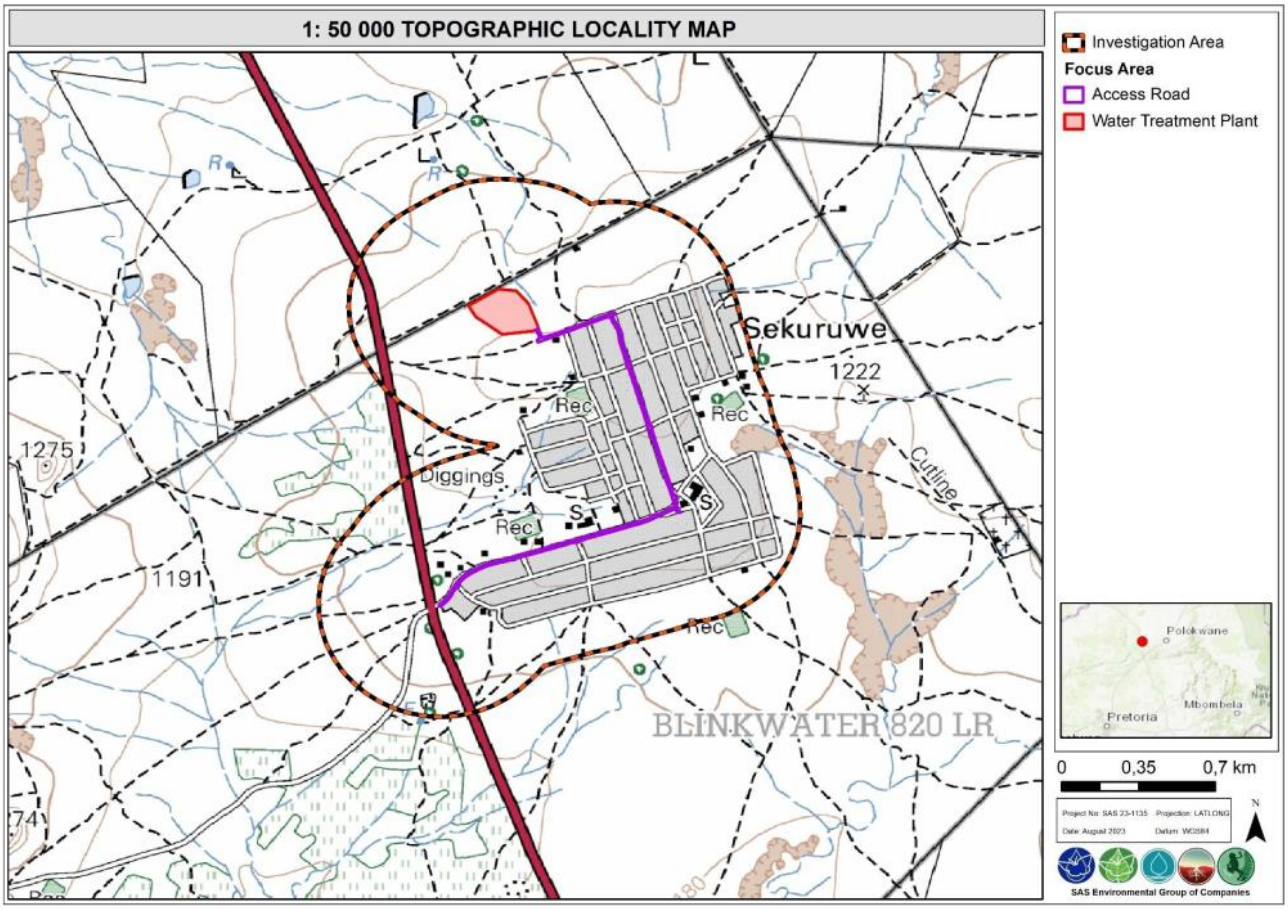


Figure 31: The proposed Sekuruwe WTW, and associated investigation area depicted on a 1:50 000 topographical map in relation to the surrounding.

A. Freshwater Ecosystem Site Verification

A field-based assessment of the study and investigation areas was undertaken in late August 2023 (late winter season) to identify any freshwater occurrence and potential impacts of the proposed development on the freshwater environment. An episodic drainage line (EDL) was identified to the north-east of the study area, draining northwards through the investigation area. Three other EDLs were identified in the investigation area of the proposed access road.

B. Findings of the DFFE Screening Tool

According to the environmental screening tool, the entirety of the study area and the investigation area is located within an area of **low** aquatic / freshwater biodiversity significance (**Figure 32**).

Figure 32: Map of relative aquatic biodiversity according to the Web-based DFFE Screening Tool, indicating 'low' sensitivity for the study and investigation areas.

As detailed in Section 6 of the compliance statement, certain freshwater ecosystems were confirmed to occur in the investigation area, including an EDL located in relatively close proximity to the north-eastern edge of the WTW development site. No freshwater ecosystems are located within the footprint of the Sekuruwe WTW development site or along the access road. Accordingly, as only indirect impacts are likely to be able to be generated and due the physical characteristics of the freshwater ecosystems – i.e., their episodic nature as first order drainage lines, the proposed development will be unlikely to pose a high risk to the regional aquatic biodiversity or freshwater ecosystems in the area. Accordingly, the sensitivity assigned to the study and investigation areas is not disputed and the assessment approach of undertaking an Aquatic Biodiversity Compliance Statement has been undertaken.

C. Desktop Investigation Findings

The findings below were revealed by the desktop investigation:

- The study area is located within an Upstream Management Catchment which is required to prevent the downstream degradation of Freshwater Ecosystem Priority Areas (FEPAs) and Fish Support Areas (FSAs).
- The study area and investigation area are characterised by the Ae335 land type. Ae land type groupings consist of red and yellow, freely drained apedal soils of the Hutton, Griffin and Clovelly soils occupying more than 40% of the landscape. Deeper (> 300 mm, but generally 500 to 1 000 mm) red soils of the Hutton form are dominant. Mispah and Glenrosa soils usually occupy significant proportions of the landscape. Soils with neocutanic, plinthic, duplex horizons and shallow black clay soils may occupy small proportions of the landscape. Katspruit, duplex soils and black clay soils usually occupy bottomland terrain positions with streambeds and erosion.

- **NFEPA Wetlands:** According to the NFEPA Database, there are no wetland features located within the study area and investigation area.
- **Wetland Vegetation Type (Figure 33):** The majority of the study area and investigation area is situated within the Central Bushveld Group 6 Wetland Vegetation Type, considered Critically Endangered as provided by Mbona et al. (2015). The remaining southern portion of the investigation area is situated within the Central Bushveld Group 4 Wetland Vegetation Type, considered Vulnerable.
- **NFEPA Rivers**: According to the NFEPA Database, no rivers occur within the study or investigation areas. The closest river is an unnamed tributary of the Mogalakwena River approximately 6 km to the south. The unnamed tributary is considered moderately modified (Class C) and an upstream management river.
- **National Biodiversity Assessment (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE):** According to the NBA SAIIAE (2018) database, there are no wetland features located within the study and investigation areas, corresponding with the NFEPA Database. The NBA Database corresponds with the NFEPA Database, with regards to the unnamed tributary of the Mogalakwena River. The Ecosystem Threat Status (ETS) of the river is critically endangered (CR) and the Ecosystem Protection Level (EPL) is Poorly Protected (PP).
- **Strategic Water Source Areas (SWSA, 2017) for groundwater or surface water:** The study area and investigation area is not situated within a Strategic Water Source Areas (SWSA).
- **Limpopo Conservation Plan (C-Plan, 2018); Figure 34):**
    - The entire WTW plant and small sections of the access road are located within an area considered to be other natural areas (ONAs). These are natural and intact areas but are not required to meet targets, nor have they been identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). No management objectives, land management recommendations or land-use guidelines are prescribed. Where possible existing “Not Natural” areas should be favoured for development before "ONAs".
    - Most of the access road is located within areas considered to have No Natural Habitat Remaining. These are areas with no significant direct biodiversity value. These are either not natural areas or degraded natural areas that are not required as ESA. These areas include intensive agriculture, urban, industry, and human infrastructure. These areas are nevertheless subject to all applicable town and regional planning guidelines and policy. No management objectives, land management recommendations or land-use guidelines are prescribed. Where possible existing “Not Natural” areas should be favoured for development before "ONAs".

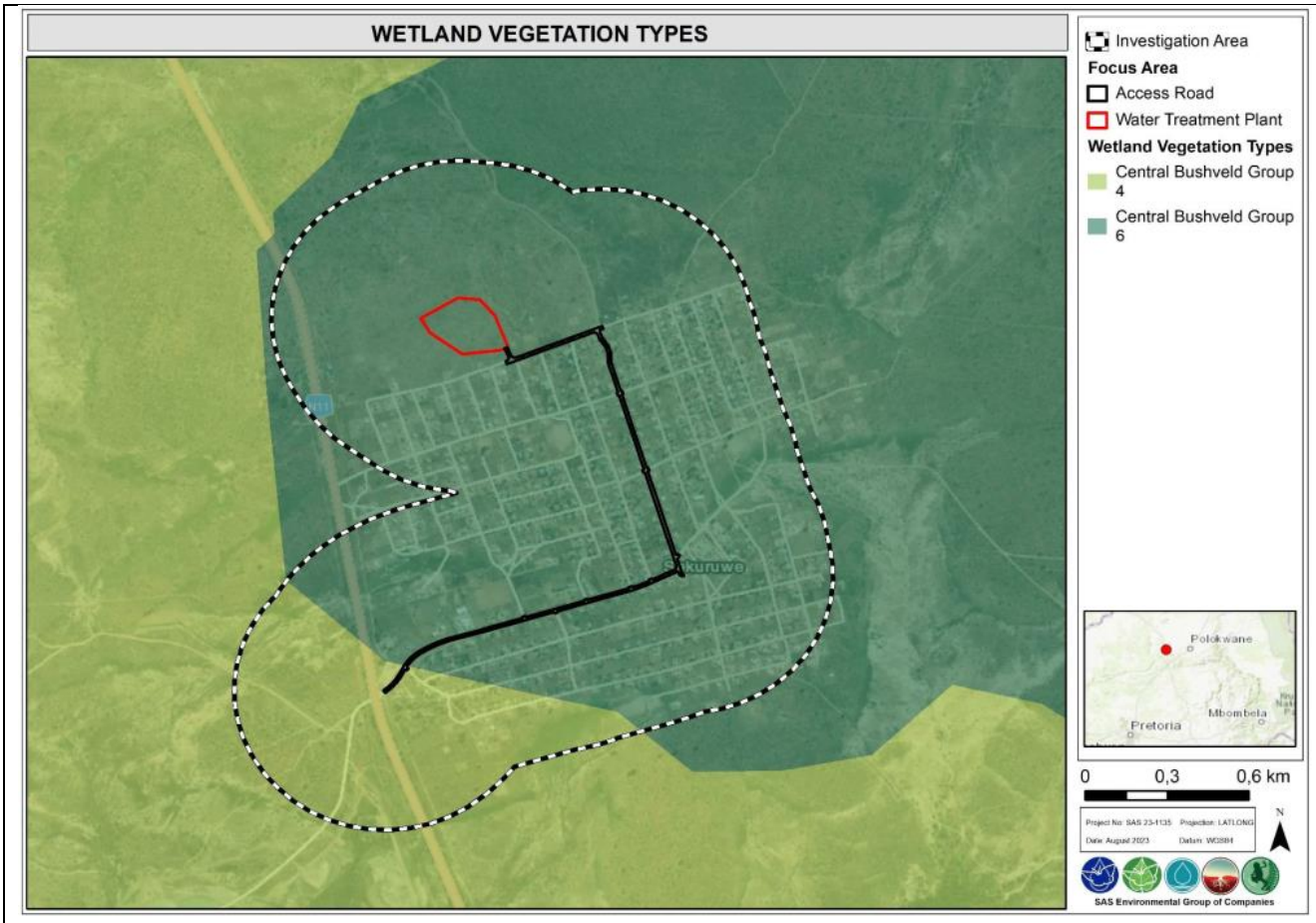


Figure 33: Wetland Vegetation (WetVeg) types associated with the proposed Sekuruwe WTW study area and associated investigation area according to the NFEPA (2011) database.

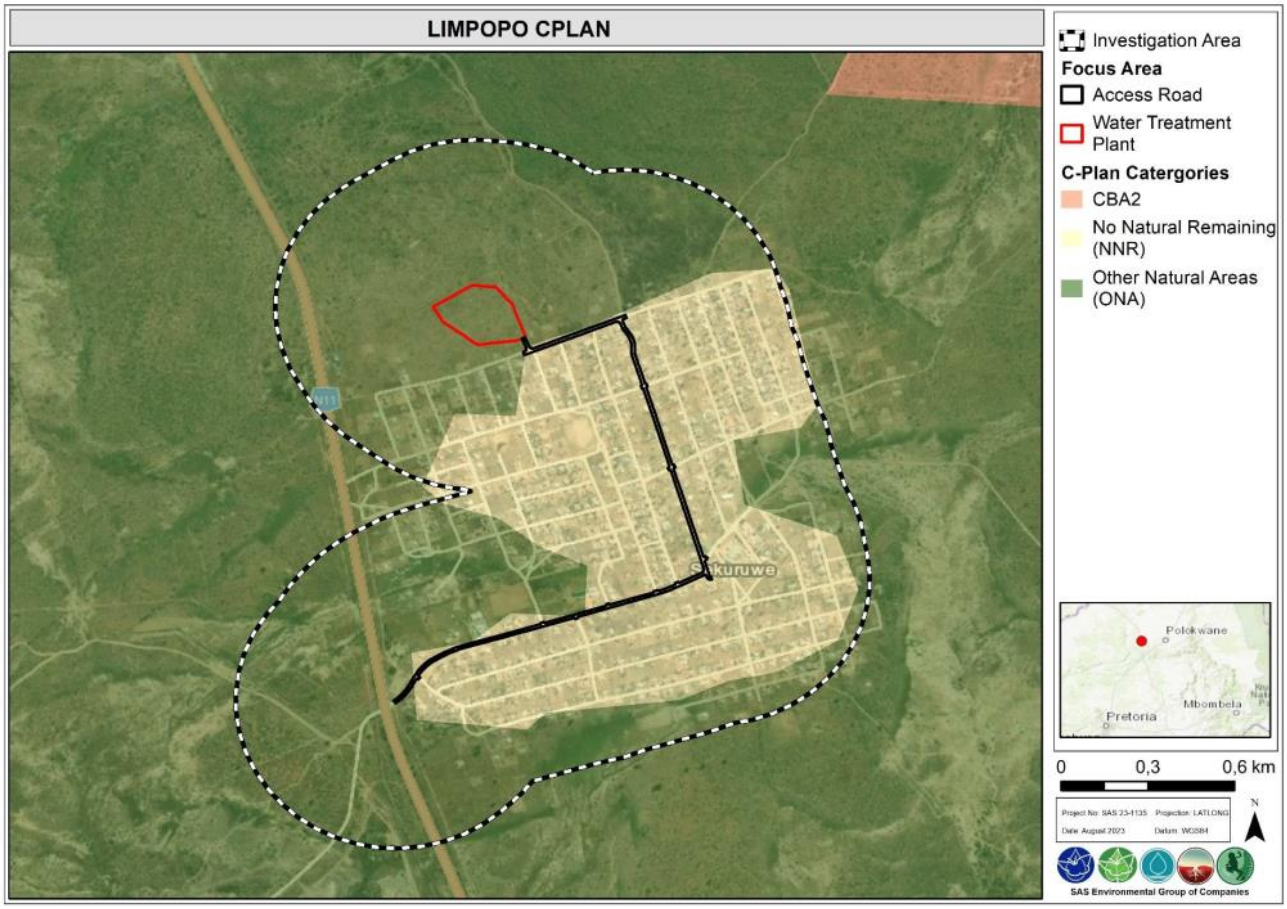


Figure 34: Areas of ecological importance associated with the proposed Sekuruwe WTW study area and associated investigation area according to the Waterberg District Bioregional Plan (2019) (Limpopo Conservation Plan v2).

B. Results: Freshwater Ecosystem Assessment

Freshwater Ecosystem Characterisation and Delineation

The desktop and site assessment confirmed the presence of four (4) freshwater ecosystems associated with the investigation area, with no freshwater ecosystems occurring in the study area (development site). All such freshwater ecosystems are EDLs:

- An EDL that rises in the area just to the north of the edge of the Sekuruwe Settlement and located close to the north-eastern boundary of the study area, draining northwards through the investigation area;
- An EDL located in the north-western part of the investigation area; and
- Two EDLs draining south-westwards from the edge of Sekuruwe in the south-western part of the investigation area.

The freshwater ecosystems identified were classified according to the Classification System (Ollis et al., 2013) as Inland Systems. The freshwater ecosystems fall within the Bankenveld Ecoregion and the Central Bushveld Groups 4 and 6 WetVeg (wetland vegetation) groups, classified by Mbona et al. (2015) as "Vulnerable" and "Critically Endangered" respectively. At Levels 3 (Landscape Unit) and 4 (HGM Type) of the Classification System, the systems were classified as per the summary in **Table 14**, below.

Table 14: Characterisation at Levels 3 and 4 of the Classification System (Ollis et al., 2013) of the freshwater ecosystems associated with the Sekuruwe WTW study and investigation areas.

Freshwater Ecosystem HGM Type	Level 3: Landscape unit	Level 4: Hydrogeomorphic (HGM) Type
River (Episodic Drainage Line)	Valley floor—the base of a valley, situated between two distinct valley side-slopes, where alluvial or fluvial processes typically dominate.	linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water. A river is taken to include both the active channel and the riparian zone as a unit.

The delineated extent of the freshwater ecosystems relative to the proposed Sekuruwe WTW study area and associated investigation area are depicted in **Figure 35** below.

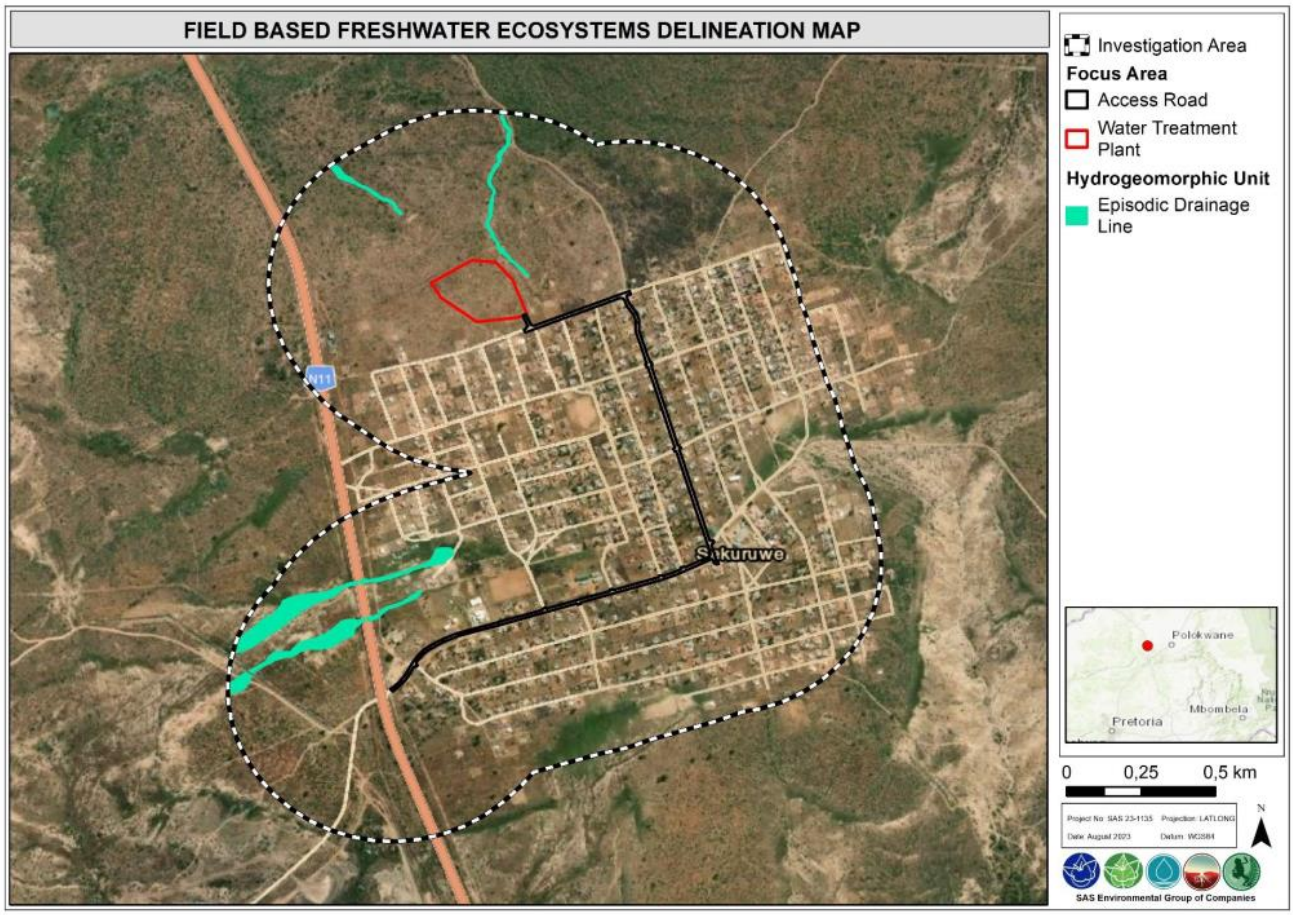


Figure 35: Delineated freshwater ecosystems associated with the proposed Sekuruwe WTW study area and associated investigation area.

Freshwater ecosystem: Site Verification Results

As detailed above, four (4) freshwater ecosystems were confirmed to occur within the investigation area of the proposed development. The settlement of Sekuruwe straddles a local high point and catchment divide, with most of the settlement being located on a crest or on the upper parts of the midslopes in a terrain setting context. Accordingly, there is very limited freshwater occurrence within the confines of the settlement and due to its terrain position all surface water drainage flows away from the settlement. The proposed WTW study area is located on ground that slopes downwards in a northerly direction and thus the two EDLs located in the north of the

investigation area rise in the area to the north of Sekuruwe, draining northwards. The two EDLs in the south-western part of the investigation similarly rise on the outskirts of the settlement close to the N11 national road, draining south-westwards towards the Mogalakwena Mine Waste Rock Dump.

The EDL located in relatively close proximity to the north-eastern boundary of the WTW (approximately 32m at its closest point) rises in a degraded area to the north of the settlement. The EDL is a narrow-channelled feature that is characterised by a poorly defined channel which has largely eroded down to shallowly-outcropping bedrock and which contains some gravelly alluvial material. The EDL is characterised by a relatively steep longitudinal profile. The EDL is characterised by a narrow riparian zone, which naturally consists of a mix of herbaceous vegetation and scattered small trees and shrubs. Many of the larger trees have been felled or cut back for firewood, however the woody vegetation and herbaceous substrate is of a different structure to the surrounding woody vegetation, thus constituting riparian vegetation. The hydrology of the EDL is expected to be highly episodic, only experiencing surface flows when precipitation events of sufficient duration and intensity occur to generate sufficient surface runoff. Such surface runoff is expected to be partly enhanced by the degradation (denudation of surface cover) of the upper parts of the catchment of the EDL, but much of the catchment of the EDL, especially as one moves further away from the settlement is more natural in character.

Figure 36: The upper part of the reach of the EDL (top left), gravelly alluvial material in the channel bed (top right) and the channel and riparian zone in the lower parts of the reach (bottom).

C. Risk Assessment

There are four key ecological impacts on the wetlands that are anticipated to occur namely:

- Loss of freshwater ecosystem habitat and ecological structure;
- Changes to the sociocultural and service provision;
- Impacts on the hydrology and sediment balance of the freshwater ecosystems; and
- Impacts on water quality.

Various activities and development aspects may lead to these impacts, however, provided that the mitigation hierarchy is followed, some impacts can be avoided or adequately minimised where avoidance is not feasible.

Table 15 below summarises the construction phase impacts and recommended mitigation measures of the proposed WTW.

Table 15: Construction-phase impacts and recommended mitigation

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Potential sedimentation of drainage line due to site clearing and poor stormwater management	Short-term	Local	Moderate negative	Slightly detrimental	Unlikely	Very low - negative	•Implementation of construction-phase stormwater controls - e.g. use of silt curtains, berms etc., as part of a multi-phase SWMP for the WTW; •Limiting of clearing of natural vegetation in non-developed parts of the development site footprint.	Short-term	Site-specific	Low negative	Negligible	Unlikely	Very low - negative
Potential pollution of the adjacent drainage line due to poor management of hazardous materials such as paint and hydrocarbons	Short-term	Local	Moderate negative	Slightly detrimental	Unlikely	Very low - negative	•No Storage of hazardous materials on parts of the construction site within 100m from the riparian zone boundaries; •Storage of hazardous materials in a bunded contained space; •Immediate remediation of hazardous material spills.	Short-term	Site-specific	Low negative	Negligible	Unlikely	Very low - negative
Potential pollution of the adjacent drainage line due to poorly controlled cement mixing / batching	Short-term	Local	Moderate negative	Slightly detrimental	Unlikely	Very low - negative	•Fresh concrete and cement mortar must not be mixed near the north-eastern site boundaries or within 100m of the edge of the delineated extent of the drainage line riparian zone; •Mixing of cement must only be undertaken within the construction camp and may not be mixed on bare soils; •Mixing of cement is also to be strictly undertaken within a lined, bound or bunded portable mixer. Ready mix concrete must preferably be used; •A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing; •A washout area must be designated within the part of the development site that is located outside of a 100m buffer of the delineated riparian zone boundary; •Cement bags must be disposed of in the demarcated hazardous waste receptacles; •Liquid cement spillage outside of the demarcated area must be promptly removed and taken to a suitably licenced waste disposal site	Short-term	Site-specific	Low negative	Negligible	Unlikely	Very low - negative
Indiscriminate movement of vehicles and personnel in the adjacent drainage line and potential dumping of construction material / construction waste in the adjacent drainage line	Short-term	Local	Moderate negative	Slightly detrimental	Unlikely	Very low - negative	•Clear demarcation of the riparian boundaries of the adjacent drainage line as a no-go area; •Establish a formal construction waste control system that is properly controlled and enforced	Short-term	Site-specific	Low negative	Negligible	Unlikely	Very low - negative
Potential pollution of downgradient drainage lines by sediment and other pollutants such as paint / bitumen resulting from road upgrading activities	Short-term	Local	Moderate negative	Slightly detrimental	Unlikely	Very low - negative	•Clear demarcation of the riparian boundaries of the adjacent drainage line as a no-go area; •Establish a formal construction waste control system that is properly controlled and enforced	Short-term	Site-specific	Low negative	Negligible	Unlikely	Very low - negative

Table 16 below is a summary of the operational phase impacts and recommended mitigation measures.

Table 16: Operational-phase impacts and recommended mitigation.

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Alteration of hydrology and geomorphology of adjacent drainage line due to poor operational stormwater management at the WTW	Long-term	Local	Moderate negative	Moderately detrimental	Unlikely	Low - negative	•Inclusion of formal stormwater controls in the operational design of the WTW facility; •Inclusion of SuDS principles in the operational stormwater design for the WTW facility.	Long-term	Site-specific	Low negative	Slightly Detrimental	Unlikely	Very low - negative
•Potential discharge of treatment residue into the adjacent drainage line (as one of the potential options for handling residue / waste from the water treatment process) ; that could permanently alter the hydrological characteristics and water quality of the receiving EDL.	Long-term	Local	High negative	Highly detrimental	Fairly likely	Moderate - negative	•It is recommended that water treatment residue (waste byproduct from the treatment process) not be discharged into the adjacent (downgradient) EDL or other EDL in the investigation area, and that options for the disposal of the residue at a suitable landfill site, or its re-use for mining / agricultural activities.	Long-term	Site-specific	Moderate-gative	Moderately Detrimental	Unlikely	Low – negative

D. Conclusion and Recommendation

The specialist concluded that the proposed development will not result in any direct transformative impacts related to the footprint of the proposed WTW on any freshwater ecosystems, however indirect and edge effects could result due to the proximity of the upper parts of the EDL located to the north-east of the development site and as the EDL is downgradient of the development site. There is accordingly a quantum of risk associated with the proposed development on the freshwater environment and potential impacts were thus identified and assessed using the method defined in Appendix A Regulation 509 of 2016 and requisite mitigation measures identified and implemented. The proposed WTW is located in the regulated area of a watercourse as defined by GN 509 and accordingly a Water Use Authorisation (WUA) in terms of the NWA would need to be acquired by the proponent.

The DFFE's National Web-based Environmental Screening Tool (2020) designated the study and investigation areas as **low** aquatic biodiversity (freshwater) sensitivity. This designation has been verified by the assessment as there are no freshwater ecosystems located in the study area (development site) and all freshwater ecosystems in the investigation area are first order episodic drainage lines characterised by a very limited hydroperiod.

3.9. SOCIO-ECONOMIC IMPACTS (ZUTARI, 2023)

The desktop Socio-economic Impact Assessment (SIA) was undertaken by Zutari (Pty) Ltd.

A. Geographical Description of the Project Area

The Sekuruwe WTW is proposed in the MLM which falls within the Waterberg District Municipality (WDM) in the Limpopo Province. The Limpopo Province is South Africa's most northern province and covers an area of 125 754 km^2, it shares international borders with Mozambique, Zimbabwe and Botswana. It also borders the Gauteng, Mpumalanga and North-West Provinces. The WDM is located in the western part of the Limpopo Province and covers an area of 44,913 km^2. It shares a border with the North-West and Gauteng Provinces. It is the biggest district in the province and shares five border control points with Botswana. Main towns in the area are Amandelbult Mine Town, Bela-Bela, Lephalale, Modimolle, Mokopane, Mookgophong, Pienaarsrivier, Thabazimbi and Vaalwater. The MLM covers an area of 6,156 km^2. It was established on 5 December 2000 when the Greater Potgietersrus, Bakenberg and Koedoesrand/Rebone local authorities were amalgamated to form the new municipality.

B. Anticipated Social Impacts: Construction Phase

1. Income for land owners / Occupiers (Land access)

Sekuruwe WTW is proposed on the Farm Blinkwater 820 LR and on the Farm Gillimberg 861 LR, both Farm properties are owned by the National Government (Republic of South Africa). As such, the developer will require land access from the national government. Depending on the negotiations with the national government, access can either mean land purchase, lease agreement or servitude agreement.

Table 17 shows the income for farm owners impact rating and mitigation measures, pre and post mitigation.

Table 17: Income for farm owners (Land access)

IMPACT DESCRIPTION: Income for farm owners (Land access)				
Predicted for project phase:	Pre-construction & construction			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	It is assumed that the developer will enter into short-term payment agreement with the affected land owners, hence the short-term rating	Consequence: Moderately beneficial	Significance: High - positive
Extent	Local	The directly affected land owners will benefit, hence the local rating		
Intensity	Very high - positive	The financial benefit will be very high as the current land use does not generate profits		
Probability	Certain	Land access is certain as the developer doesn't own the affected land portions		
MITIGATION:				
The developer should enter into a formal and fair land access agreement. Depending on the negotiations with the affected land owner/s, land access can either mean land purchase, lease agreement or servitude agreement.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	It is assumed that the developer will enter into short-term payment agreement with the affected land owners, hence the short-term rating	Consequence: Moderately beneficial	Significance: High - positive
Extent	Local	The directly affected land owners will benefit, hence the local rating		
Intensity	Very high - positive	The financial benefit will be very high as the current land use does not generate profits		
Probability	Certain	Land access is certain as the developer doesn't own the affected land portions		

2. Procurement of goods and services

Development projects are known for procurement of goods and services prior and during the construction phase. It is anticipated that this will also be the case for the proposed development and that the developer will require various goods and services, such as the purchase of building supplies and equipment. This requirement is likely to generate economic opportunities for existing SMMEs in the area and potential new SMMEs which will be established because of the proposed development. It is, however, anticipated that some required goods and services might not be available in the local study area. In this case, the developer will procure from businesses elsewhere in the country or outside the country if necessary.

Table 18 shows the procurement of goods and services impact rating and mitigation measures, pre and post mitigation.

Table 18: Procurement of goods and services

IMPACT DESCRIPTION: Procurement of goods and services				
Predicted for project phase:	Pre-construction and construction phase			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately beneficial	Significance: Moderate - positive
Extent	Regional	procurement likely to extend regionally		
Intensity	Moderate - positive	Benefit likely to be moderate should a clear & sound policy be not in place		
Probability	Certain	Procurement of goods and services is certain during construction of any development project		
MITIGATION:				
The developer should put in place a procurement policy aimed at supporting and prioritizing upcoming and qualifying subcontractors or SMMEs, were possible. The policy should be aimed at providing first preference to appropriate subcontractors/SMMEs located in the surrounding communities, followed by those located in the municipal area and lastly those located elsewhere or outside the province.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately beneficial	Significance: High - positive
Extent	Local	procurement likely to extend regionally		
Intensity	Very high - positive	Benefit likely to be very high should a clear and sound policy be in place		
Probability	Certain	Procurement of goods and services is certain during construction of any development project		

3. Employment opportunities

During the construction phase, it is anticipated that employment opportunities will be triggered for skilled, semi-skilled and unskilled workforce. The number of locally employed people during the construction phase of the proposed development will largely depend on the developer's project activities and associated recruitment policy, including the applicant's level of education, skills, and work experience.

Table 19 shows the employment opportunities impact rating and mitigation measures, pre and post mitigation.

Table 19: Employment opportunities

IMPACT DESCRIPTION: Employment opportunities				
Predicted for project phase:	Pre-construction and construction			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately beneficial	Significance: Moderate - positive
Extent	Regional	Impact likely to extend regionally		
Intensity	Moderate - positive	Benefit likely to be moderate should a clear & sound policy be not in place		
Probability	Certain	Employment opportunities are certain during construction of any development project		
MITIGATION:				
The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately beneficial	Significance: High - positive
Extent	Regional	procurement likely to extend regionally		
Intensity	High - positive	Benefit likely to be very high should a clear and sound policy be in place		
Probability	Certain	Employment opportunities are certain during construction of any development project		

4. Community expectations

It is anticipated that community expectations will be very high during the construction phase. The development is proposed nearby communities where the unemployment rates are very high, as such, unemployed individuals and opportunity seekers from doorstep communities are anticipated to have high expectations related to employment and business opportunities. Should these expectations be not met, individuals and community groups can mobilize against the project.

Table 20 shows the community expectations impact rating and mitigation measures, pre and post mitigation.

Table 20: Community expectations

Community Expectations				
Predicted for project phase:	Pre-construction and construction			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately detrimental	Significance: High - negative
Extent	Local	Local communities likely to have expectations		
Intensity	Very high - negative	Expectations likely to be very high if not managed		
Probability	Certain	Expectations are certain during construction of any development project		
MITIGATION:				
Community expectations should be managed via timely and clear messaging throughout the Stakeholder engagement and consultation process				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Slightly detrimental	Significance: Low - negative
Extent	Local	Local communities likely to have expectations		
Intensity	Low - negative	Expectations likely to be negligible to minor if managed		
Probability	Certain	Expectations are certain during construction of any development project		

5. Health, safety and security

Construction projects are generally known to impact negatively on the health and safety of communities and employees. It is anticipated that similar impacts will be triggered by the proposed development. During the construction phase, nearby communities and employees may be exposed to increased dust, noise, visual and other nuisance disturbances, construction vehicles and man-machine interfaces. The dust will likely to be induced by construction phase activities such as excavation, cement mixing and material or waste transportation. The dust from construction activities may affect the respiratory system of those exposed to the dust. Construction noise will likely be induced by construction machines and transportation vehicles and although the construction noise will not damage the hearing ability of those exposed to the noise in the community, it will be at a nuisance level. Also, Additionally, an influx of job and opportunity seekers is often characterized by higher health risks, particularly if the influx is male dominated. These include a higher disease burden and rise in HIV/AIDS rates

Construction activities are likely to attract criminals into the area, hence compromising the security of nearby farm owners, communities, and employees. During the construction phase, it is anticipated that that criminal activities will escalate in the area, including the trespassing of properties.

Table 21 shows the health, safety and security impact rating and mitigation measures, pre and post mitigation.

Table 21: Health, safety, and security

IMPACT DESCRIPTION: Health, safety, and security				
Predicted for project phase:	Pre-construction and construction			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately detrimental	Significance: Low - negative
Extent	Local	Impact likely to extend to local communities		
Intensity	Moderate - negative	Impact likely to be moderately high if not managed		
Probability	Very likely	Health, safety, and security impacts are likely during the construction phase		
MITIGATION:				
The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc. The developer should make sufficient provision for all security measures, not just access control and monitoring of criminal activities during the pre-operation phases.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Slightly detrimental	Significance: Low – negative
Extent	Local	Impact likely to extend to local communities		
Intensity	Low - negative	Impact likely to be moderately high if not managed		
Probability	Fairly likely	Health and safety impacts are fairly likely if managed during the construction phase		

6. Traffic and damage to local access road

The access road for the proposed Sekuruwe WTW is an existing road which transverse through the Sekuruwe community. It is anticipated that this will increase the traffic in the area and that the access road will be subject to damage. Heavy duty trucks and construction vehicles cause damage to the current road conditions as well as contribute to increased dust and congestion on the roads.

Table 22 shows the traffic and damage to local access road impact rating and mitigation measures, pre and post mitigation.

Table 22: Traffic and damage to local access road

IMPACT DESCRIPTION: Traffic and damage to local and access road	
Predicted for project phase:	Pre-construction and construction

PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Moderately detrimental	Significance: Moderate - negative
Extent	Local	Impact likely to affect local social receptors		
Intensity	Very high - negative	impact likely to be very high if not managed		
Probability	Very likely	Traffic and damage to local access road very likely if not managed		
MITIGATION:				
Traffic should be managed as per the recommendations made in the traffic impact assessment specialist study. The developer should regularly maintain the existing road to avoid damage to the road				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the construction phase, which is anticipated to be short-term	Consequence: Negligible	Significance: Very low
Extent	Site-specific	Impact likely to affect local social receptors		
Intensity	Low - negative	impact likely to be low if managed		
Probability	Fairly likely	Traffic and damage to local access road fairly likely if managed		

C. Anticipated Social Impacts: Operation Phase

1. Employment Opportunities

During the operation phase, it is anticipated that long-term and permanent opportunities related to WTW functionality and maintenance be induced during this phase. Consequently, this will contribute positively to the income of the successful job applicants as they will be able to support their dependents for an extended period. Like the construction phase, the number of locally employed people during the operational phase will largely depend on the developer's recruitment policy and the applicant's level of education, skills, and work experience.

Table 23 shows the employment opportunities impact rating and mitigation measures, pre and post mitigation.

Table 23: Employment opportunities

IMPACT DESCRIPTION: Employment opportunities				
Predicted for project phase:	Operation			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will prevail during the operation phase, which is anticipated to be long-term	Consequence: Moderately beneficial	Significance: High - positive
Extent	Regional	Impact likely to extend regionally		

Intensity	Low - positive	Benefit likely to be low should a clear & sound policy be not in place		
Probability	Certain	Employment opportunities are certain during operation of any development project		
MITIGATION:				
The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will prevail during the operation phase, which is anticipated to be long-term	Consequence: Highly beneficial	Significance: Very high - positive
Extent	Regional	Procurement likely to extend regionally		
Intensity	High - positive	Benefit likely to be high should a clear and sound policy be in place		
Probability	Certain	Employment opportunities are certain during operation phase of any development project		

2. Access to potable water for selected communities in the Northern Limb

Mogalakwena Local Municipality has been reported to be severely water stressed and experiencing water shortages. It is anticipated that selected doorstep communities in the Northen limb (*as per the Water Management Master Plan*) will have access to potable water.

Water shortages are an issue in the proposed project area. Unfortunately, serious water shortages may be accompanied by chronic illnesses; thus, putting pressure on the hospitals and clinics. Sufficient water supply minimises the spread of diseases in an area and increases the livelihood status of the individuals. Additionally, A secure water supply reduces expenditure on health-related costs in a society. In most developing countries people spend a third of their income on medical costs mostly from water-related diseases such as malaria and diarrhea. Further, water supplies the individual with the opportunity to do everyday activities such as drinking water, cooking, bathing, and cleaning. .

Table 24 shows the access to Potable water for selected communities in the Northern Limb impact rating and mitigation measures, pre and post mitigation.

Table 24: Access to potable water for selected communities in the Northern Limb

IMPACT DESCRIPTION: Access to potable water for selected communities in the Northern limb				
Predicted for project phase:	Operation			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will prevail during the operation phase, which is anticipated to be long-term	Consequence: Moderately beneficial	Significance: High - positive
Extent	Local	Local communities in the northern limb are likely to benefit from Potable water		

Intensity	Moderate - positive	Benefit likely to be moderate prior to implementation of the master plan		
Probability	Certain	It is certain that selected communities as per the master plan will have access to Potable water		
MITIGATION:				
A Water Management Master Plan should be in place, clearly specifying which communities in the Northen limb will benefit from accessing potable water				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will prevail during the operation phase, which is anticipated to be long-term	Consequence: Highly beneficial	Significance: Very high - positive
Extent	Regional	Local communities in the northern limb are likely to benefit from Potable water		
Intensity	High - positive	Benefit likely to be high following the implementation of mater plan		
Probability	Certain	It is certain that selected communities as per the master plan will have access to Potable water		

3. Community Expectations

Once the WTW is operational, it is anticipated that doorstep communities, especially those in the Northen limb will expect to have access to potable water. Unfortunately, it is assumed that not all communities in the study area will have access to potable water from this specific development, it is assumed by the specialist that the proposed WTW will serve the communities generally situated along the route of the proposed 2B+ pipeline project and the communities surrounding the commercial users in the area between Mokopane and Sekuruwe. However, the beneficiaries of the potable water in the Northern limb will be determined as per the Water Management Master Plan.

Table 25 shows the community expectations impact rating and mitigation measures, pre and post mitigation.

Table 25: community expectations

IMPACT DESCRIPTION: community expectations				
Predicted for project phase:	Operation			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will prevail during the operation phase, which is anticipated to be long-term	Consequence: Highly detrimental	Significance: High - negative
Extent	Local	Local communities likely to have expectations		
Intensity	Very high - negative	Expectations likely to be very high if not managed		
Probability	Very likely	Expectations are certain during operation of any development project		
MITIGATION:				

The Water Management Master Plan and associated beneficiaries should be communicated to the project interested and affected communities, to avoid creating expectations to from those communities which will not benefit from the project.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will prevail during the operation phase, which is anticipated to be long-term	Consequence: Moderately detrimental	Significance: Low - negative
Extent	Local	Local communities likely to have expectations		
Intensity	Moderate - negative	Expectations likely to be moderate if not managed		
Probability	Fairly likely	Expectations are anticipated to be fairly likely if managed		

4. Health and safety

During the operation phase, some of the activities associated with the maintenance of the WTW will be reliant on human labour and therefore operation phase workforce will be exposed to health and safety risks. It is anticipated that injuries can occur due to incorrect handling of equipment and materials failing from heights, stacked items tipping over, accidents involving forklifts and vehicles, and exposure to hot and cold temperatures. Additionally, it is also anticipated that operational noise will be a health hazard during operation (may damage the hearing ability of those exposed to the noise) and the noise will likely be introduced by back-up generators as well. Confined space entry and chemical exposure are also risks that can occur during the operation phase of the asset.

Table 26 shows the health and safety impact rating and mitigation measures, pre and post mitigation.

Table 26: Health and Safety

IMPACT DESCRIPTION: Health and safety				
Predicted for project phase:	Operation			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will remain present during the full operational phase of the asset.	Consequence: Moderately detrimental	Significance: High - negative
Extent	Local	Impact likely to extend locally		
Intensity	High - negative	Impact will be high if not managed.		
Probability	Certain	Probability for incidents and injuries are almost certain if not managed		
MITIGATION:				
The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact will remain present during the full operational phase of the asset.	Consequence: Moderately detrimental	Significance: Low - negative

Extent	Local	Impact likely to extend locally		
Intensity	Moderate - negative	Impact will be moderate when managed.		
Probability	Fairly likely	Probability for incidents and injuries are fairly likely as operational risks will always be present.		

D. Anticipated Social Impacts: Decommission Phase

1. Employment and business opportunities

Although the operation phase workforce will lose their jobs during this time, short term employment and businesses will be created with the aim of executing the decommission activities.

Table 27 shows the employment and business opportunities impact rating and mitigation measures, pre and post mitigation.

Table 27: Employment and business opportunities

IMPACT DESCRIPTION: Employment and business opportunities				
Predicted for project phase:	Decommission			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the decommission phase, which is anticipated to be short-term	Consequence: Moderately beneficial	Significance: Moderate - positive
Extent	Regional	Impact likely to extend regionally		
Intensity	Moderate - positive	Intensity anticipated to be moderate		
Probability	Certain	Employment and business opportunities are certain during decommission of any development project		
MITIGATION:				
The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region, including a procurement policy aimed at supporting and prioritizing upcoming and qualifying subcontractors or SMMEs, were possible				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will prevail during the decommission phase, which is anticipated to be short-term	Consequence: Moderately beneficial	Significance: High - positive
Extent	Regional	Impact likely to extend regionally		
Intensity	High - positive	Intensity anticipated to be high post mitigation		
Probability	Certain	Employment and business opportunities are certain during decommission of any development project		

2. Health and safety

Decommission activities are likely to impact negative on the health and safety of employees and communities. The health and safety are likely to be induced by decommissioning activities such as demolition and the handling and transportation of demolished materials.

Table 28 shows the health and safety impact rating and mitigation measures, pre and post mitigation.

Table 28: Health and Safety

IMPACT DESCRIPTION: Health and safety				
Predicted for project phase:	Decommission			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will only remain during the decommissioning phase.	Consequence: Slightly detrimental	Significance: Low - negative
Extent	Site-specific	Impact will be limited the site being decommissioned.		
Intensity	Moderate - negative	Impact will be moderately negative if not managed properly.		
Probability	Very likely	Probability for incidents and injuries are very likely if not manged properly.		
MITIGATION:				
The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc. and as per the Client's duties as defined in the Construction Regulations (Occupational Health and Safety Act)				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact will only remain during the decommissioning phase.	Consequence: Negligible	Significance: Very low
Extent	Site-specific	Impact will be limited the site being decommissioned.		
Intensity	Low - negative	Impact will be low if managed properly.		
Probability	Fairly likely	Probability for incidents and injuries are less likely when manged properly.		

3. No access to potable water

Should the proposed WTW be decommissioned, social water users will not have access to potable water. Specifically, the selected doorstep communities in the Northern limb (as per the Water Management Master Plan).

Table 29 shows the no access to Potable water impact rating and mitigation measures, pre and post mitigation.

Table 29: No access to potable water

IMPACT DESCRIPTION: No access to potable water

Predicted for project phase:	Decommission			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact anticipated to be long-term	Consequence: Highly detrimental	Significance: Very high - negative
Extent	Local	Lack of access to water will affect the local beneficiaries		
Intensity	Very high - negative	Impact intensity anticipated to be very high if not managed		
Probability	Certain	Impact certain should the development decommission		
MITIGATION:				
Potable water beneficiaries should be notified on the decommissioning of the WTW prior to decommissioning. The municipality should provide alternative potable water source for the northern limb beneficiaries				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact anticipated to be long-term	Consequence: Moderately detrimental	Significance: Moderate - negative
Extent	Local	Lack of access to water will affect the local beneficiaries		
Intensity	Moderate - negative	Impact intensity anticipated to be moderate if managed		
Probability	Very likely	Impact very likely should the development decommission		

4. Loss of employment and business opportunities

It is anticipated that operation phase workforce will lose their jobs during the decommission phase, including businesses opportunities which would have been induced by the need for procurement of operational goods and services.

Table 30 shows the loss of employment and business opportunities impact rating and mitigation measures, pre and post mitigation.

Table 30: Loss of employment and business opportunities

IMPACT DESCRIPTION: Loss of employment and business opportunities				
Predicted for project phase:	Decommission			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact anticipated to be long-term	Consequence: Extremely detrimental	Significance: Very high - negative
Extent	Regional	Impact likely to extend regionally		
Intensity	Very high - negative	Impact intensity anticipated to be very high if not managed		
Probability	Certain	Impact certain should the development decommission		
MITIGATION:				

Employees and businesses benefiting from operation of the WTW should be notified in time regarding the decommissioning of the WTW prior to decommissioning				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact anticipated to be long-term	Consequence: Moderately detrimental	Significance: Low - negative
Extent	Regional	Impact likely to extend regionally		
Intensity	Low - negative	Impact intensity anticipated to be low if managed		
Probability	Fairly likely	Impact fairly likely if managed		

E. Assessment of No-go Alternative

As per the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the alternative of not proceeding with the proposed project; must be assessed as an alternative. The no-go alternative implies that the Sekuruwe WTW does not proceed, hence the current status quo remains the same. This section defines a situation which would result should the proposed project not proceed.

The Department of Human Settlement and Water and Sanitation published the Water Master plan for South Africa which specifically indicated that South Africa as a country is experiencing a water crisis by insufficient water infrastructure maintenance and investment, recurrent droughts driven by climatic variation, inequities in access to water and sanitation, deteriorating water quality, and a lack of skilled water engineers.

The proposed Sekuruwe WTW is part of the OMM programme. The OMM Programme intends to build, operate and maintain bulk and potable water infrastructure in the Eastern and Northern Limb of the Limpopo Province. As such, this would address the water crisis caused by insufficient water infrastructure maintenance and investment identified in the Water Master Plan. It is also essential to note that the OMM programme is aligned with the NIP, 2050 (Phase I), and the goals of the NDP 2011. The NDP anticipates, amongst others, universal and reliable access to water of an acceptable quality and quantity in support of a strong, inclusive economy and a healthy environment by the year 2030.

It is also essential to note that the OMM programme is aligned with the NIP, 2050 (Phase I), and the goals of the National Development plan (NDP) 2011, the NDP anticipates, amongst others, universal and reliable access to water of an acceptable quality and quantity in support of a strong, inclusive economy and a healthy environment by the year 2030.

The overall impact associated with not proceeding with the proposed WTW would entail the failure of the OMM programme to fully align with the country's plan on infrastructure development, especially the provision of potable water to social users. Specifically, the selected doorstep communities front of the Northern limb (as per the Water Management Master Plan) will not have access to potable water.

The other anticipated positive and negative social impacts likely to be induced by the proposed WTW (as identified in the SIA) will not be realised.

Table 31 below, presents the no-go assessment associated with the proposed Sekuruwe WTW.

Table 31: No-go assessment associated with the proposed Mokopane alternative 1 & 2 and Sekuruwe WTW

Code	Impact	Pre-mitigation:					
		Duration	Extent	Intensity	Consequence	Probability	Significance

1	No-go alternative	Long-term	Regional	Very high - negative	Extremely detrimental	Certain	Very high - negative

F. Conclusion and Recommendations

The proposed WTW is a strategic infrastructure development project that is aligned with the National Infrastructure Plan (NIP) and the overall goals of the National Development Plan (NDP). The findings of the SIA indicate that the recommended mitigation measures are expected to reduce the significance of the identified negative impacts to acceptable levels, while positive impacts will on average be significantly enhanced to maximise benefits to surrounding communities in the Northern Limb. It is finally recommended that the developer should respectively consider the proposed mitigation and maximisation measures included in the report to decrease the effect of negative impacts on communities and maximise the effect of positive impacts. Additionally, the specialist recommends that the proposed development should be authorised since the no-go alternative would hinder the execution of the national strategic plans aimed at providing potable water to communities for social use.

3.10. VISUAL IMPACTS (SCIENTIFIC AQUATIC SERVICES, 2023)

A Visual compliance statement was prepared by Scientific Aquatic Services (SAS). The field assessment was undertaken during the spring season on the 5th of September 2023 for the focus area (i.e., the Sekuruwe WTW). The season within which the Visual Impact Assessment (VIA) takes place is irrelevant as the vegetation screening factor will remain similar. Seasonal colour variation will however be evident between winter and summer.

Figure 37 below is an illustration of a visual model of the Sekuruwe settlement. The arrows indicate the direction in which the majority of the small houses are facing. Based on the visual model, the majority of the settlement is not facing the direction of the proposed Sekuruwe WTW, thus the visual impact is not considered significantly high.

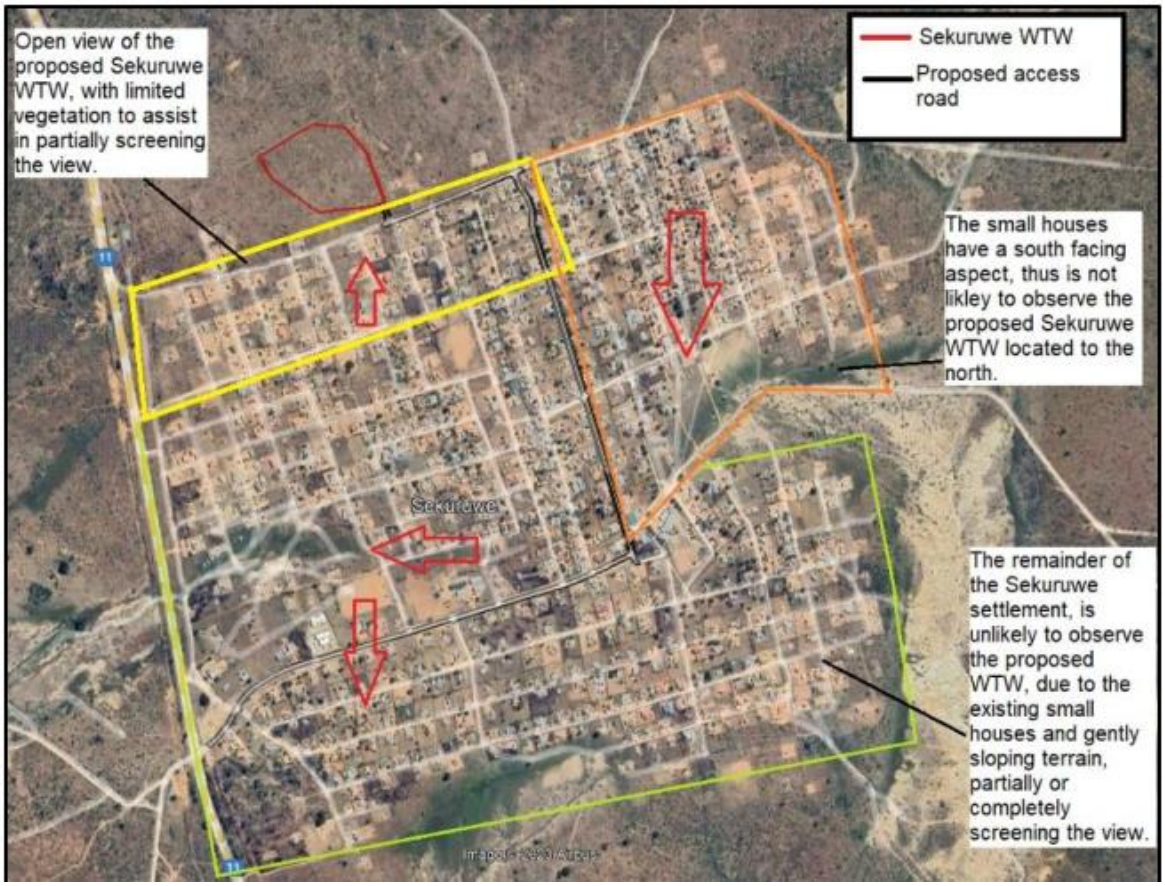


Figure 37: Visual model of the Sekuruwe settlement.

Figure 38 below is an illustration of a visual model of the N11 national road. Based on the visual model, the mine waste rock dumps act as major screens for the proposed Sekuruwe WTW, thus any potential receptors located to the west and southwest are completely screened from view. Motorists traveling along the N11 national road will mostly have a clear line of sight directly west and north northwest of the proposed Sekuruwe WTW, while motorists located to the south will not have a clear line of sight, due to the Sekuruwe settlement screening the view.

Figure 38: Visual model of the N11 national road.

Due to the Sekuruwe WTW situated directly adjacent to the settlement, the residents in this portion of the settlement will have direct views of the proposed infrastructure (red arrow) (**Figure 39**).

Figure 39: View from the Sekuruwe settlement directly south of the proposed Sekuruwe WTW.

A. Impact Statement

Since the proposed Sekuruwe WTW is situated adjacent to the Sekuruwe settlement and within 5 km of the Mogalakwena Mine and its existing waste rock dumps, the landscape has been degraded by anthropogenic activities and the receptors located within the receiving environment have grown accustomed to an altered landscape. Therefore, it may be concluded that the proposed development will have a minimal visual impact on the receiving environment.

When considering the development phases of the proposed project, the construction phase will have the highest visual intrusion due to the removal of vegetation and levelling of the ground in preparation for the proposed Sekuruwe settlement, with increased vehicular movement in the area, temporarily altering the sense of place of the area as well. The points below briefly describe the visual impacts the proposed project will have during the construction and operational phases:

- The sense of place of the area will shift from calmness and tranquility to busy due to vehicular movement in the area during the preparation of the area and removal of vegetation for the proposed Sekuruwe WTW;
- Visual contrast to the surrounding environment may occur during excavation activities and the yellow construction vehicles may be clearly noticeable from the green and brown background formed by the vegetation, mountainous terrain and waste rock dumps;
- Direct visual exposure of the construction activities will occur for road users traveling on the N11 national road, within a limited distance and duration along the N11 national road, as well as indirectly through fugitive dust generated by the earthworks on a windy day; and
- The sources of lighting associated with the proposed Sekuruwe WTW will contribute somewhat to the effects of night time lighting and skyglow.

The mitigation measures outlined below would serve to minimise the potential visual impacts during the construction and operational phases of the proposed project:

- The development footprint and disturbed areas surrounding the proposed Sekuruwe settlement should be kept as small as possible, and the areas cleared of natural vegetation and topsoil must be kept to a minimum;
- All construction areas must be kept in a neat and orderly condition at all times and fenced of;
- Making use of motion detectors on security lighting, where possible, ensures that the site will remain in relative darkness, until lighting is required for security purposes;
- It is recommended that partial screening of the proposed Sekuruwe WTW takes place, especially to the small houses located directly south of the proposed Sekuruwe WTW.
- Partial screening can be achieved by planting a row of locally indigenous trees along the southern periphery of the Sekuruwe WTW; and
- Should any activities take place within close proximity to the N11 national roadway, it must be ensured that the roadside vegetation, with particular mention of the trees. shrubs, be retained in order to partly obscure the view toward the proposed development.

The table below gives an overview of the impact assessment for the proposed project.

Table 32: Impact assessment overview for the proposed project.

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Impact on Landscape Character and Sense of Place	Short-term	Local	Low - negative	Slightly detrimental	Certain	Low - negative	* The development footprint and disturbed areas surrounding the proposed Sekuruwe WTW should be kept as small as possible and the areas cleared of natural vegetation and topsoil must be kept to a minimum; * All construction areas must be kept in a neat and orderly condition at all times and fenced of; * It is recommended that partial screening of the proposed Sekuruwe WTW takes place, especially to the small houses located directly south of the proposed Sekuruwe WTW. Partial screening can be achieved by planting a row of locally indigenous trees along the southern periphery of the Sekuruwe WTW; and * Should any activities take place within close proximity to the N11 national roadway, it must be ensured that the roadside vegetation, with particular mention of the trees. shrubs, be retained in order to partly obscure the view toward the proposed development.	Short-term	Site-specific	Low - negative	Negligible	Certain	Low - negative
Visual intrusion impacts	Medium-term	Local	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	* Construction and operation activities should be kept as short as possible, to reduce the visual intrusion on the receiving environment; * The height of structures should be a low as possible, where this can be achieved without increasing the infrastructure footprint; * Appropriate use of colours must be considered, it is recommended that neutral colours, such as shades of browns are to be utilised. Reflective materials are to be avoided as far as possible; * It is recommended that partial screening of the proposed Sekuruwe WTW takes place, especially to the small houses located directly south of the proposed Sekuruwe WTW. Partial screening can be achieved by planting a row of locally indigenous trees along the southern periphery of the Sekuruwe WTW; and * Should any activities take place within close proximity to the N11 national roadway, it must be ensured that the roadside vegetation, with particular mention of the trees. shrubs, be retained in order to partly obscure the view toward the proposed development.	Short-term	Site-specific	Low - negative	Negligible	Certain	Low - negative
Visual exposure and visibility impacts	Medium-term	Local		Moderately detrimental	Certain	Moderate - negative	* Construction and operation activities should take place as quickly as possible, to reduce the visual exposure to the impacted area; * Housekeeping of the site during construction and operational activities must be maintained at a high standard. The site should be screened through the use of a fence which will result in a more unified and tidy appearance; * It is recommended that partial screening of the proposed Sekuruwe WTW takes place, especially to the small houses located directly south of the proposed Sekuruwe WTW. Partial screening can be achieved by planting a row of locally indigenous trees along the southern periphery of the Sekuruwe WTW; and * Should any activities take place within close proximity to the N11 national roadway, it must be ensured that the roadside vegetation, with particular mention of the trees. shrubs, be retained in order to partly obscure the view toward the proposed development.	Short-term	Site-specific	Low - negative	Negligible	Certain	Low - negative
Impacts due to Night time lighting	Medium-term	Local	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	* As far as possible, operational activities should take place during the daylight hours, in order to limit the use of bright floodlighting and to avoid the use of additional night-time lighting which may lead to skyglow; * An engineer may be consulted to assist in the planning and placement of light fixtures in order to reduce visual impacts associated with glare and light trespass; * Outdoor lighting must be strictly controlled; * The use of high light masts and high pole top security lighting should be avoided along the periphery of the buildings; * Up-lighting of structures must be avoided, with lighting installed at downward angles that provide precisely directed illumination beyond the immediate surroundings of the infrastructure, thereby minimising the light spill and trespass; * Care should be taken when selecting luminaries to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum. Only "full cut-off" light fixtures that direct light only below the horizontal must be used on the buildings; * Censored and motion lighting may be installed to prevent use of lights when not needed. * Minimum wattage light fixtures should be used, with the minimum intensity necessary to accomplish the light's purpose; * The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent reduces skyglow and wildlife impacts; and * Vehicle-mounted lights or portable light towers are preferred over permanently mounted lighting for night-time maintenance activities. If possible, such lighting should be equipped with hoods or louvers and be aimed toward the ground to avoid causing glare and skyglow (BLM, 2013).	Short-term	Site-specific	Moderate - negative	Slightly detrimental	Certain	Low - negative

B. Conclusion and Recommendations

It is important to note that visual impacts are only experienced when there are receptors present to experience the impact. The outcome of the desktop and field assessments indicated that that the only sensitive receptors within the visual assessment zone comprise the Sekuruwe settlement, the N11 national road and one farmstead. Since the focus area is located within a landscape where active mining is taking place, the proposed Sekuruwe WTW will not be distinguishable nor significantly visually intrusive on the receiving environment. When considering the broader landscape, mining is a dominant land-use and the mining infrastructure (dumps and TSFs) form prominent features in the landscape and form part of the skyline, hence the proposed infrastructure will disappear into already existing mining infrastructure. The local topography of the focus area is relatively flat surrounded mountainous terrain interspersed with mining infrastructure which form part of the skyline.

The proposed Sekuruwe WTW is therefore analogous to a low sensitivity as likely presented by the DFFE Screening Tool. Based on the findings of the visual assessment, the proposed Sekuruwe WTW is expected to have a minimal visual impact on the receiving environment. It is therefore the opinion of the specialist that the project be considered favorably from a visual resource management perspective, provided that it is ensured that the best long-term use of the resources in the project area will be made in support of the principle of sustainable development.

3.11. TERRESTRIAL IMPACTS (SCIENTIFIC TERRESTRIAL SERVICES, 2023)

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed to prepare a terrestrial compliance statement (where relevant) for the proposed Sekuruwe WTW and associated infrastructure.

A field investigation to ground truth the desktop findings was undertaken on the 29th of August 2023. The focus area was considered utilising digital satellite imagery prior to and after the field investigation. Prior to the site visit, all species that were triggered by the screening tool (where applicable) for the plant and animal themes, were used to guide fieldwork preparation.

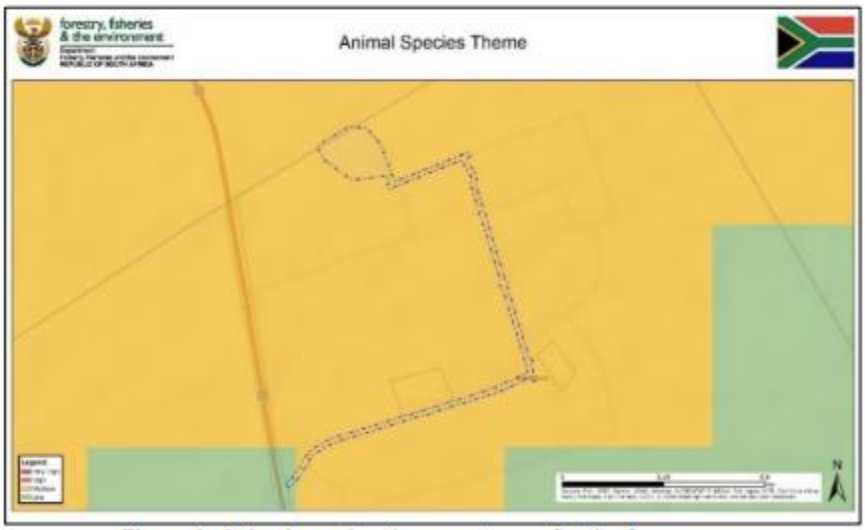
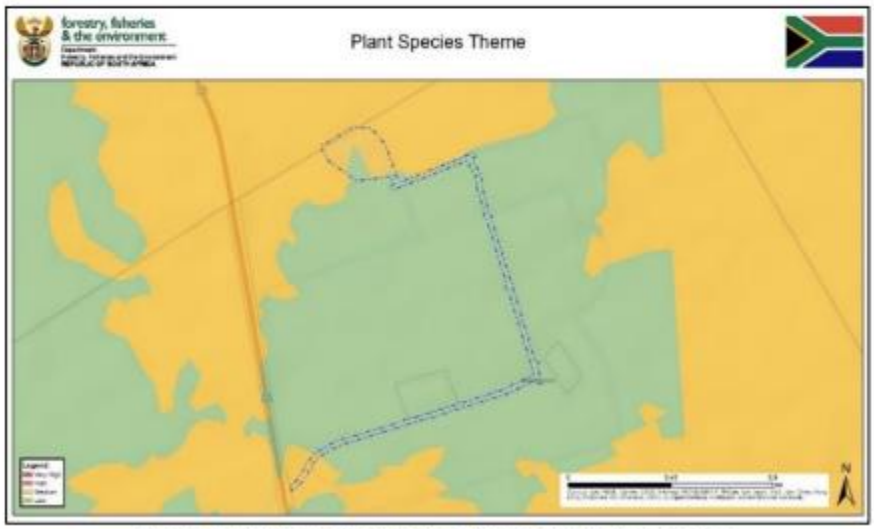
A. Investigation findings

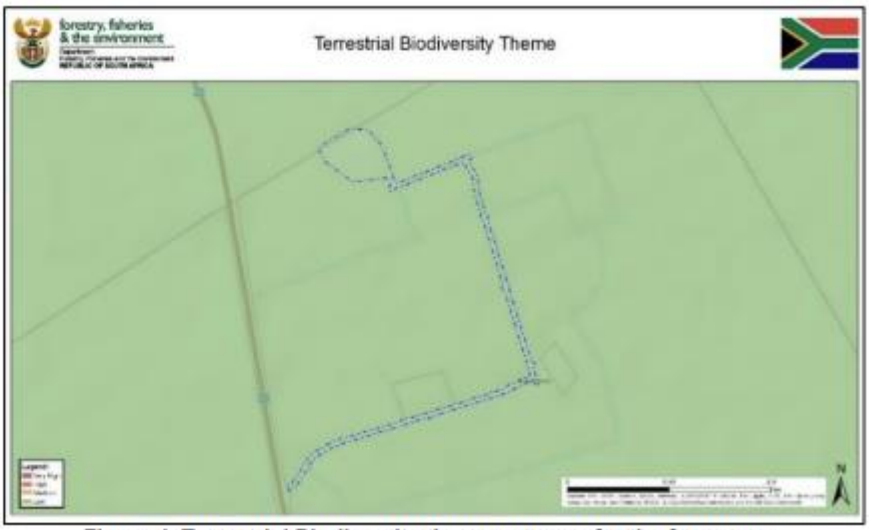
Outcomes of the Application of the Screening Tool

According to the screening tool, the focus area occurs in an area of low and medium sensitivity for the animal species theme, in a low and medium sensitivity for the plant species theme, and for terrestrial biodiversity theme the screening tool identified the area as a low sensitivity area.

Table 33: The table below includes the outcome of the screening tool for the focus area as it pertains to the Terrestrial Biodiversity, Plant, and Animal themes. The screening tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the

EA process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas.

Animal Species Theme	For the animal species theme, the focus area is considered to have a **medium sensitivity** due to potential suitable habitat for the following trigger species: - Mammal: *Dasymys robertsii* (Robert's Shaggy Rat, Data Deficient (DD)).  **Figure 2: Animal species theme outcome for the focus area.**
Plant Species Theme	For the Plant Species theme, the screening tool identified section of the focus area as a **medium sensitivity** area, whereas most of the focus area is within a **low sensitivity** area. The medium sensitivity of the focus area is due to the potential presence of habitat for the following trigger species: - Sensitive species 1252 (vulnerable (VU)).  **Figure 3: Plant species theme outcome for the focus area.**

Terrestrial Biodiversity Theme	The terrestrial sensitivity for the entire focus area is considered to have a **low sensitivity**.  **Figure 4: Terrestrial Biodiversity theme outcome for the focus area.**

Desktop Research Results

- The focus area is in the Central Bushveld Bioregion, which is situated within the Savanna Biome (more details provided in Appendix B: Table B1 of the compliance report). The National Vegetation Map project (VegMAP) indicated the associated vegetation types to consist of the Makhado Sweet Bushveld (SVcb 20) and the Polokwane Plateau Bushveld (SVcb 23);
- According to the Red List of Ecosystems (RLE) dataset (2022), the focus area is located only within the remaining extent of the Polokwane Plateau Bushveld ecosystem (which is a least concern (LC) ecosystem);
- The focus area is not located directly within any protected or conservation areas; however, the Witvinger Nature Reserve is approximately 9 km southeast of the focus area (South African Protected Areas Database (SAPAD) v 2023-Q1) ; and
- The focus area is not within important conservation areas from a bioregional perspective, i.e., the 2018 Limpopo Province Map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) indicate that the focus area is within areas classified as other natural areas (ONA) and no natural remaining (NNR). This is in alignment with the 2016 Waterberg District Bioregional Plan.

Please refer to Appendix A of the Terrestrial compliance report for pictorial evidence of the abovementioned results.

Field Survey Results

The proposed access road is entirely within a transformed area (i.e., the Sekuruwe township) and has been since at least 2004 (earliest available Google Earth satellite imagery). The vegetation within the proposed access road was largely absent (i.e., transformed habitat), apart from alien vegetation such as *Jacaranda mimosifolia* and *Tagetes minuta*. **Figure 40** provides a depiction of the proposed access road habitat along with representative photographs.

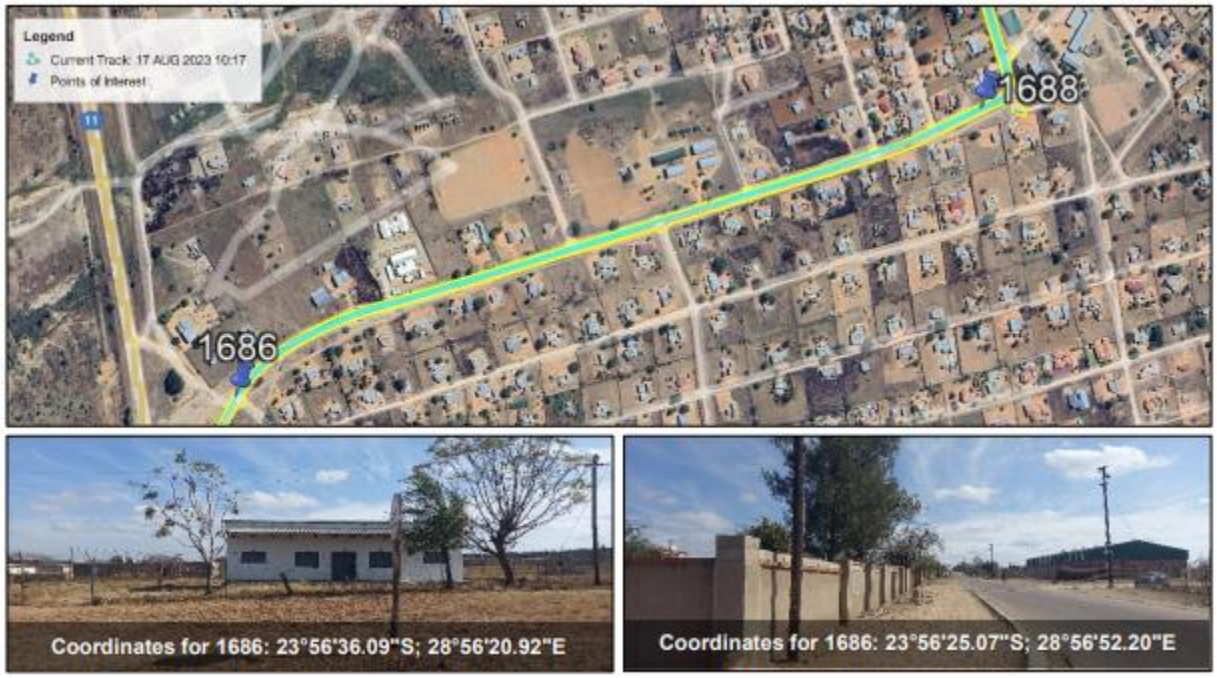


Figure 40: Site overview of the proposed access road (yellow outline) with reference GPS coordinates. Specialist's tracks indicated by the blue line.

The proposed WTW, however, is in degraded bushveld vegetation where overgrazing, frequent fires, rubble dumping, etc., have lowered the sensitivity of the habitat for both floral and faunal communities. Refer to **Figure 41**.

Figure 41: Site overview of the proposed access road (yellow outline) and WTW (red outline) with reference GPS coordinates. Specialist's tracks indicated by the blue line.

The vegetation within the proposed WTW footprint has lost much of its integrity due to anthropogenic related influences (as afore mentioned). Despite recent fires, it was still evident that the grass sward was in a poor condition as seen with numerous patches of bare ground – an inevitable outcome of overgrazing. The herbaceous layer was absent at the time, but this was expected given the site verification taking place in winter; however, herbaceous species often recover slower (if at all) than grass species where overgrazing takes place, and thus it is highly likely that the herbaceous layer will remain sparse and species poor even during the rainy season. The woody component largely comprised of smaller/lower individuals with only a few mature woody species. Representative photographs are provided in **Figure 42**.

The habitat associated with the proposed WTW may be under pressure from nearby anthropogenic activities, overgrazing, and altered fire regimes, but without any vegetation clearance within the preceding 10 years, the degraded bushveld meets the NEMA definition of indigenous vegetation (refer to some example species recorded within the focus area in **Figure 42**). The proposed access road, however, does not qualify as indigenous vegetation.

Figure 42: Some of the sparsely occurring woody species within the proposed WTW, comprising (from left to right): *Dombeya rotundifolia, Lopholaena coriifolia, Ormocarpum trichocarpum*, and *Vitex rehmannii*.

From a faunal perspective, common faunal species adapted to co-exist within environments of increased anthropogenic impacts were observed and can be expected to be found within the focus area. Common avifaunal species such as *Plocepasser mahali* (White-browed Sparrow-Weaver) and *Cinnyris mariquensis* (Marico Sunbird) were observed feeding on Aloe flowers, while other species such as *Crinifer concolor* (Grey Go-away-bird), *Urocolius indicus* (Red-faced Mousebird), *Dicrurus adsimilis* (Fork-tailed Drongo) etc. were observed perching on trees within the focus area. The presence of mammals was mostly restricted to domestic species like dogs, cats, donkeys, and cattle, but some common small mammal species like rodents and mongoose can be expected within the focus area. The abundance of rocks and rubble within the focus area created shelter for several common reptile species like the observed *Trachylepis varia* (Variable Skink) and *Myriopholis longicauda* (Long-tailed Thread Snake). The dominant insect orders observed were Lepidoptera, Coleoptera and Orthoptera. Arachnid and other invertebrate diversity and abundance were limited which can be attributed to the lack of vegetation and degraded nature of the focus area.

Figure 43: Left: *Myriopholis longicauda* (Long-tailed Thread Snake); Centre Left: *Trachylepis varia* (Variable Skink); Centre Right: *Eurocephalus anguitimens* (Southern White-crowned Shrike); Right: *Stephenia caldarena* (Black Tip Acraea).

The focus area itself, has been subjected to anthropogenic influences, and thus has little ecological value for fauna or flora. As such, the screening tool outcomes of medium sensitivities for the related biodiversity themes (animals, and plants) are **disputed**, while the low sensitivity of the terrestrial biodiversity theme is verified:

- No faunal species triggered by the screening tool were encountered during the site visit or are expected to be found within the focus area. *Dasymys robertsii* (Robert's Shaggy Rat, DD), triggered by the screening tool, prefers swamps and wet areas along rivers and streams which is absent within and around the focus area and therefore this species is not expected to be found within or impacted upon through this development. Based on the lack of suitable habitat conditions within the focus area, the medium sensitivity as assigned to the Animal Species Theme is **disputed** for the focus area and a low sensitivity instead verified;
- The screening tool triggered a medium sensitivity for sections of the proposed WTW and a small section of the proposed access road. The triggered VU sensitive species was not encountered on site and its preferred habitat, i.e., "wooded and relatively mesic places, such as the moister bushveld areas, coastal bush and wooded mountain kloofs", is not present in the focus area. No other red data listed floral species are anticipated to establish successfully within the focus area and an overall low sensitivity for the Plant Species Theme is verified for the entire focus area; and
- The screening tool indicated that the focus area is of low sensitivity from a terrestrial biodiversity point of view which was verified during the site visit.

B. Proposed Impact Management Actions

Given the overall low sensitivity verified for the focus area from a plant species, animal species, and terrestrial biodiversity theme perspective, together with the low likelihood of triggered species being present in the focus area, the direct impacts and associated edge effects arising from proposed activities for the Sekuruwe WTW and associated access road are anticipated to be low. Despite this, general mitigation measures that are to be implemented during construction within the focus area include the following:

- **Impacts**:
  - Habitat loss (fauna and flora) through clearance or removal of degraded vegetation for construction activities. This will result in reduced floral and faunal species richness and density within the proposed WTW. No habitat loss will occur within the proposed access road;
  - Habitat degradation beyond the footprint areas due to poorly managed edge effects, including 1) introduction of alien and invasive plant (AIP) species with construction vehicles, 2) ineffective rehabilitation of compacted areas, bare soils, or eroded areas, 3) potential inadequate design of stormwater management and erosion control, resulting in increased risk of erosion and additional degradation of faunal and floral habitat beyond the footprint area, and 4) potential fragmentation of natural habitat by transport vehicles not using designated roads;
  - Unlawful destruction/removal of protected floral species within the footprint areas due to failure to comply with national legislation regarding permit applications for the removal, destruction, and/or relocation of trees protected under the National Forest Act, 1998 (Act No. 84 of 1998) (NFA). Refer to recordings of the protected *Sclerocarya birrea* subsp. *caffra* (green dots) below:

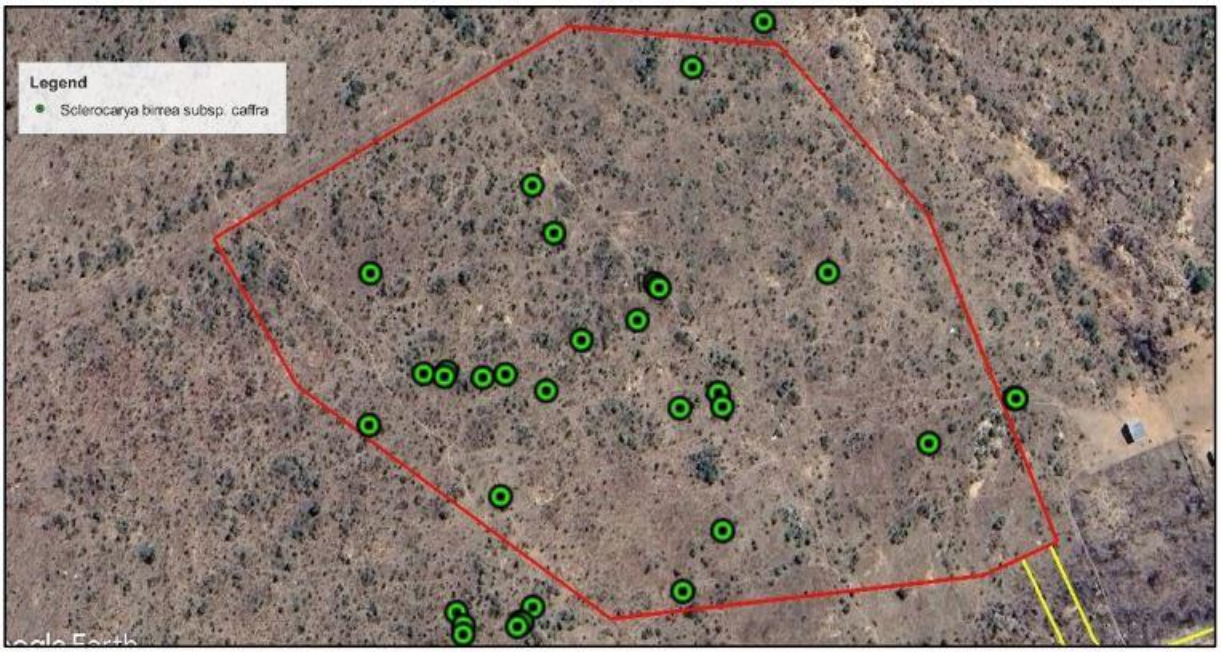


Figure 44: Recordings of the protected Sclerocarya birrea subsp. caffra (green dots).

- **Required Mitigation**:
  - Given that 1) an EDL is in close proximity to the proposed WTW (SAS 23-1135), and 2) the proposed WTW is within an area connected to a larger expanse of natural habitat, all footprint areas should remain as small as possible, and the boundaries of the footprint areas must be clearly defined so to ensure that all activities remain within defined footprint areas. Moreover, it must be

ensured that, as far as possible, all proposed infrastructure, including temporary infrastructure, is placed outside of natural habitat;

- As part of rehabilitation activities following the construction of the WTW, ensure that a vegetation layer is reinstated and maintained around the proposed WTW to promote soil health and vegetation establishment, to reduced habitat fragmentation, and to provide resources for fauna. In this regard, the use of indigenous plants from the reference vegetation type is recommended for best biodiversity outcomes (e.g., planting trees such as *Dombeya rotundifolia, Sclerocarya birrea susbp. caffra, Searsia leptodictya, Terminalia sericea*, and *Vitex rehmannii*);
- No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed as a result of the construction activities should be disposed of at an appropriate registered dump site away from the development footprint; o Stormwater runoff should be adequately managed, notably how and where it is discharged into the receiving environment;
- Control invasive plant species throughout the life of the project. Specific mention in this regard is made of listed invasive species as per the NEMBA Alien species lists, 2020, in line with the NEMBA Alien and Invasive Species Regulations (2020). All cleared plant material must be disposed of at a licensed waste facility which complies with the legal standards, or a garden refuse site; and o Prior to site clearing, for all NFA-protected tree species within the footprint area (i.e., *Sclerocarya birrea* subsp. *caffra*), permit applications must be applied for their removal. Permits should be obtained from DFFE.

The table below gives an overview of the impact assessment for the proposed project.

Table 34: Impact assessment overview for the proposed project.

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Loss of Floral Habitat and Floral Diversity during construction (i.e., removal of vegetation and surface grading across the footprint areas)	Medium-term	Local	Low - negative	Slightly detrimental	Certain	Moderate - negative	**Given that 1) an ephemeral drainage line (EDL) is in close proximity to the proposed WTW (SAS 23-1135), and 2) the proposed WTW is within an area connected to a larger expanse of natural habitat, all footprint areas should remain as small as possible, and the boundaries of the footprint areas must be clearly defined so to ensure that all activities remain within defined footprint areas. Moreover, it must be ensured that, as far as possible, all proposed infrastructure, including temporary infrastructure, is placed outside of natural habitat	Medium-term	Site-specific	Low - negative	Slightly detrimental	Certain	Low - negative
Loss of Floral SCC during construction (i.e., removal of vegetation and surface grading across the footprint areas)	Medium-term	Local	Low - negative	Slightly detrimental	Unlikely	Very low	**No threatened (red data listed) floral species will be impacted by the proposed development. The findings of the site inspection verify the screening tool outcome of a low sensitivity for the Plant Species Theme within the focus area and disputes the sections of medium sensitivity as identified by the screening tool.	Short-term	Site-specific	Low - negative	Negligible	Very unlikely	Very low
Loss of protected floral species (unlawful destruction/removal of protected floral species within the footprint areas)	Medium-term	Local		Moderately detrimental	Certain	Moderate - negative	**Prior to site clearing, for all NFA-protected tree species within the footprint area (i.e., *Sclerocarya birrea* subsp. *caffra*), permit applications must be applied for their removal. Permits should be obtained from DFFE.	Medium-term	Site-specific	Low - negative	Slightly detrimental	Certain	Low - negative

Degradation of surrounding floral and faunal communities during operational and maintenance phase (i.e., poorly managed edge effects.	Long-term	Local	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative	**As part of rehabilitation activities following the construction of the WTW, ensure that a vegetation layer is reinstated and maintained around the proposed WTW to promote soil health and vegetation establishment, to reduced habitat fragmentation, and to provide resources for fauna. In this regard, the use of indigenous plants from the reference vegetation type is recommended for best biodiversity outcomes (e.g., planting trees such as Dombeya rotundifolia, *Sclerocarya birrea* susbp. *caffra, Searsia leptodictya, Terminalia sericea*, and *Vitex rehmannii*). **No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed as a result of the construction activities should be disposed of at an appropriate registered dump site away from the development footprint. **Stormwater runoff should be adequately managed, notably how and where it is discharged into the receiving environment. **Control invasive plant species throughout the life of the project. Specific mention in this regard is made of listed invasive species as per the NEMBA Alien species lists, 2020, in line with the NEMBA Alien and Invasive Species Regulations (2020). All cleared plant material must be disposed of at a licensed waste facility which complies with the legal standards, or a garden refuse site.	Long-term	Local	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative
Loss of Faunal Habitat and Diversity during construction (i.e., removal of vegetation and surface grading across the footprint areas, fauna being displaced due to construction activities etc.)	Medium-term	Local	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	**Given that 1) an ephemeral drainage line (EDL) is in close proximity to the proposed WTW (SAS 23-1135), and 2) the proposed WTW is within an area connected to a larger expanse of natural habitat, all footprint areas should remain as small as possible, and the boundaries of the footprint areas must be clearly defined so to ensure that all activities remain within defined footprint areas. Moreover, it must be ensured that, as far as possible, all proposed infrastructure, including temporary infrastructure, is placed outside of natural habitat.	Medium-term	Site-specific	Moderate - negative	Slightly detrimental	Very likely	Low - negative
Loss of Faunal SCC during construction (i.e., removal of vegetation and surface grading across the footprint areas)	Medium-term	Local	Low - negative	Slightly detrimental	Unlikely	Very low	**No SCC is anticipated to be found within the focus area. The findings of the site inspection dispute the screening tool outcome of a medium sensitivity for the Animal Species Theme and verifies a low sensitivity instead.	Medium-term	Site-specific	Low - negative	Slightly detrimental	Very unlikely	Very low

C. Conclusion and Recommendations

No significant biodiversity features are associated with the project area. The probability of threatened or rare floral and / or faunal species occurring or establishing viable populations on site is deemed low. This can be attributed to the already transformed nature of the proposed access road and the degraded condition of the proposed WTW. Proximity to several anthropogenic influences (frequent fire, rubble and waste dumping, overgrazing, settlements encroaching into the site, etc.) further reduce habitat integrity and suitability for the establishment of threatened or rare fauna and flora. Given the above, the site assessment has verified low sensitivities for the animal species theme, plant species theme, and terrestrial biodiversity themes. Compliance statements for each of these themes are provided below:

- **Animal Species Compliance Statement:** The findings of the site inspection dispute the screening tool outcome of a medium sensitivity for the Animal Species Theme and verifies a low sensitivity instead. An overall low likelihood of faunal species of conservation concern within the focus area is apparent;
- **Plant Species Compliance Statement:** The findings of the site inspection verify the screening tool outcome of a low sensitivity for the Plant Species Theme within the focus area and disputes the sections of medium sensitivity as identified by the screening tool. The likelihood of floral species of conservation concern establishing within the focus area is low; and
- **Terrestrial Biodiversity Theme Compliance Statement:** The findings of the site inspection verify the screening tool outcome of a low sensitivity for the Terrestrial Biodiversity Theme.

Development activities within the focus area are not anticipated to result in the loss of sensitive floral species, nor will it result in the loss of significant or important faunal habitat. It is, however, recommended that mitigation

measures (as presented in section 6 of the Terrestrial Biodiversity compliance report) and general good housekeeping be in place to counter the potential for edge effects.

3.12. AIR QUALITY IMPACTS (EHRCON, 2023)

EHRCON (Pty) Ltd (EHRCON) was commissioned to assess the air quality impacts associated with the proposed Sekuruwe WTW. The objectives of this study were to characterise and describe ambient emissions from the construction, operation, and rehabilitation of the proposed Sekuruwe WTW and to assess the impact on the health of the receiving community.

The assessment considered a review of the relevant health legislation, ambient air quality guidelines and standards. An overview was given of the prevailing meteorological conditions as well as available data on criteria air pollutant concentrations in the area. A process description and emission inventory were compiled, founded on current emission factors. An evaluation of the potential for human health and environmental impacts, centered on comparisons of modelled pollutant concentrations with relevant guidelines and standards was performed. An assessment of the contribution and outcome of the process on the current air quality, completed the study.

A. Model Results and Discussion

1. Construction/Rehabilitation Phase

Dispersion model output plots for dust deposition during the construction/rehabilitation phase of the project is reflected in **Figure 45** below. The results for the Sekuruwe WTW were evaluated in terms of current South African National Standards and are presented for the project independently (i.e., incremental).

NO_2, SO_2 and CO emissions (vehicle tailpipe emissions) were not quantified for these phases of the project due to the relatively low expected risk and since an acceptable construction/rehabilitation vehicle inventory could not be established at this stage. Predicted incremental dust deposition rates during construction/rehabilitation is expected to remain at current levels at all the closest receivers identified as shown in **Figure 45**. Maximum onsite deposition rates are expected to be 842mg/m^2/day. Incremental daily and annual average $PM_{10/2.5}$ concentrations as a result of construction/rehabilitation will probably remain below 10% of the relevant standards at the closest sensitive receivers**.**

Table 35 below is a summary of the impacts and the proposed mitigation measures of the proposed Sekuruwe WTW during the construction and/or rehabilitation phase.

Table 35: TSP, PM_{10}, $PM_{2.5}$ and Gaseous Emissions During Construction/Rehabilitation

IMPACT DESCRIPTION: TSP, PM_{10}, $PM_{2.5}$ and Gaseous Emissions During Construction/Rehabilitation.				
Predicted for project phase:	Pre-construction	Construction	Decommissioning	
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact could continue for up to 2 years.	Consequence: Slightly detrimental	Significance: Low - negative
Extent	Local	The impact could extend across the site boundary to nearby properties.		
Intensity	Low - negative	Negligible damage to natural or social systems or resources.		

Probability	Fairly likely	Impact has occurred numerous times in a similar environment and with a similar type of development and could very conceivably occur.		
MITIGATION:				
Mitigation through administrative control and best industry practice.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Short-term	Impact could continue for up to 2 years.	Consequence: Negligible	Significance: Very low
Extent	Local	The impact could extend across the site boundary to nearby properties.		
Intensity	Negligible	Negligible damage to natural or social systems or resources.		
Probability	Fairly likely	Impact has occurred numerous times in a similar environment and with a similar type of development and could very conceivably occur.		

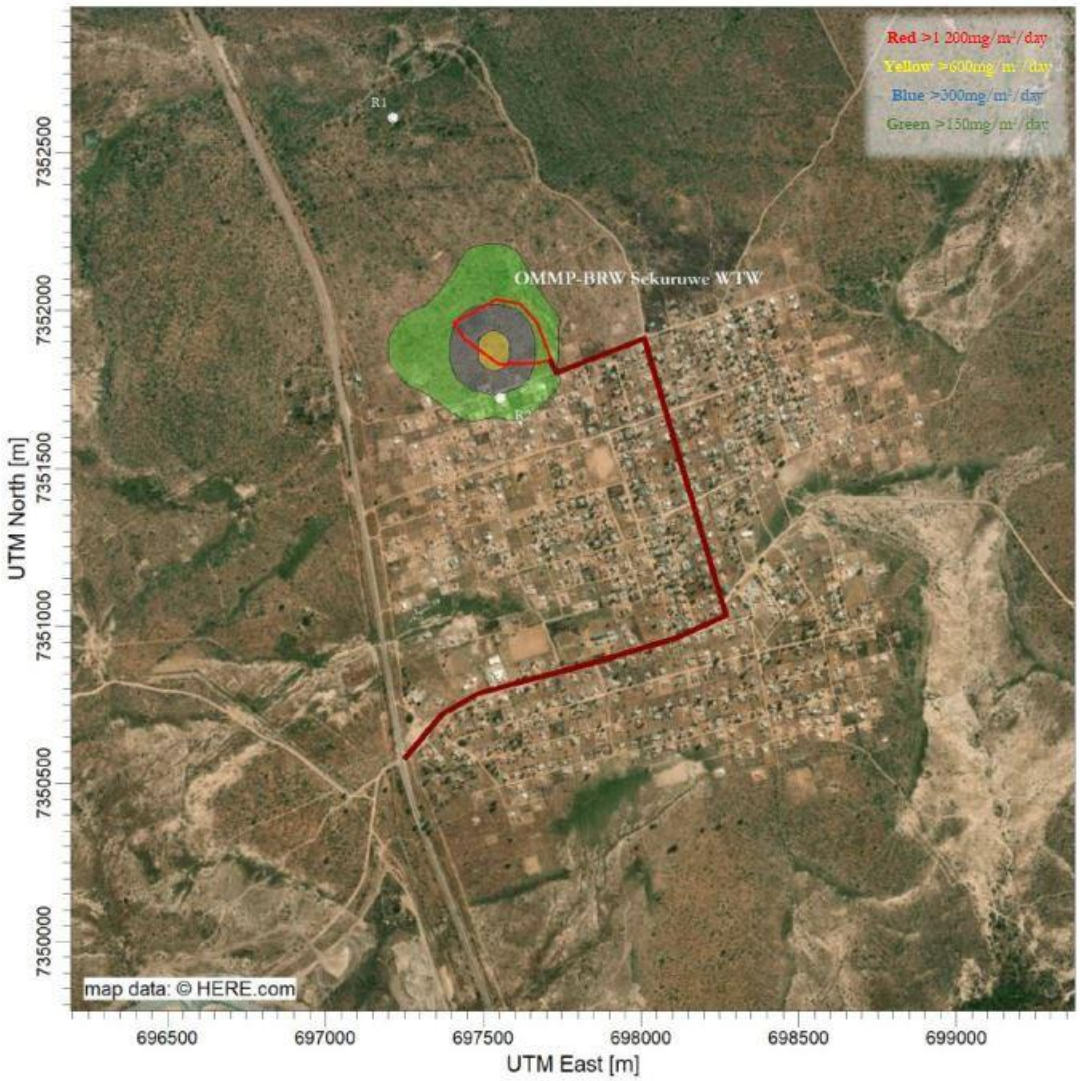


Figure 45: Daily Average Dust Deposition Rate – Construction/Rehabilitation

2. Operational Phase

The annual dispersion output plot for chlorine concentrations during normal operations are reflected in **Figure 46**. NO_2, SO_2 and CO emissions (vehicle tailpipe emissions) were not quantified for this phase of the project due to the relatively low expected risk and since an acceptable operational vehicle inventory could not be established at this stage.

Predicted incremental annual average chlorine concentrations will probably be above 25% of the adopted guideline at the nearest receivers south of the site. The disinfection process, utilising chlorine gas, will most likely be the largest source of ambient pollution (67.1%), followed by vehicle transport emissions and material handling (30.9%). Incremental daily and annual average total suspended particulates and $PM_{10/2.5}$ concentrations during normal operations will probably remain below 10% of the relevant standards at the closest sensitive receivers.

Table 36 and **Table 37** below summarizes the impacts and proposed mitigation measures for the operational phase.

Table 36: TSP, PM10, and PM2.5 During Operations.

IMPACT DESCRIPTION: TSP, PM_{10}, and $PM_{2.5}$ During Operations.				
Predicted for project phase:	Operation			
PRE-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact could continue for 6 to 15 years.	Consequence: Slightly detrimental	Significance: Low - negative
Extent	Site-specific	The impact will be limited to the site.		
Intensity	Low - negative	Negligible damage to natural or social systems or resources.		
Probability	Fairly likely	Impact has occurred numerous times in a similar environment and with a similar type of development and could very conceivably occur.		
MITIGATION:				
Mitigation through administrative control and best industry practice.				
POST-MITIGATION				
Dimension	**Rating**	**Motivation**		
Duration	Long-term	Impact could continue for 6 to 15 years.	Consequence: Negligible	Significance: Very low
Extent	Site-specific	The impact will be limited to the site.		
Intensity	Negligible	Negligible damage to natural or social systems or resources.		
Probability	Fairly likely	Impact has occurred numerous times in a similar environment and with a similar type of development and could very conceivably occur.		

Table 37: Gaseous Emissions During Operations.

IMPACT DESCRIPTION: Gaseous Emissions During Operations.		
Predicted for project phase:	Operation	
PRE-MITIGATION		
Dimension	**Rating**	**Motivation**

Duration	Long-term	Impact could continue for 6 to 15 years.	Consequence: Moderately detrimental	Significance: Low - negative
Extent	Local	The impact could extend across the site boundary to nearby properties.		
Intensity	Low - negative	Negligible to minor damage to natural or social systems or resources.		
Probability	Fairly likely	Impact has occurred numerous times in a similar environment and with a similar type of development and could very conceivably occur.		

MITIGATION:

Mitigation through administrative control, best industry practice and supplemented with engineering control measures.

POST-MITIGATION

Dimension	Rating	Motivation		
Duration	Long-term	Impact could continue for 6 to 15 years.	Consequence: Negligible	Significance: Very low
Extent	Local	The impact could extend across the site boundary to nearby properties.		
Intensity	Negligible	Negligible damage to natural or social systems or resources.		
Probability	Fairly likely	Impact has occurred numerous times in a similar environment and with a similar type of development and could very conceivably occur.		

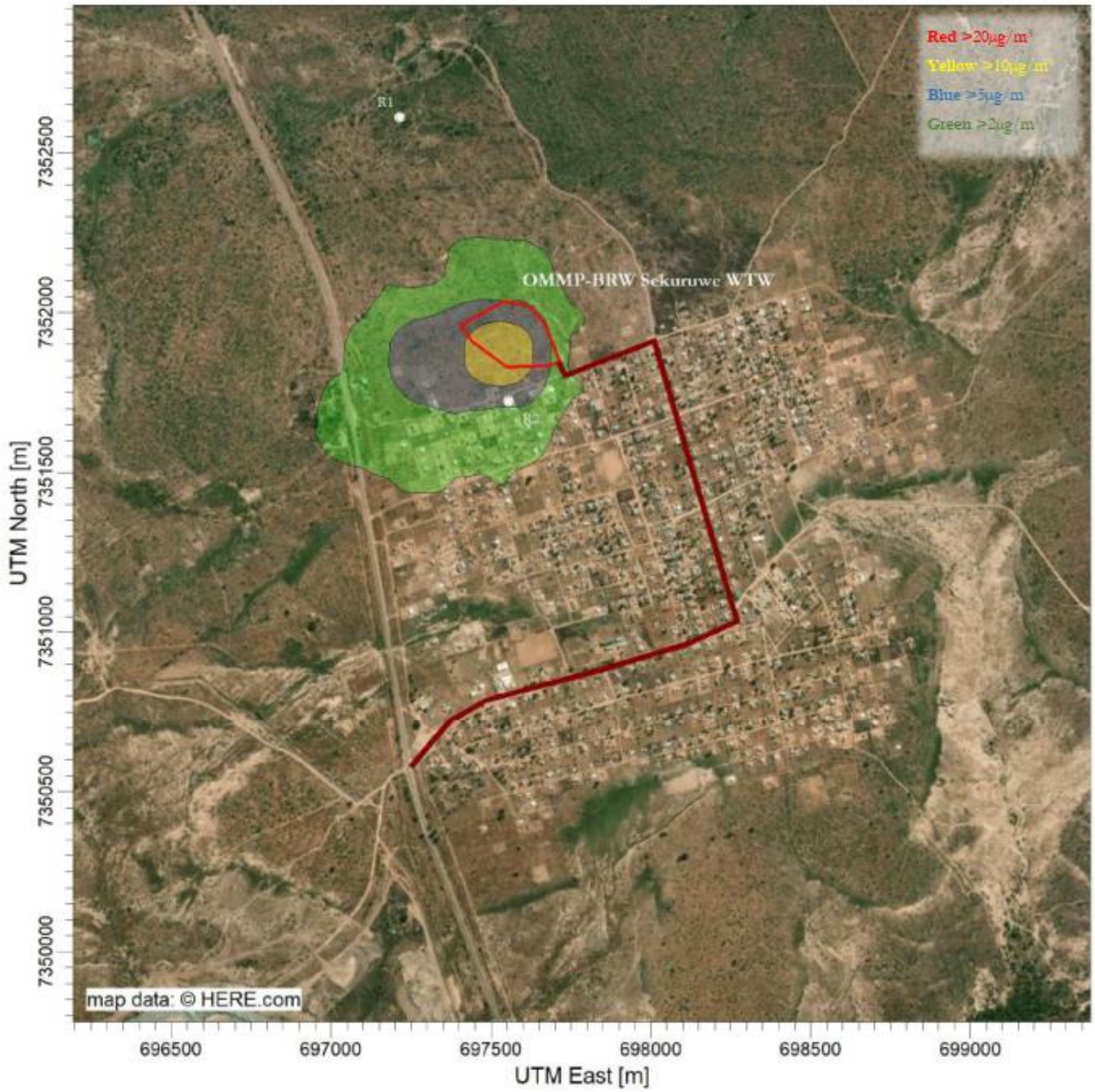


Figure 46: Annual Average Chlorine Concentration – Operations.

B. Conclusion and Recommendations

Administrative Measures

In view of the predicted ambient pollutant concentrations resulting from emissions from the Sekuruwe WTW, the following is recommended: An emissions inventory and modelling regime should be undertaken at least bi-annually throughout the life of the project, or if the capacity of the facility is increased dramatically.

The ultimate purpose of monitoring is not merely to collect data, but to provide information necessary to make informed decisions on managing and improving the environment. Monitoring fulfils a central role in this process, providing the necessary sound scientific basis for policy and strategy development, objective setting, compliance measurement against targets and enforcement action. However, the limitations of monitoring should be recognised. In many circumstances, measurements alone may be insufficient, or impractical for the purpose of fully defining

population exposure. No monitoring programme, however well-funded and designed, can hope to comprehensively quantify patterns of air pollution in both space and time. At best monitoring provides an incomplete, but useful, picture of current environmental air quality. Monitoring often needs to be used in conjunction with other objective assessment techniques, including modelling, emission measurement and inventories, interpolation and mapping.

Emissions Monitoring

In the initial stages of treatment hydrogen sulphide might be stripped from raw water by aeration. The concentrations of hydrogen sulphide can best be determined by sampling and analysing raw and post-aeration water.

Best Available Industry Techniques

Fugitive Emissions from Paved Surfaces:

The following measures are aimed at reducing fugitive dust emissions from paved surfaces:

- Construction integrity of all paved areas should be regularly inspected and frequently repaired if required.
- Control load size and set an acceptable speed limit for all onsite vehicles.
- Minimise travelling distance and unnecessary traffic through good site layout and process design.
- Measures which entail periodic removal of deposited material, i.e. broom and vacuum sweeping, may also be adopted to reduce dust generation.

The air quality impact study concludes the following:

- A total emission rate of 0.30 gram per second was calculated for operations.
- The disinfection process, utilising chlorine gas, will most likely be the largest source of ambient pollution (48.9%), followed by vehicle transport emissions (47.9%).
- Particulate matter comprises approximately 51.0 % of the pollution load. PM_{10} is the criteria pollutant of concern and contributes about 7.6% of the pollution load. Total suspended particulates and $PM_{2.5}$ contribute 41.4% and 1.8% respectively.
- Predicted incremental dust deposition rates during construction/rehabilitation are expected to remain at current levels and at all the closest receivers. Incremental daily and annual average $PM_{10/2.5}$ concentrations will probably remain below 10% of the relevant standards.
- Predicted incremental dust deposition rates during operations are expected to remain at background levels at all sensitive receivers beyond the project boundary.
- Predicted incremental annual average chlorine concentrations will probably exceed 25% of the adopted guideline at the nearest receivers south of the site.
- Incremental daily and annual average total suspended particulates and $PM_{10/2.5}$ concentrations during normal operations will probably remain below 10% of the relevant standards at the closest sensitive receivers.
- The incremental impact of all pollutants during construction/rehabilitation is expected to be negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels. The incremental impact of particulate pollutants during normal operations is expected to be negligible.
- Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.
- The incremental impact of gaseous pollutants during normal operations is expected to be minor.

- Current industry standard techniques should be maintained and supplemented with administrative control measures and engineering control to maintain the residual impact at the nearest sensitive receivers at current background levels.
- Ambient monitoring should be used in combination with modelling and emission inventory to assess the effectiveness of control measures at source and receivers, on an annual basis.
- Monitoring of ambient air quality will assist with effective air quality management and open communication to all stakeholders.

No-go alternative (compulsory)

The LEDET stresses the consideration of the "no development/no-action" option in cases where a proposed development is envisaged to have significant negative environmental impacts, or where such impacts cannot be mitigated against effectively or satisfactorily. The Integrated Environmental Management (IEM) procedure suggests that the "no action" option should be considered as an alternative. This option is normally considered during a full EIA where significant negative environmental impacts are expected or if the proposed site is considered to be ecologically sensitive or unique.

Due to the limited extent of the proposed activity, the impact upon the environment will be minimal (after mitigation measures are implemented). The No-go alternative is thus not a feasible alternative as the negative impacts does not outweigh the positive impacts that will result by the development of the proposed Sekuruwe WTW (See Assessment of Alternatives attached as **Appendix D**). The proposed site does not have any environmental constraints. According to the SIA, the overall impact associated with not proceeding with the proposed WTW would entail the failure of the OMM programme to fully align with the country's plan on infrastructure development, especially the provision of potable water to social users. Specifically, the selected doorstep communities front of the Northern limb (as per the Water Management Master Plan) will not have access to potable water. The other anticipated positive and negative social impacts likely to be induced by the proposed WTW (as identified in the SIA) will not be realised.

On the other hand, the Defence specialist opined that while the "No Go" option may seem like a cost-saving measure or a way to avoid potential environmental impacts, it is likely not a feasible alternative for the Sekuruwe project. The region's water needs, economic considerations, environmental responsibilities, legal obligations, and long-term planning all point to the importance of proceeding with the project to ensure a sustainable and prosperous future for the community.

Other factors that can contribute to this option include opposing interested and affected parties with valid points to go against the proposed development as well as non-compliance with legislations required by organs of sate. No objections have been received thus far as we are still to advertise and have the public participation meetings.

Our views as ZNJV, independent EAPs are that the proposed area is suitable for the proposed development based on that the operational aspects of the activity will contribute towards improving the general livelihood of the local communities, more importantly, it will address the goals of the MLM, which include, but are not limited to, the responsibility for realising the right to access basic water services and ensuring the progressive realisation of the right to basic water services.

~~**Alternative B**~~

~~**Alternative C**~~

For more alternatives please continue as alternative D, E, etc.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	**YES**	~~NO~~

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the department in respect of the application:

The EMPr for this project, appended in **Appendix F**, must be implemented, and adhered to by the Applicant, the Project Implementer, and the appointed contractor (also see **Appendix D**) so that the anticipated impacts can be mitigated and minimised accordingly.

Is an EMPr attached?	**YES**	~~NO~~

The EMPr must be attached as Appendix F.

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Other information

SECTION G: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, **Deon Esterhuizen** declare that I –

(a) act as the independent environmental practitioner in this application;

(b) do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;

(c) do not have and will not have a vested interest in the proposed activity proceeding;

(d) have no, and will not engage in, conflicting interests in the undertaking of the activity;

(e) undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006;

(f) will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;

(g) will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the Department in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the Department may be attached to the report without further amendment to the report;

(h) will keep a register of all interested and affected parties that participated in a public participation process; and

(i) will provide the Department with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

Zutari Ndodana Joint Venture (ZNJV)

Name of company:

Date: 02/10/2023