



BASIC ASSESSMENT PROCESS
for
**THE PROPOSED GA-PILA VILLAGE SANITATION UPGRADE IN THE
MOGALAKWENA LOCAL MUNICIPALITY, LIMPOPO PROVINCE**

DRAFT BASIC ASSESSMENT REPORT

Public Review Period:
28 July 2022 to 29 August 2022

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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:

NEAS Reference Number:

Date Received:

Due date for acknowledgement:

Due date for acceptance:

Due date for decision

Kindly note that:

(For official use only)

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:-

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

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

PROJECT DETAILS

Reference #: Not yet assigned

Title: Basic Assessment Process for
Proposed Ga-Pila Village Sanitation Upgrade in the
Mogalakwena Local Municipality, Limpopo Province

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Client : Rustenburg Platinum Mines Limited

Report Status : Draft Basic Assessment Report for Public Review

Review period **The 30-day period for review is from**
28 July 2022 to 29 August 2022

DOCUMENT CONTROL

PREPARED BY:



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(MA Environmental Management)

REVIEWED BY:



Karthigesan Govender (Project Manager)
(Pr.Sci.Nat. No: 400049/12)

DECLARATION

Envirovolution Consulting (Pty) Ltd was contracted by Bosch Projects (on behalf of Rustenburg Platinum Mines Limited) as the independent environmental consultant to undertake the Environmental Basic Assessment process for the proposed project. Envirovolution Consulting (Pty) Ltd is not a subsidiary of, or affiliated to Rustenburg Platinum Mines Limited. Furthermore, Envirovolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

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EAP Qualifications	Msc Environmental Management		
EAP Registrations/ Associations	Registered with the Environmental Assessment Practitioners Association of South Africa (No: 2020/2574)		

Details of the EAP's expertise to carry out Basic Assessment procedures

- Cheda Sheila Bolingo, the principle author and Environmental Assessment Practitioner (EAP) responsible for this project holds an Msc degree in Environmental Management with 10 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- Karthigesan Govender – the project manager for this project is a registered Professional Natural Scientist and holds an Honours Degree in Botany. He has over 19 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIAs for several diverse projects across the country.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix G1** for CVs):

III. SPECIALIST'S DETAILS

Name of Specialist	Title of specialist report/s as attached in Appendix G	Date issued
Antoinette Bootsman of Limosella Consulting	Aquatic Biodiversity Assessment	June 2022
Antoinette Eyssell-Knox of Dimela-Eco Consulting	Terrestrial site verification and compliance statement (Vegetation)	June 2022
Barbara Kasl	Terrestrial Fauna Compliance Statement	June 2022
Johnny van Schalkwyk	Phase 1 Cultural Heritage Impact Assessment	July 2022

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ABBREVIATIONS

AAP	Anglo-American Platinum Limited
BAR	Basic Assessment Report
BBLM	Bela-Bela Local Municipality
DBAR	Draft Basic Assessment Report
DHSWS	Department of Human Settlements, Water and Sanitation
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
FBAR	Final Basic Assessment Report
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LIHRA	Limpopo Heritage Resources Authority
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
PIA	Palaeontological Impact Assessment
RPM	Rustenburg Platinum Mines Limited
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SMP	Stormwater Management Plan
WDM	Waterberg District Municipality
WWTP	Waste Water Treatment Plant
WULA	Water Use License Application

SECTION A: ACTIVITY INFORMATION

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

YES	
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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 detail¹:

The Proposed Ga-Pila Village Sanitation Upgrade in the Mogalakwena Local Municipality, Limpopo Province

1.1 Background

Rustenburg Platinum Mines Limited (“RPM”), a wholly owned subsidiary of Anglo-American Platinum Limited (AAP) initiated a process for the expansion of the Mogalakwena Platinum Mine during the late 1990’s. This led to the resettlement of communities that would potentially be impacted by the expansion and its associated activities. Hence, the village of Ga-Pila was resettled to its present position. The original contractor at the time installed a solids free sanitation system in the resettled village which consisted of septic tanks for each household connected to a network of collection systems through which the effluent flowed to sewage ponds situated close to the village.

The specification of the initial pipe installation is not known. The septic tanks installed were made of plastic. As a result, through the years the build integrity of the septic tanks and the efficiency of the whole system have deteriorated to such an extent that interventions are essential and critical. The current system poses a high health risk to the community.

A desktop study of the Ga-Pila Village current sanitation system (“Solids Free System”) was undertaken in July 2021. A full water-borne sewer system was recommended as an alternative and sustainable sanitation solution, considering the local site factors. Currently there are approximately **1020 households** in the growing Ga-Pila community, of which about 750 of these had the Solids Free System installed during the resettlement phase. After studying the available information, it was concluded that the existing sanitation network is as a “solids-free sewer”, “small-bore system” or a “common sewage drain” system.

The current sanitation system in the erf / stands consist of the following (refer to **Figure 1**):

- The three (3) bedroom houses have one (1) bathroom with a flushing toilet and a kitchen that discharge wastewater to the existing septic tank via a 110 mm diameter pipe.
- The “Calcamite” plastic septic tank has a capacity of 1 500 l and consists of two (2) chambers, air vent, and overflow.
- The overflow is a 75/63 mm diameter pipe that transfers the sewage to the mid-block conveyor system. The system is therefore a Solids-free System or a Small-Bore System.

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.

- The septic tank is service by removing the sludge and scum from the first chamber. A honey sucker truck with a seven (7)-kilolitre capacity is used to remove the sludge and discharges the sludge at the sewage / wastewater pond treatment facility.

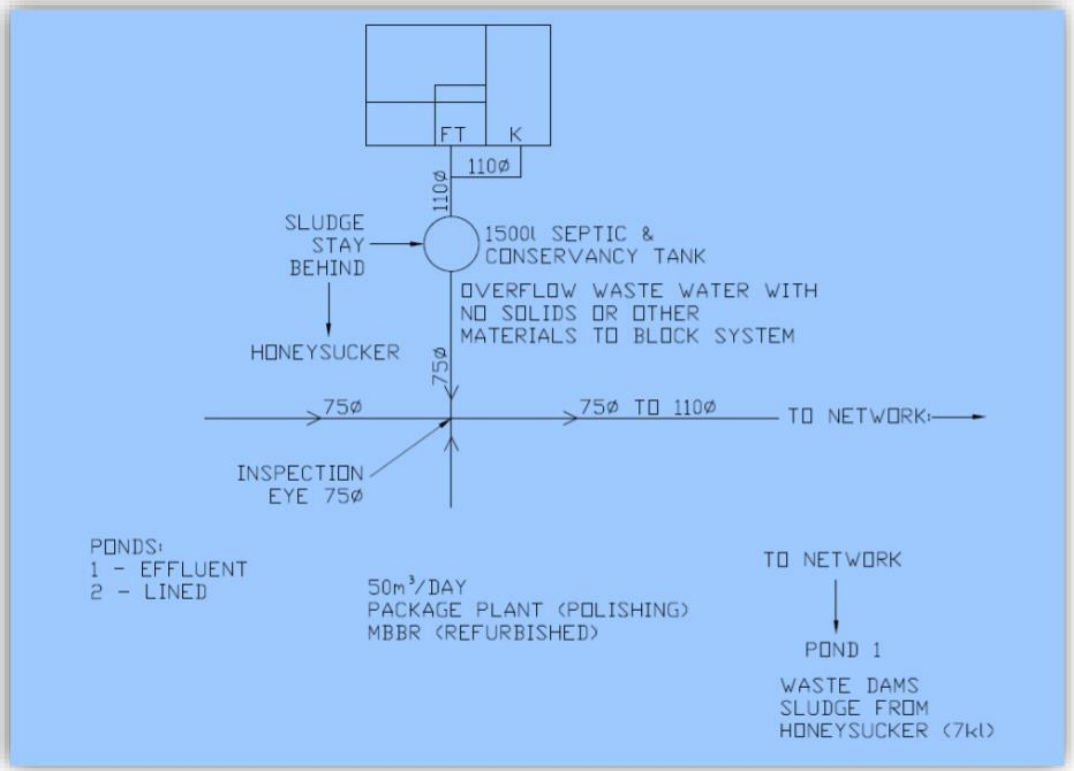


Figure 1: Stand Schematic Layout

The existing mid-block conveyer system consists of a 75 mm diameter to a 110 mm diameter pipe network that discharges the sewage into the collector / internal network. The original design included an inspection eye where every stand connects to the mid-block pipelines. The extent of the collector / internal network is unknown as there is limited information currently available. The only manholes currently known is at the northern side of the Ga-Pila Village. (Refer to **Figure 2**).

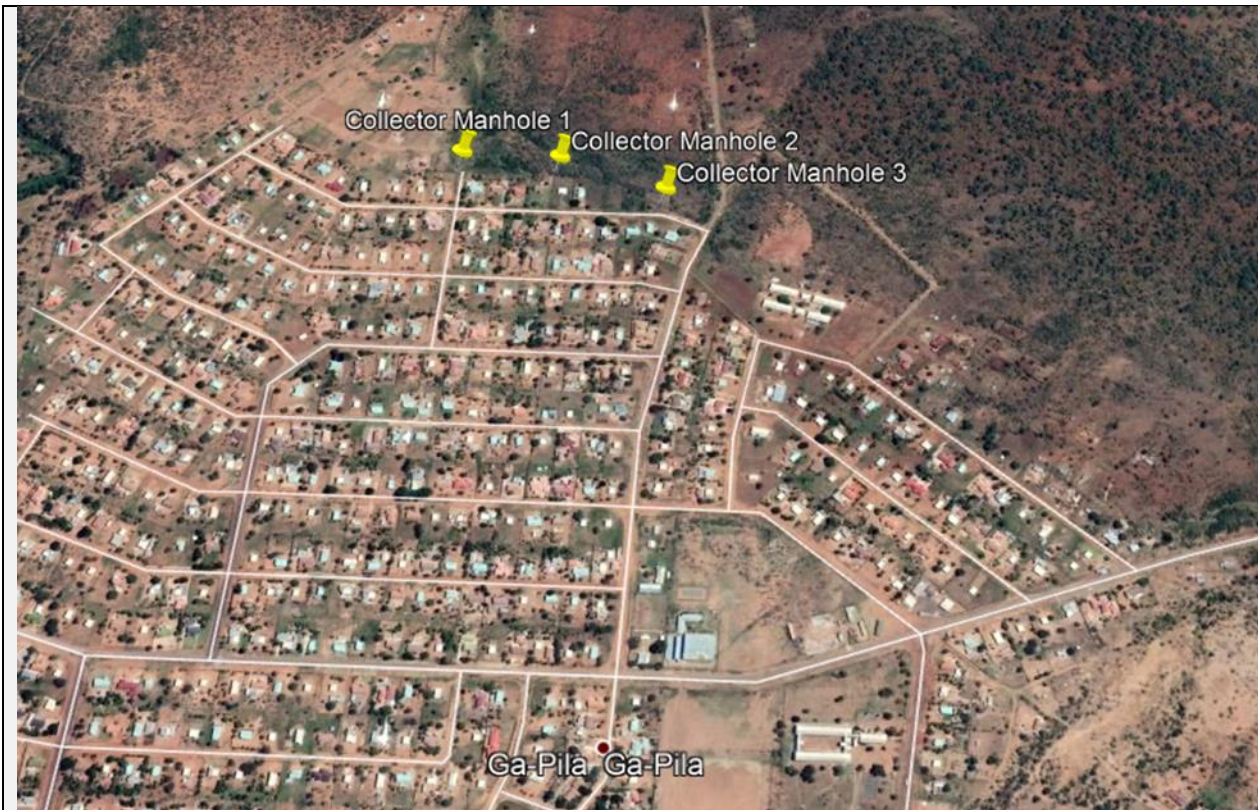


Figure 2: Collector Manhole Position

The manholes were opened, and it showed that the manholes are in a poor condition and that the existing pipe network could be compromised due to the evidence of the pipes having scale build-up & rust and therefore reducing the actual pipe diameter (refer to **Figure 3**). The extent of the bulk / outfall sewer network is unknown due to the limited information currently available. The only manholes known are at the treatment ponds and the position of the pipelines are estimated.



Figure 3: Manhole Picture

The **existing wastewater treatment facility** consists of the following:

- Pond A: The sewage / black water from the solids-free sanitation system is discharged via the piped network into the pond.
- Pond B: The sludge is removed from the households' septic tank via a honey sucker truck, transported to and discharged into the pond.
- 50 m³ per day MBBR (Moving Bed Biofilm Reactor) package treatment plant. The MBBR is a complete mix, continuous flow-through process which is based on the biofilms principle that combines the benefits of both the activated sludge process and conventional fixed film systems without their disadvantages. The MBBR process utilizes floating plastic carriers (media) within the aeration tank to increase the number of microorganisms available to treat the wastewater. A film of biological organisms builds up on the media and these digest the biological matter in the sewage.

Please refer to appendix G3 for a full feasibility study.

1.2 Locality of study site

The Ga-Pila sanitation site is located within the Mogalakwena Local Municipality in the Central part of the Limpopo Province, approximately 25 kilometres northwest of Mokopane and approximately 85 kilometres west-southwest of Polokwane. Access to the site is via the R518.

Figure 4 shows the location of Ga-Pila Village in the Mogalakwena Municipal jurisdiction area in the Waterberg District of the Limpopo Province.

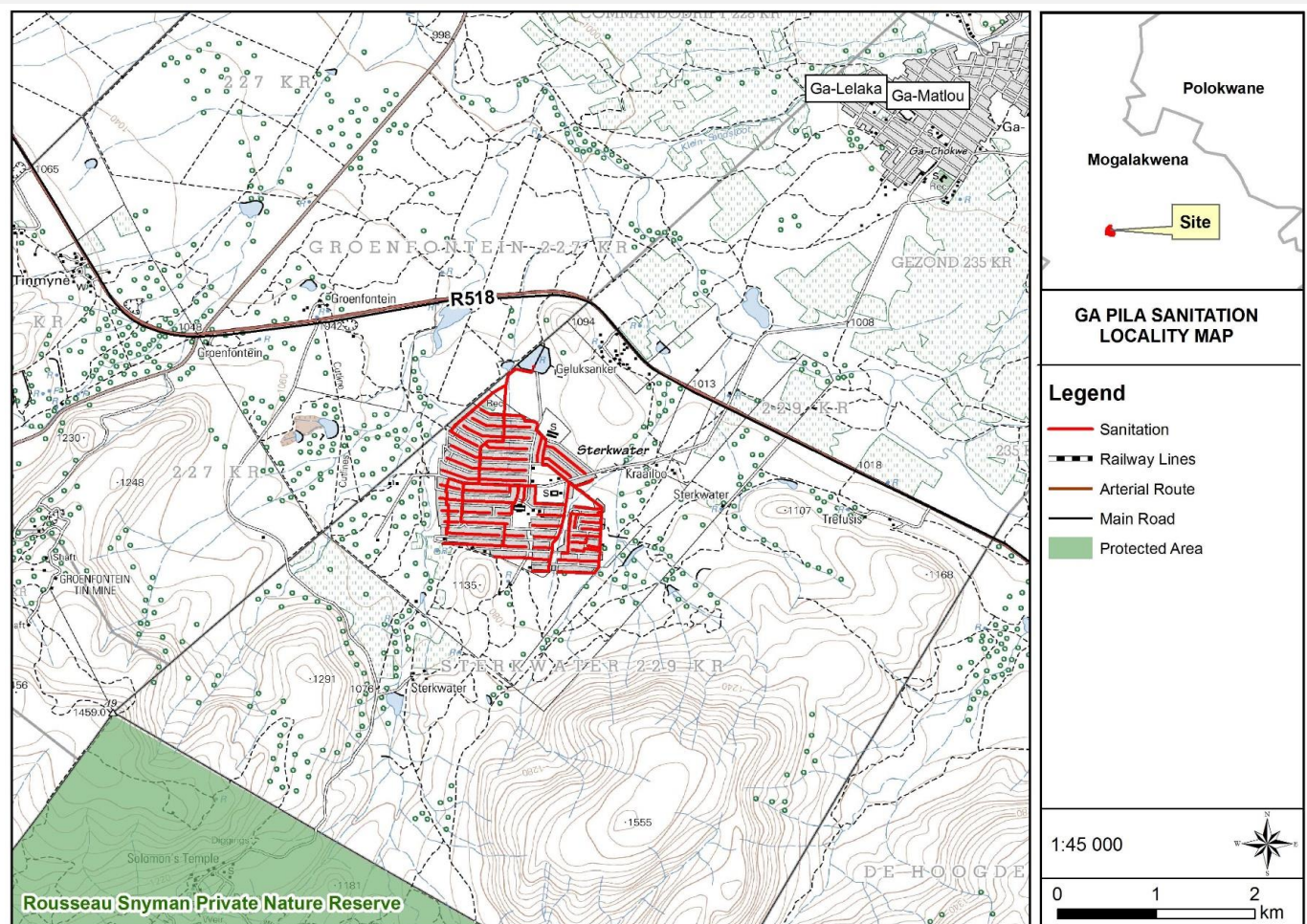


Figure 4: Locality Map

1.3 Scope of Works

The objective of the project is to improve the sanitation infrastructure in Ga-Pila village by replacing all the plastic septic tanks with a more sustainable full water-borne sanitation system, this approach proposes a sustainable sanitation solution for the Ga-Pila community. The aim of the assignment is to provide a sustainable conventional gravity waterborne sewerage and wastewater treatment system in the Ga-Pila village.

The construction of a water borne sanitation system inclusive of various Element/ Infrastructure include:

- Sewer Reticulation Networks - Proposed sewer reticulation location within roadway servitude for various levels of service;
- Outfall Sewer Pipelines – Required future sewer flow capacities from AAP and stakeholders
- Wastewater Treatment Package Plant

1.4 Proposed Design Standards / Criteria

Over and above the design standards that may be specified by the Local Municipality, below is the standards proposed to be used in the designs are shown in **Table 1**. The plant will service a village of mine workers in Limpopo – 1028 low income households or 'stands'. They have used 650mg/L COD as the Domestic Effluent strength for the design shown in **Table 2**.

Table 1: Design Standards / Criteria:

PARAMETER	ELEMENT	GUIDELINES
SEWER RETICULATION AND OUTFALL SEWER LINES:		
Minimum Pipe diameter	Municipal sewers	160 mm (nominal diameter)
	House Connections	110 mm (nominal diameter)
Minimum Velocity at full flow	Normal minimum	0,75 m/s at full flow
	Absolute minimum	0,6 m/s at full flow
Peak Factor	Residential/ business	2.5
Stormwater Infiltration		0.04 l/min/m pipe length/m dia.
Pipe capacity	Flow level in pipe as percentage of diameter	70 % at design flow
Minimum Gradients for Pipes (nominal dia. and 1/2D flow and $v = 0.82\text{m/s}$)	160 mm ND.	1 : 100
	200 mm ND	1 : 200
	250 mm ND	1 : 240
	315 mm ND	1 : 300
Hydraulic Calculations	Manning Equation	$n = 0,013$
Pipe Materials	All pipes	PVC-U Class 400 to SANS 1601 Only PE pipeline used in dolomitic regions
Location of Sewers		1.2 m from the erf boundary
Connections	For Stands	110 mm PVC-U
Minimum depth to invert	Mid blocks	1 000 mm (min)
	Road reserves	1 000 mm (min)
Manholes	Spacing	80-110 m maximum.

Table 2: Raw wastewater design criteria

Sanitation Demand Calculation (1028 Stands: 2021)		
Description	Unit	Notes
Demand per day (ML/d)	0,393	(No peak flow factor)
Demand per day (KL/d)	392,900	
Average Daily Flow (KL/d)	333,965	(85% of water demand)
Peak Flow (KL/d)	667,930	(Peak factor – 2.0)
Average Daily Flow (L/s)	4,547	
Peak Flow (L/s)	10,459	
Waste Water Treatment Package Plant size	335	0.85 x 393kl/day = say 335Kl/day

1.5 Listed Activities

In terms of Sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as amended, and as read with the Environmental Impact Assessment (EIA) Regulations of Government Notices R 324 to 327 in Government Gazette 40772 of 07 April 2017, the development will trigger a Basic Assessment process as per the activities listed in **Table 3** below.

Table 3: Listed Activities

Listed activities	Description of project activity that triggers listed activity
<p>GNR 327 Listing Notice 1 (7 April 2017) Activity 12:</p> <p>The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more where such development occurs, — (a) Within a watercourse;</p>	<p><i>The proposed upgrade of the Ga Pila Village Sanitation requires the construction infrastructure (ie Sewer Pipes) within an existing drainage system which runs through the proposed site.</i></p>
<p>GNR 327 Listing Notice 1 (7 April 2017) Activity 19:</p> <p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</p>	<p><i>The proposed upgrade of the Ga Pila Village Sanitation requires the construction infrastructure (ie Sewer Pipes) within an existing drainage system which runs through the proposed site.</i></p>
<p>GNR 324 Listing Notice 3 (7 April 2017) Activity 12:</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation</p>	<p><i>A clearance of an area of 300 square metres or more of indigenous vegetation is required for the project within the Critical Biodiversity Areas /Ecological Support Areas identified in the provincial Conservation Plan as well as</i></p>

<p>(e) In Limpopo:</p> <p>ii) Within critical biodiversity areas identified in bioregional plans; or</p>	<p><i>located within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.</i></p>
<p>GNR 324 Listing Notice 3 (7 April 2017) Activity 14: The development of:–</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs –</p> <p>a) within a watercourse;</p> <p>(e) In Limpopo:</p> <p>i. Outside urban areas:</p> <p>ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	<p><i>The proposed upgrade of the Ga Pila Village Sanitation requires the construction infrastructure (ie Sewer Pipes) within an existing drainage system within the Critical Biodiversity Areas /Ecological Support Areas</i></p>

The above listed activities may not commence without an Environmental Authorization from the Competent Authority (LEDET).

The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts associated with the proposed project are taken into consideration.
- Public Participation Process is conducted i.e. to afford any Interested and or Affected Parties (I&AP) sufficient opportunity to provide comments.
- Sufficient information is provided to decision makers in order to ensure an informed decision making.

The nature and extent of the proposed project are explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

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. **Table 4** below describes the alternatives being assessed in this report for the proposed project.

Table 4: Proposed Alternatives

No./ Alternative Type	Description
1. Site Alternatives	<ul style="list-style-type: none"> • The objective of the project is to improve the sanitation infrastructure in Ga-Pila village by replacing all the plastic septic tanks with a more sustainable full water-borne sanitation system, this approach proposes a sustainable sanitation solution for the Ga-Pila community. • The aim of the assignment is to provide a sustainable conventional gravity waterborne sewerage and wastewater treatment system in the Ga-Pila village <p>No site alternatives have been investigated for the proposed development for the above-mentioned reasons as the upgrade is needed at the said site.</p>
2. Design alternatives of sewage systems	<p><u>FIXED-FILM AERATION vs. ACTIVATED SLUDGE</u></p> <p>Most municipal sewage systems utilise an activated sludge process which is the most common process used in large sewage treatment systems. The activated sludge process is efficient but complex. There are several parameters which need to be controlled to produce the required treatment:</p> <ul style="list-style-type: none"> • Sludge age • Concentration • Oxygen levels • Inflows of food <p>Where skilled operators are not available these parameters are controlled with sophisticated probes and computers. In addition, the process produces large amounts of excess sludge which has to be disposed of.</p> <p>In simple terms, the activated sludge process is a soup of bacteria stirred and aerated continuously. Effluent is fed in and consumed by the bacteria which grow and reproduce – producing an ever-increasing population of bacteria (sludge). This bacterial population has to be retained and regulated. This involves recycling and wasting sludge from the clarifier. The wasted sludge has to be disposed of by drying or digestion – both of which have associated odour problems. In addition, any high flows will wash the bacterial soup out through the system.</p> <p>The fixed film process utilises the same bacteria, but they are provided with a large surface area (matrix) on which to fix. The oxygenated effluent is passed over the matrix and the bacteria extract the nutrients from the water, thus cleaning it. Because the bacteria are fixed there is no need for recycling of sludge and the process produces much less sludge than the activated sludge process. The sludge that is produced is returned to the anaerobic pre-treatment section at the head of the works to be digested – giving water, carbon dioxide and methane as by-products. This recycle to an anoxic zone is used to release Nitrogen, derived from the breakdown of Ammonia, to the air. A pump on a timer is all that is needed for the control of this process.</p> <p>The preference in remote areas and situations where operator skills are limited, is for the fixed film process.</p> <p>The advantages of a submerged fixed film process include:</p>

	<ol style="list-style-type: none">1. a very low sludge production.2. ease of operation.3. Advantages over Activated Sludge.<ol style="list-style-type: none">3.1. attached bio film means no possibility of wash out of bacteria3.2. copes well with variable loads over short and long term – diurnal and seasonal4. low maintenance5. built-in redundancy6. non-specialised, readily-available and inexpensive replacement components7. easy-to-replace components
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Paragraphs 3 – 13 below should be completed for each alternative.

Please note that the alternatives proposed for the WWTP have the same receiving environment and will therefore be assessed together. It is for this reason that Paragraphs 3 – 13 will not be duplicated. Where the alternatives differ, these will be addressed accordingly.

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.

Latitude (S):

Longitude (E):

Alternative:

Alternative S1² (preferred or only site alternative)

24°	3'	29.61"	28°	48'	53.66"

Alternative S2 (if any)

Alternative S3 (if any)

In the case of linear activities:

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

² "Alternative S.." refer to site alternatives.

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

Alternative:

Alternative A1³ (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)

or,

for linear activities:

Size of the activity:

250 Ha
250 Ha

Length of the activity:

Alternative:

Alternative A1 (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)



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

Alternative:

Alternative A1 (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)

Size of the site/servitude:

250 Ha
250 Ha

5. SITE ACCESS

Does ready access to the site exist?

YES	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Access to the site is via the R518.

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;

³ "Alternative A.." refer to activity, process, technology or other alternatives.

- 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.

The Locality Map and Sensitivity Map for the proposed development are attached within **Appendix A**.

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.

Site photographs are attached within **Appendix B**.

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.

Facility Illustrations/ layouts are included within **Appendix C**.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	+/- R66 million
What is the expected yearly income that will be generated by or as a result of the activity?	+/- R455,000.00
Will the activity contribute to service infrastructure?	YES
Is the activity a public amenity?	YES
How many new employment opportunities will be created in the development phase of the activity?	4-6

What is the expected value of the employment opportunities during the development phase?	+/- R3.96m
What percentage of this will accrue to previously disadvantaged individuals?	90%
How many permanent new employment opportunities will be created during the operational phase of the activity?	6
What is the expected current value of the employment opportunities during the first 10 years?	+/- R 1.6m over 10 years
What percentage of this will accrue to previously disadvantaged individuals?	90%

9(b) Need and desirability of the activity

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

NEED:	
i.	Was the relevant municipality involved in the application? NO
ii.	Does the proposed land use fall within the municipal Integrated Development Plan? NO
iii.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation: The proposed development is a small-scale water-borne sanitation sewer upgrade for Ga-Pila Village. The objective of the project is to improve the sanitation infrastructure in Ga-Pila village by replacing all the plastic septic tanks with a more sustainable full water-borne sanitation system.

DESIRABILITY:	
i.	Does the proposed land use / development fit the surrounding area? YES
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
iii.	Will the benefits of the proposed land use / development outweigh the negative impacts of it? YES
iv.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation: Not applicable
v.	Will the proposed land use / development impact on the sense of place? NO
vi.	Will the proposed land use / development set a precedent? NO
vii.	Will any person's rights be affected by the proposed land use / development? NO
viii.	Will the proposed land use / development compromise the "urban edge"? NO
ix.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.

	Not applicable
--	----------------

BENEFITS:	
i.	Will the land use / development have any benefits for society in general? YES
ii.	<p>Explain:</p> <p>Currently there are approximately 1020 households in the growing Ga-Pila community, of which about 750 of these had the Solids Free System installed during the resettlement phase. The installed sanitation system consisted of a flushing toilet in each house, linked to a septic tank for each household and connected to a network collection system through which the settled effluent flowed to sewage ponds, situated close to the village. The septic tanks are periodically desludged. The system is no longer functioning well.</p>
iii.	Will the land use / development have any benefits for the local communities where it will be located? YES
iv.	<p>Explain:</p> <p>Employment opportunities will be presented (temporary during the construction phase, but would allow for skills development; and permanent during operation, however a very limited number). Furthermore, local supplies will be used for construction. Thus, the activity will boost the local economy.</p>

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.

Table 5: Applicable Legislation, Policies and/ or Guidelines

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
National Environmental Management Act (Act No. 107 of 1998)	<p>NEMA requires, inter alia, that:</p> <ul style="list-style-type: none"> ○ Development must be socially, environmentally, and economically sustainable. ○ Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied. ○ A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions. <p>EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p>	National Department of Environment, Forestry and Fisheries (DEFF) Limpopo Department of Economic Development, Environment and Tourism (LEDET)	The Basic Assessment is undertaken in accordance with the requirements of Government Notice R326 of April 2017, as required in terms of the National Environmental Management Act, 1998 (No. 107 of 1998).
National Environmental Management Act (Act No. 107 of 1998)	<p>A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts.</p> <p>In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution</p>	National Department of Environment, Forestry and Fisheries (DEFF) Limpopo Department	<p>While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the EIA Phase.</p> <p>The implementation of mitigation measures is included as part of the Project EMPr and will continue to apply throughout the</p>

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	or degradation of the environment associated with a project is avoided, stopped or minimised.	of Economic Development, Environment and Tourism (LEDET)	life cycle of the project.
National Water Act (Act No. 36 of 1998)	<p>The Minister may require any person to provide information to the Department as prescribed in the regulations. The general public and water users must have access to information in the national systems (NWA, 1998).</p> <p>Approval must first be required from municipalities to use water from a source other than the proposed water service provider in terms of the Water Services Act. External guidelines are developed for an application process by the Department of Water and Sanitation (DWS) for generic water use authorization.</p> <p>Water uses need to be authorized if they are not allowed in terms of Schedule 1 of the NWA under a tiered authorization system as a General Authorization (GA) as published under Section 39 of the NWA or as a WUL, as provided for in terms of Section 21 of the NWA. Section 21 of the NWA recognizes different forms of water uses including non-consumptive water uses (such as the disposal of waste in a manner which may detrimentally impact the altering of watercourses or a water resource) and consumptive (such as the storing and taking of water) and are subject to a Water Use License Application (WULA) process, excluding:</p> <ul style="list-style-type: none"> an Existing Lawful Use. under General Authorization as elucidated above; and water use under Schedule 1. <p>The NWA outlines 11 consumptive and non-consumptive water</p>	Department of Human Settlements, Water and Sanitation (DWS)	Treated wastewater limit values applicable "In terms of the General Authorisation for Section 21(f) Discharging waste or water containing waste into a water resource of less than 2 000 m3/day into an unlisted resource, treatment of wastewater is required to General Limits"

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	uses under section 21.		
National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004)	This Act provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998; the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.	Limpopo Department of Economic Development, Environment and Tourism (LEDET)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project in proper management on site.
National Environmental Management: Waste Act (Act No. 59 of 2008)	The NEMA: WA came into effect on the on 1 st July 2009. Section 20 of the Environment Conservation Act 73 of 1989, under which waste management was previously governed, was repealed. In general, the act seeks to ensure that people are aware of the impact of waste on their health wellbeing and the environment, and in the process giving effect to Section 24 of the constitution, in ensuring an environment that is not harmful to health and wellbeing.	National Department of Environment, Forestry and Fisheries (DEFF) National Department of Environment, Forestry and Fisheries (DEFF) – lead authority for regulating hazardous waste. Provincial Environmental Department – for regulating general waste.	No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act, as detailed in the applicable EMP, as well as in accordance with the relevant Norms and Standards.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas". The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.	Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Reporting in terms of compliance to GNR831 will be required. While no permitting or licensing requirements arise from this legislation for the site, this Act will find application during the construction phase of the project. The implementation of dust mitigation measures are included

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	Dust Control Regulation Control Regulations, R. No. 827 of 1 November 2013.		as part of the project EMPr and will continue to apply throughout the life cycle of the project. Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.
National Heritage Resource Act, 1999 (Act No. 25 of 1999)	Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including the construction of a road, exceeding 300m in length. In accordance with the NHRA, an independent heritage consultant is to conduct a cultural heritage assessment to determine any impact on any sites, features or objects of cultural heritage significance. If none are identified, any archaeological sites or graves to be exposed during construction work must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. If a permit is required as per section 34 of the NHRA, no works are to commence before the permit is obtained.	South African Heritage Resources Association (SAHRA) Limpopo Heritage Resources Authority (LIHRA)	Should any heritage sites be unearthed during excavations, a permit would be required to be obtained from SAHRA.
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	Limpopo Department of Economic Development, Environment and Tourism (LEDET)	No permitting is required. The act finds applicability during the public participation process phase of the Basic Assessment process.
Occupational Health and Safety, 1993 (Act No. 85 of 1993)	The Occupational Health and Safety Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.	Department of Labour (DoL)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Health and safety precautions measures must be put in place for the construction crew and the general public. E.g. Protection of workers on site through provision of Personal Protective Equipment's; Training and other health and safety amenities.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
			The EMPr provides for measures to ensure that objectives of the Act are met on this site.
Hazardous Substances Act, 1973 (Act No. 15 of 1973)	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <ul style="list-style-type: none"> » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance; » Group IV: any electronic product; » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force. 	Department of Health (DoH)	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.

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	
Could not be determined at this stage	

If yes, what estimated quantity will be produced per month?

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

Construction rubble/ solid waste will be temporarily stored on site in designated waste skips and then removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr – **Appendix F**.

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

General waste removed from site will be disposed of at a suitably licensed disposal facility. The nearest licensed landfill site shall be utilised. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase.

Will the activity produce solid waste during its operational phase?

	NO
--	----

If yes, what estimated quantity will be produced per month?

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

As the proposed development falls under the Bela-Bela Local Municipality, the council will collect the waste on a regular basis and dispose of at a registered landfill.

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

As above.

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?

	NO
--	----

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?

	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

If no, describe the noise in terms of type and level:

During the construction phase, increase in noise pollution due to, among others, excavations and site clearing, noise from construction vehicles and construction staff and or drilling activities. Noise pollution caused during construction could potentially be a nuisance to neighbouring areas.

During the operational phase, there is likely to be an increase in noise as a result of an increase of people accessing the diesel depot. A possible source of noise includes trucks buying diesel and idling for a long time.

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
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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:

Does the activity require a water use permit from the Department of Water Affairs?

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.

13. ENERGY EFFICIENCY

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

- Heat pumps
- Harvesting of rainwater

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

Not Applicable for the nature of this development.

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

)
A):

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

Please note: the same would apply for both alternatives proposed thus will therefore be addressed together. It is for this reason that Paragraphs 1 – 6 will not be duplicated. Where the alternatives differ, these will be addressed accordingly.

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

YES	
-----	--

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:

<ul style="list-style-type: none"> • Portion 17 of the Farm Sterkwater 229 KR • ERF 1002 GA-PILA • ERF 813 GA-PILA

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

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:

Rural settlements

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?

	NO
--	----
- Must a building plan be submitted to the local authority?

	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:

The project site is situated at an elevation of about 1123m and slopes slightly southward.

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
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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
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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	
2.3 Side slope of hill/mountain		2.8 Dune	
2.4 Closed valley		2.9 Seafont	
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)	NO	YES NO	YES NO
Dolomite, sinkhole or doline areas	NO	YES NO	YES NO
Seasonally wet soils (often close to water bodies)	YES	YES NO	YES NO
Unstable rocky slopes or steep slopes with loose soil	NO	YES NO	YES NO
Dispersive soils (soils that dissolve in water)	NO	YES NO	YES NO
Soils with high clay content (clay fraction more than 40%)	NO	YES NO	YES NO
Any other unstable soil or geological feature	NO	YES NO	YES NO
An area sensitive to erosion	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).

Hydrology

As per the Sensitivity Report attached as **Appendix D1**, the study site and surroundings are classified as Low Aquatic Biodiversity sensitivity and not located within a Strategic Water Source Area (SWSA). This is depicted in **Figure 5** below.

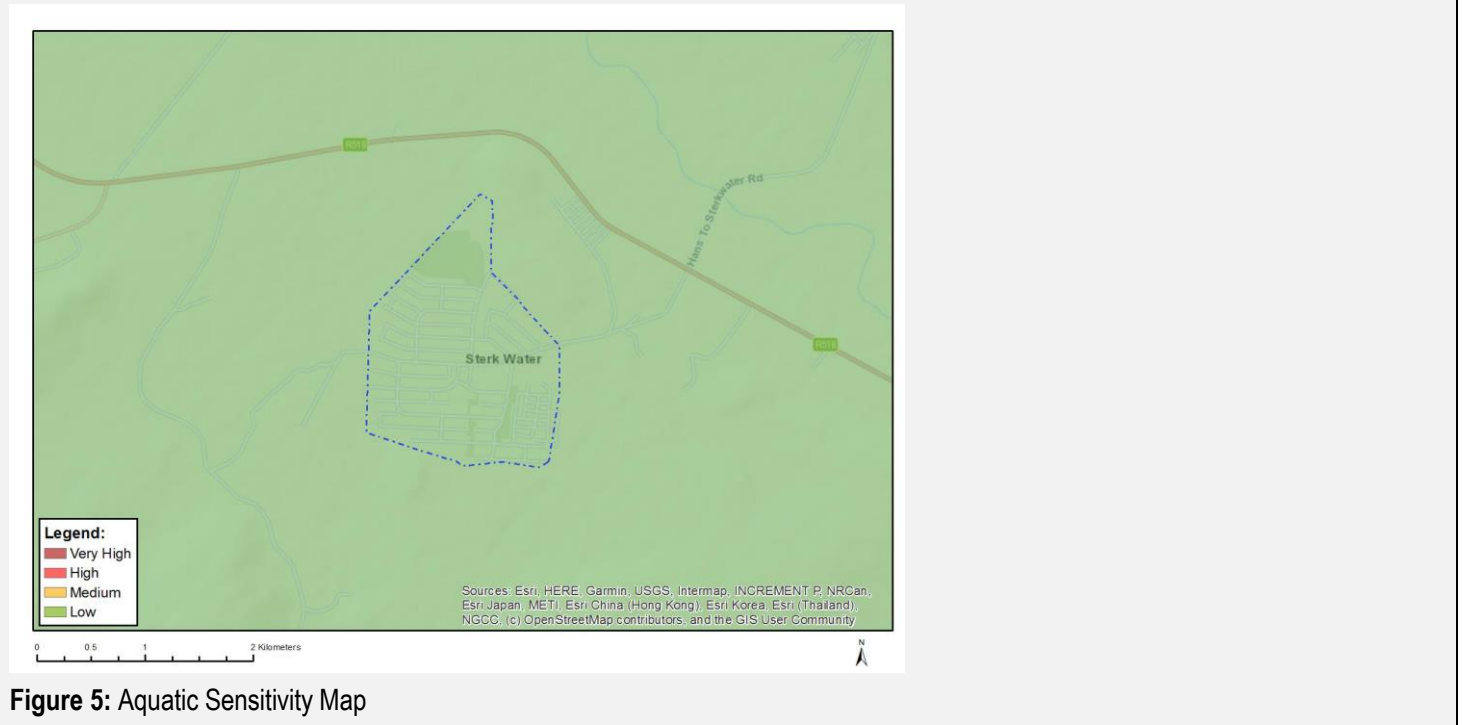


Figure 5: Aquatic Sensitivity Map

The site is situated in Quaternary Catchment A61G. In this catchment, the precipitation rate is considerably lower than the evaporation rate with a Mean Annual Precipitation (MAP) to Potential Evapotranspiration (PET) of 0.25. Consequently, wetlands in this area are sensitive to changes in regional hydrology, particularly where their catchment becomes transformed and the water available to sustain them becomes redirected. Quaternary Catchment A61G falls in the first Water Management Area (WMA); Limpopo WMA. In this WMA, the major rivers include the Limpopo, Matlabas, Mokolo, Lephalele, Mogalakwena, Sand, Nzhelele, Mutale and Luvuvhu rivers.

The Ga-Pila Village slopes northwards. Several non-perennial streams are located in or adjacent to the town (see **Figure 6**). Two non-perennial drainage lines, flowing northwards through Ga-Pila Village, will be impacted on by the proposed pipeline routes. Another two drainage lines are situated directly west and east of Ga-Pila. The streams drain north into the Mogalakwena River which ultimately flows into the Limpopo River approximately 200 km north of the study site.

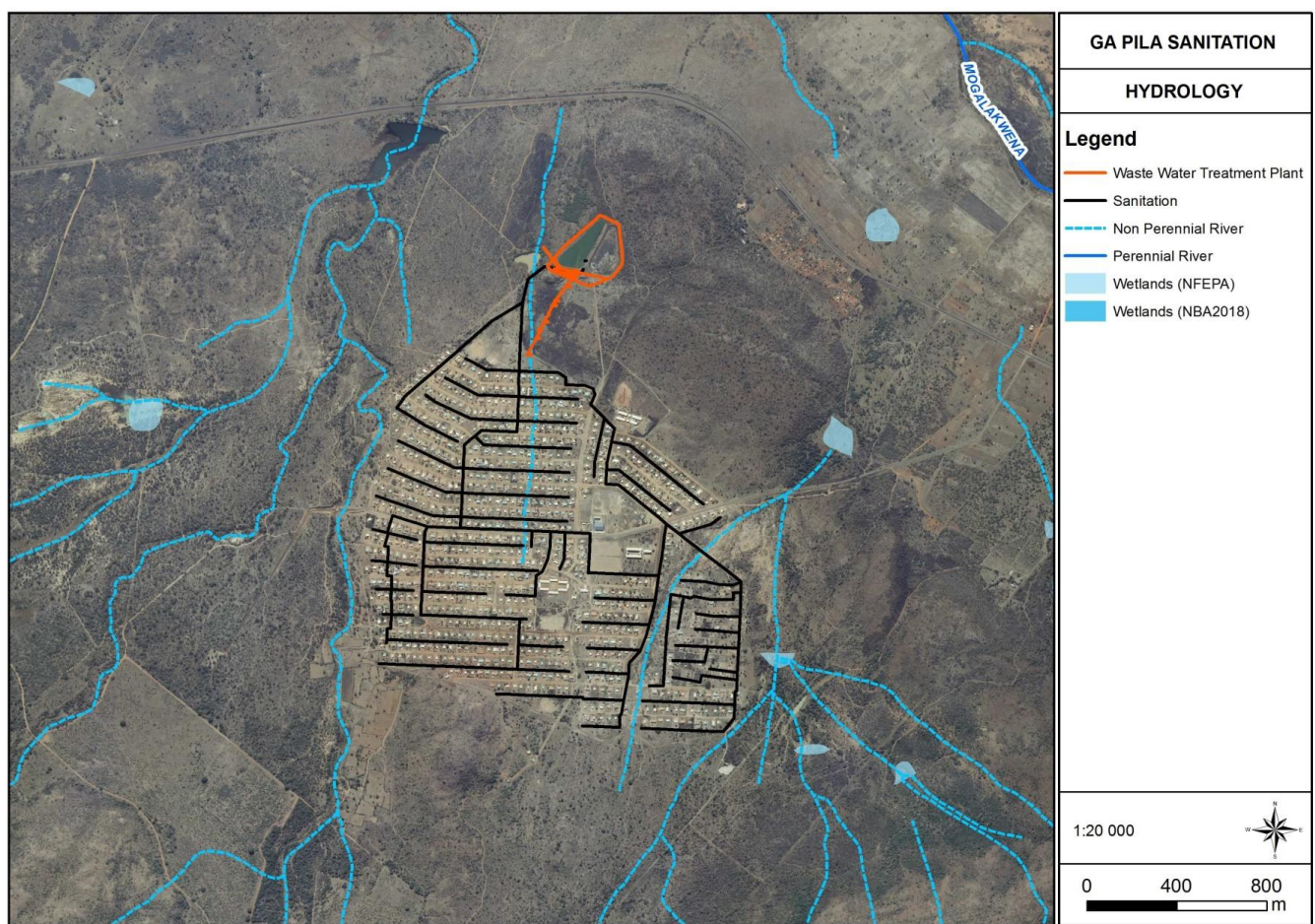


Figure 6: Regional hydrology

Watercourse Classification and Delineation

Three watercourses were identified within and on the outskirts of the study site. These watercourses are all classified as non-perennial. The western watercourse is classified as a Non-Perennial Ephemeral River, and the streams in the middle and east are classified as Non-Perennial Episodic Streams. All the watercourses flow in a northern direction toward the Mogalakwena River

although some are interrupted by residential housing and/or agricultural lands.

A buffer zone of 51m was calculated for the Ephemeral River and 81m for the two Episodic Streams, following Macfarlane *et al.*, (2015), based on site specific characteristics and the expected risks associated with the proposed sanitation infrastructure upgrade. This buffer zone is relevant to authorisation from the DWS, although it is not likely that the infrastructure footprint will remain outside of these suggested buffer zones. Figure 7 presents the delineated watercourses together with their associated buffer zones.

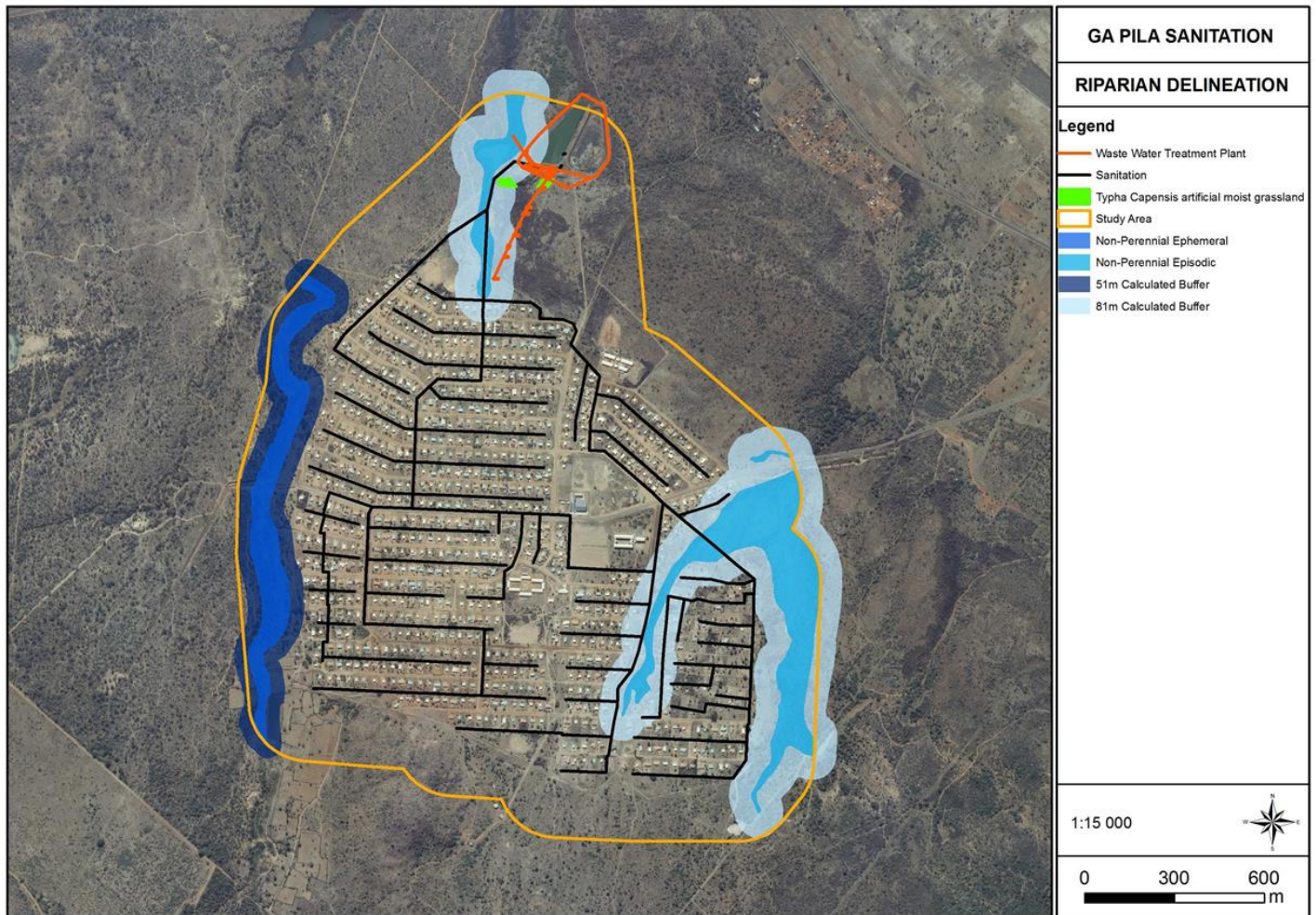


Figure 7: The delineated riparian areas associated with the study site and surroundings.

Geology:

From the available literature as well as observations during the site investigation, it is evident that Ga- Pila village is underlain by Nebo - Granite belonging to the Lebowa Granite Suite of the Bushveld Igneous Complex. Typically, these igneous rocks are crosscut by dolerite/ diabase dykes of various ages.

The area is blanketed by a thick transported material comprising a dark brown, medium dense to dense, clayey silty sand with scattered gravel. However, it was evident that the wastewater treatment package plant is underlain by ferrogabbro belonging to the upper zone of the Rustenburg Layered Suite within the Bushveld Igneous Complex.

As a result of deep and extensive chemical weathering, the rockmass has been reduced to residual clayey silts. From experience it is known that the depth of weathering in these norite/gabbro can be variable, with the possibility of corestone remnants.

The wastewater treatment plant is blanketed by “black turf” and fill.

Much debate in the academic field of engineering geology has yet to finalise the origin of the colloquially named “black turf” or “black cotton soils”. This material typically occurs as a blanketing layer over the residual soils derived from the weathering of the bedrock rocks comprising the Bushveld Igneous Complex (BIC).

The area is known for its rich minerals and the geology consists of gneisses and migmatites (Hout River Gneiss) with some intrusions of potassium-deficient gneisses (Goudplaats Gneiss) and sand and mudstones of the Matlabas Subgroup. In general, the soils are deep greyish sands, eutrophic plinthic catenas, red, yellow apedal freely drained soils with a high base status and clayey soils in low-lying areas. The climate associated with the vegetation unit is summer rainfall with very dry winters, a mean annual precipitation of about 350-550 mm.

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.

Agriculture

According to the Screening Report, with regards to Agriculture in the development area, the sensitivity is considered Medium-High. This is depicted in **Figure 8** below. The area surrounding the study site and surroundings has been utilised for agriculture, especially adjacent to the Mogalakwena River, from as early as 1963 and rapidly expanded to include the area where the town of Ga Pila was to be established. The footprint of the town was thus impacted from around 1972 and impacts increased in the 1990s when the town was established. The small episodic streams that are found east of the town were therefore impacted by prolonged agriculture and later through urbanisation and have become eroded (**Figure 9**). The non-perennial river west of the study has remained relatively unchanged.

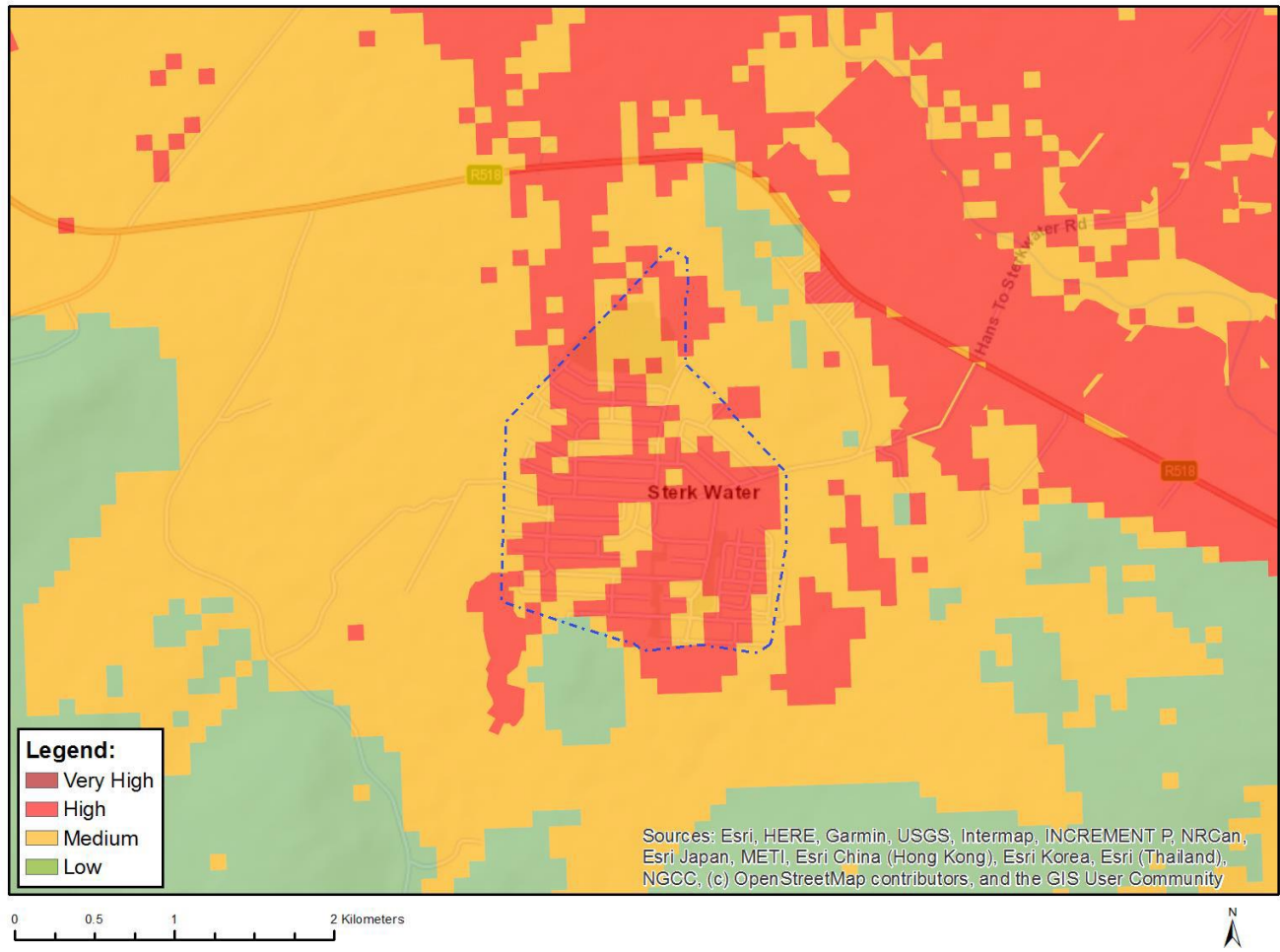


Figure 8: Agriculture Sensitivity Map

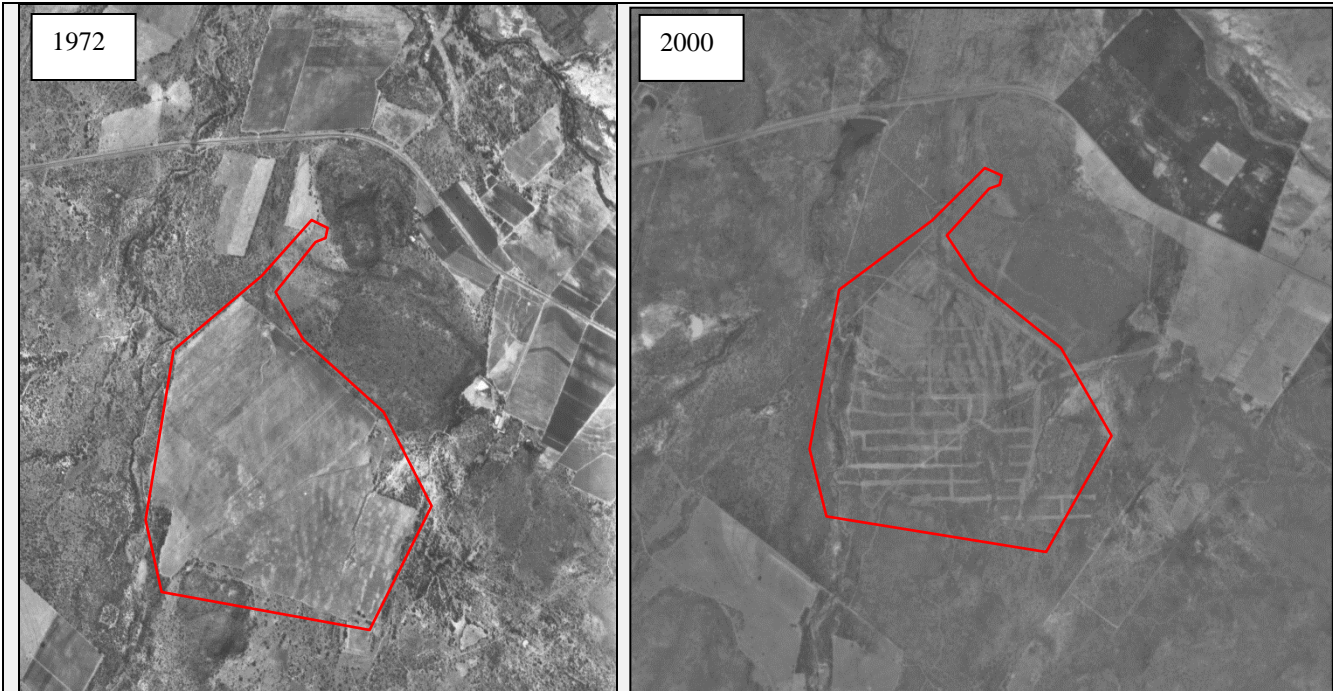


Figure 9: Historical aerial image of the site in the year 1972 (left) and 2000 (right) (Chief Directorate National Geospatial Information Geospatial Portal). The PAOI is estimated in red

Terrestrial Vegetation

Regional Vegetation: The study site is situated within the Savanna Biome of South Africa and in specific, the Mukhado Sweet Bushveld. This bushveld comprises short shrubby bushveld, dominated by *Vachellia* and *Senegalia* trees, with a poorly developed grass layer. This vegetation type is poorly protected and Vulnerable to extinction.

The Central Sandy Bushveld occurs to the west of the site, and its likely the site includes elements of this vegetation type. The Sandy Bushveld vegetation comprises tall, deciduous *Terminalia sericea* (silver cluster-leaf) and *Burkea africana* (wild seringa) woodland on deep sandy soils and low, broad-leaved *Combretum* woodland on shallow rocky or gravelly soils. Species of *Vachellia*, *Senegalia*, *Ziziphus* and *Euclea* are found on flats and lower slopes on eutrophic sands and some less sandy soils. *Vachellia tortilis* may dominate some areas along valleys. Less than 3% of this vegetation type is statutorily conserved, while about 24% is transformed by cultivation and urban and built-up areas, as well as rural communities. This vegetation type is regarded as Vulnerable.

Threatened ecosystem: According to the 2011 Listed Ecosystems, the site is not situated within a Listed Ecosystems published in terms of the Biodiversity Act in 2011. Also, the recent National Biodiversity Assessment (NBA) 2018 represents an update of the assessment of threat status for terrestrial ecosystems and classified the ecosystems that the site is situated in as Least Concern.

Ecological processes and drivers in the bushveld: Summer rainfall coupled with winter fire and regular grazing ensures that the grass layer remains dominant in the bushveld. In addition, the lack of sufficient rainfall prevents the upper layer (trees) from dominating.

However, where disturbances and development are present, the tree layer could become increasingly dominant. Also, increased moisture, as well as soil disturbances will result in a denaturation of the tree layer.

Limpopo Biodiversity Assessment and Conservation Plan (Figure 10): The site falls within an Ecological Support Area 2 (ESA), which is embedded within and ESA 1. ESAs play an important role in supporting the ecological functioning of a protected area or Critical Biodiversity Area, in delivering ecosystem services. In most cases ESA2 sites are those with degradation, whereas ESA1 are near-natural to natural.

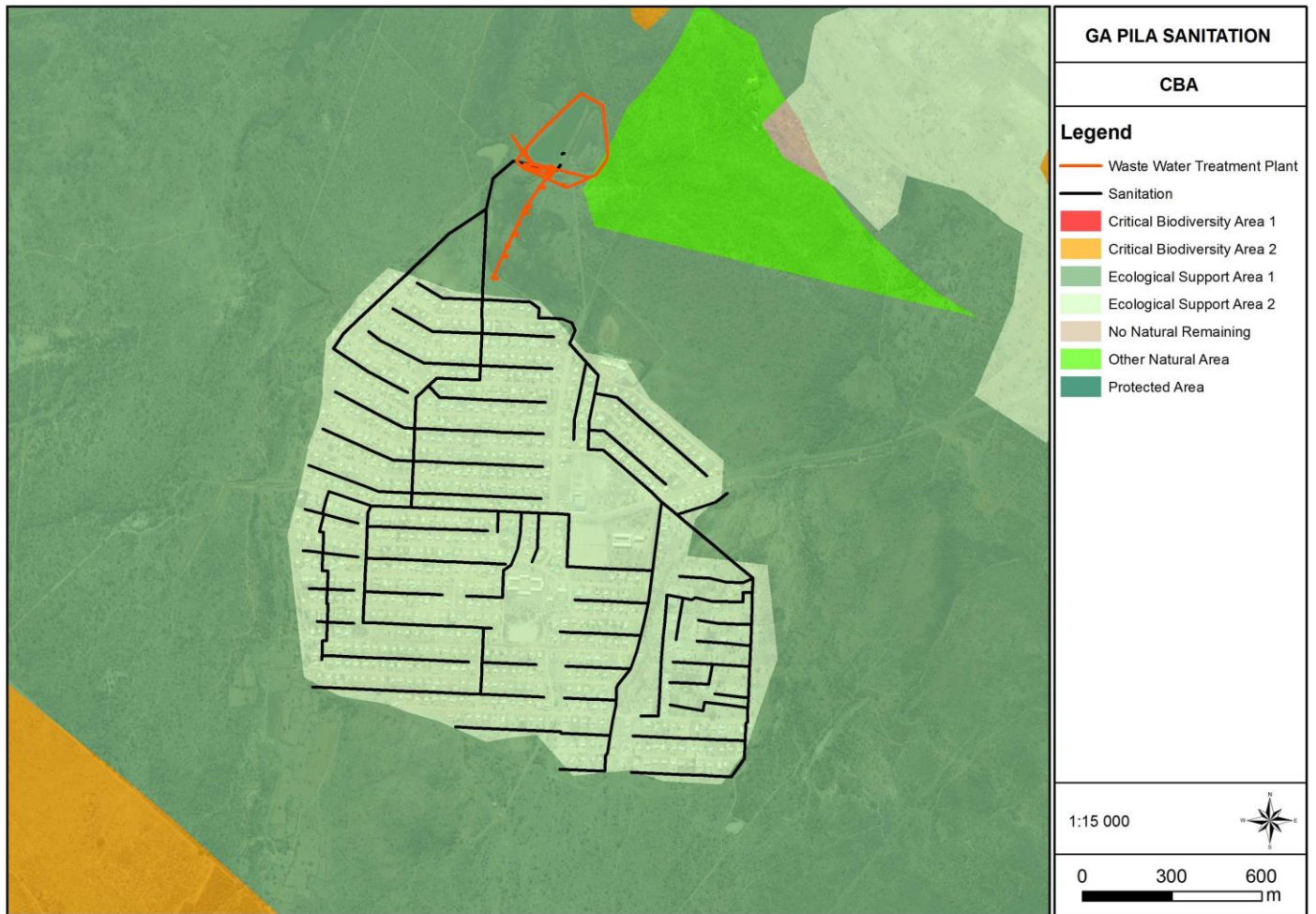


Figure 10: Limpopo Biodiversity Assessment and Conservation Plan

Vegetation within the Project Area of Influence (PAOI)

Much of the proposed project will traverse modified land where little to no natural vegetation remains. Natural vegetation remains to the north, east, south, and west of the project area, however, limited natural and good condition vegetation is present in the primary and secondary PAOI which is discussed under this heading. Most of the northern extent of the project falls within black clay soils and was dominated by *Vachellia* and *Senegalia* tree species (thorn trees). Sandier soils are present towards the south, where trees such as *Combretum* species and *Terminalia sericea* become more prominent. Some natural vegetation remains along drainage lines, although

the vegetation was degraded. Based on the dominant species, soil, land use historical disturbances, the vegetation within the primary and secondary area of influence was grouped as follows:

1. Built-up and modified
2. Vegetation within the existing sewerage treatment area
3. Degraded and modified bushveld
4. Secondary bushveld
5. Vegetation along drainage lines
 - 5.1 *Spirostachys africana* tree dominated vegetation
 - 5.2 *Typha capensis* moist grassland
 - 5.3 *Sporobulus africanus* moist grassland

The vegetation groups are shortly discussed below and geographically represented in **Figure 11**. Species recorded in each vegetation group is listed in **Appendix D2**.

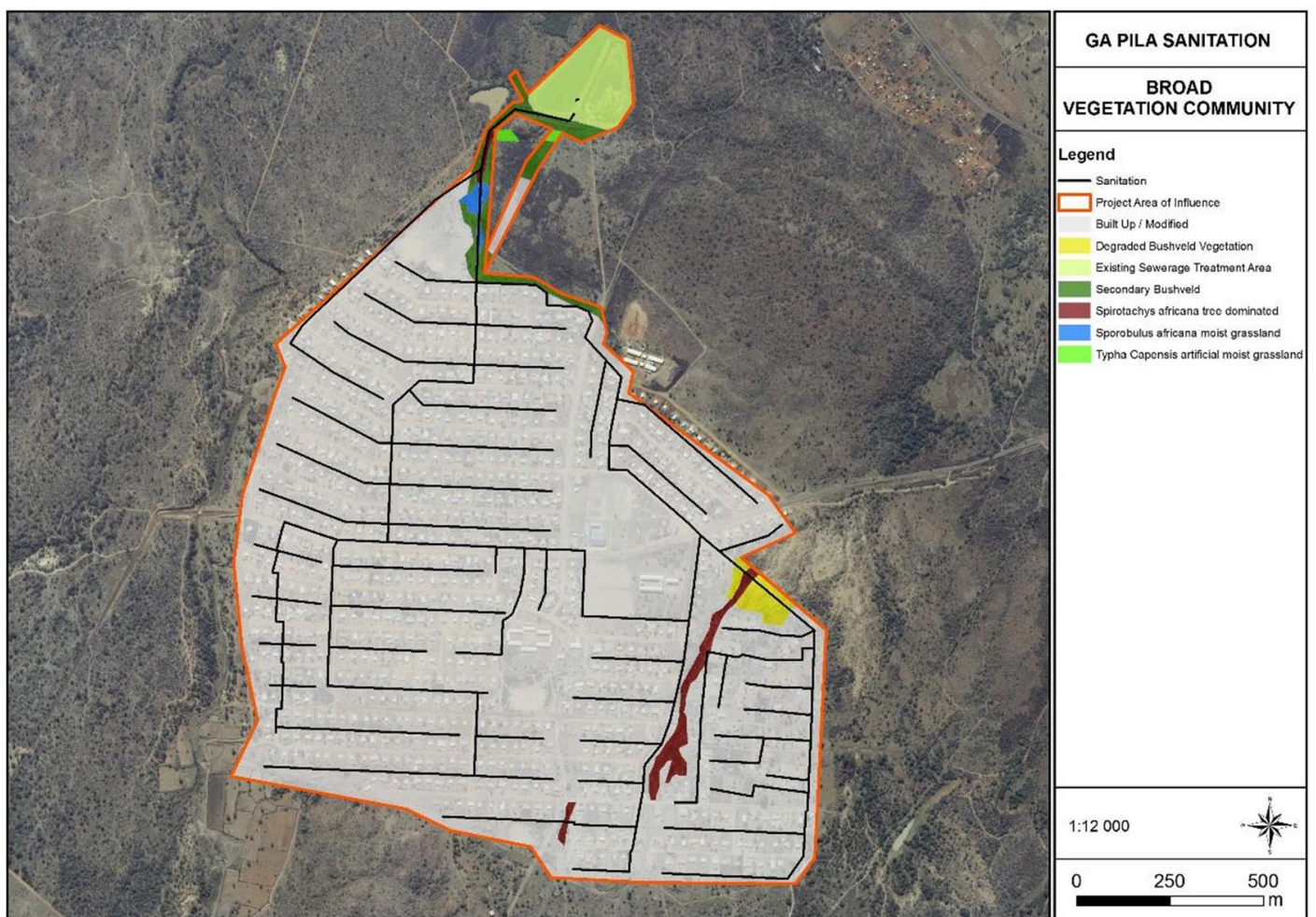


Figure 11: Vegetation map for the area surveyed

Plant species of conservation concern: A list of plants of conservation concern was compiled using information from the South African National Biodiversity Institute's (SANBI) Botanical Database of Southern Africa (BODATSA) (SANBI, 2016), Raimondo et al, (2009) and information from the Citizen Science website, iNaturalist. The area that the proposed site is situated in is not known for threatened, endemic or protected plant species. Only one (1) plant species of conservation concern that might be present in the area were shortlisted and are discussed in **Appendix D2**. This species is more likely to be present in the rocky hills surrounding Ga Pila Village. Also, the national screening tool report, list this site as being of low plant species sensitivity, indicating that no plant species of conservation concern were previously recorded or are expected to be present on or immediately around the site.

NEMBA Threatened or Protected Plant Species (TOPS): Certain activities, known as 'Restricted Activities', are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the act are keeping, moving, having in possession, importing, and exporting, and selling. The first list of threatened and protected species published under NEMBA was published in the government gazette on the 23rd of February 2007 along with the Regulations on Threatened or Protected Species. The plant *Harpagophytum procumbens* (devil's claw) could be present in the project area. This species is listed as a protected medicinal plant. This plant was not recorded at the time of this site verification and no other TOP species are expected to be present on the site or immediate surrounds.

Provincially Protected Plants: Several plants are provincially protected by the Limpopo Environmental Management Act 2003 (Act 7 of 2003). These plants are not to be removed, damaged, or destroyed without a permit from the Limpopo Department of Economic Development Environment and Tourism.

One tree species, *Spirostachys africana* (tamboti) was recorded along the drainage lines. Some trees were harvested, likely for furniture or fence posts, as it is poisonous as firewood. In addition, a succulent, believed to be an *Orbea* species or a *Duvhlaia* species, was also recorded.

If these plants are pruned, damaged, or removed for the project, a permit to do so must be obtained from the Limpopo Department of Economic Development Environment and Tourism. Figure 10 includes localities of these species within walked transects, however, more individuals are likely present.

National Protected Trees: The National Forest Act, 1998 (Act No. 84 of 1998) enforces the protection of several indigenous trees. The removal, thinning or relocation of protected trees will require a permit from the Department of Agriculture, Land Reform and Rural Development (DALRD, formerly Agriculture, Forestry and Fisheries) ((Notice of the List of Protected Tree Species under the National Forests Act, 1998 (ACT NO 84 OF 1998), Notice 536 of 2018, Government Gazette, 7 September 2018).

The following table lists the protected trees that were recorded within the project area, as well as an additional species which also likely occurs, but was not recorded at the time. the locality of these species within walked transects are depicted in Figure 12. Note that these are the minimum localities and other individuals are likely present.

Table 6: National protected trees recorded and likely to occur

Species name	Common name
<i>Sclerocarya birrea</i> subsp <i>caffra</i>	Morula
<i>Combretum imberbe</i>	Leadwood
Highly likely to occur in the area	
<i>Boscia albitrunca</i>	Shepherds' tree

Vegetation Sensitivity

The vegetation sensitivity is geographically represented in **Figure 12**, which also includes the localities of protected plant and tree species recorded at the time of this assessment. The sensitivity of the vegetation is discussed below and are not considered a fatal flow to the proposed Sewer Upgrade.

Areas of low sensitivity: Modified and built-up areas were irreversibly modified from the reference state of Mukhado Sweet Bushveld, while the degraded bushveld has lost most of its vegetation structure and species composition. These areas were considered as being of low sensitivity to the proposed development. However, protected tree species may be present within the pipeline footprints and should be avoided or a permit for their removal / pruning should be applied for. Most types of development can proceed within these areas with little to no impact on conservation worthy vegetation. Edge effects to other proximate sensitivity classes must be mitigated / prevented.

Areas of medium sensitivity: The secondary bushveld vegetation, as well as the vegetation associated with the drainage lines, comprised semi-natural to moderately modified vegetation. This vegetation maintains ecological function even though the composition and structure have been compromised. Provincially protected plants, as well as national protected trees were recorded in both these vegetation groups. High impact developments should be considered with caution, if at all. Medium to low impact development, including linear infrastructure can continue. Development must be restricted in footprint and impacts managed and mitigated by an approved management plan. Edge effects to higher sensitivity classes in its proximity must be mitigated / prevented

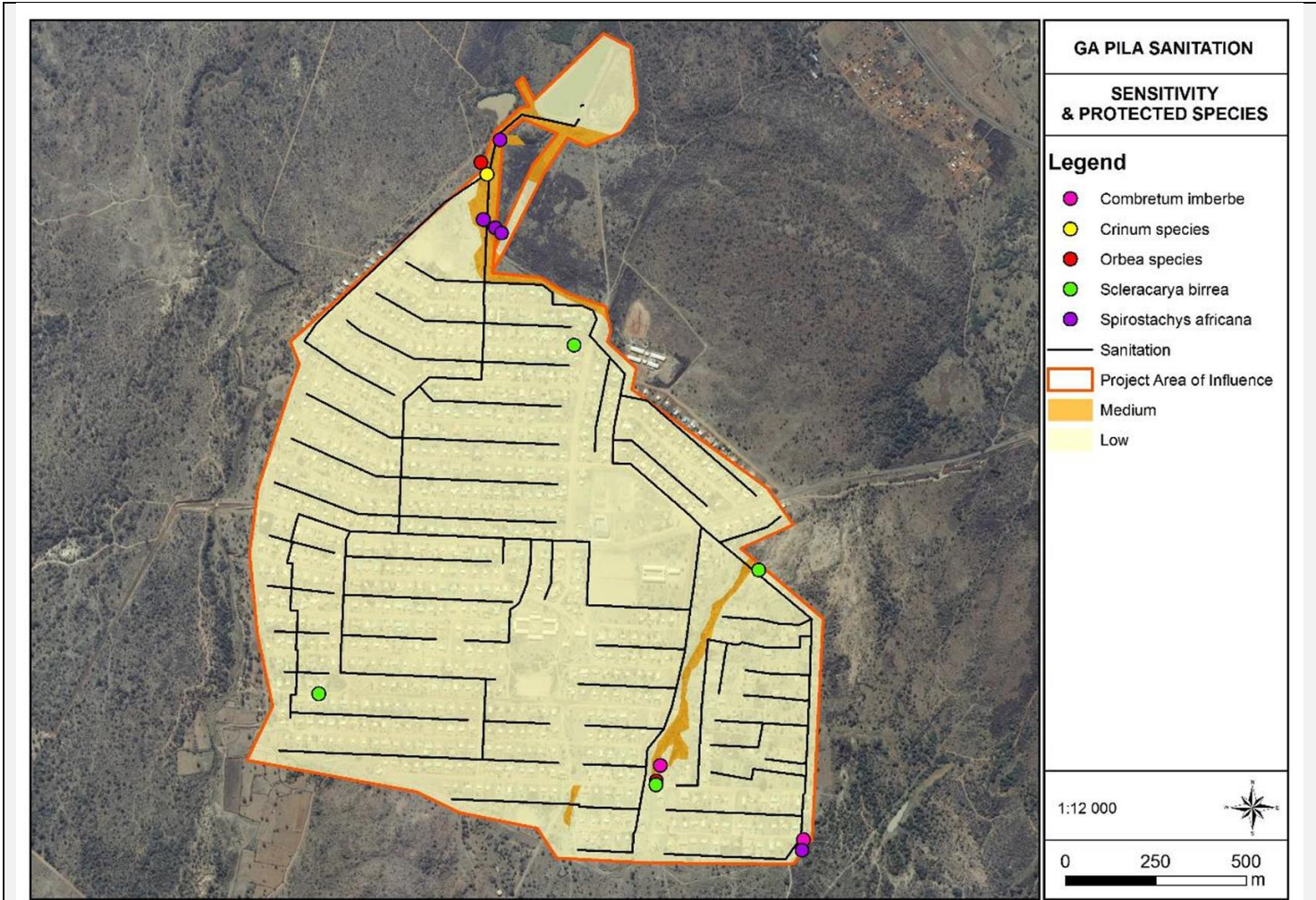


Figure 12: Sensitivity of the vegetation to the proposed sewer upgrade

Fauna

According to the Screening Report, with regards to Animal Species in the development area, the sensitivity is considered medium as is depicted in **Figure 13** below.



Figure 13: Animal Species Sensitivity Map

The following is relevant in terms of species of conservation concern:

- No SCCs are expected to occur on site or utilise the site to an extent that would cause impact to the SCCs.
- None of the previously recorded TOP vertebrates are considered as likely to occur on site and are unlikely to be impacted by the proposed development.
- The TOP invertebrate (Baboon Spider) cannot be excluded from site, but as a burrowing species may be deterred from site due to the anthropogenic activity and disturbed nature of the site. The species is more likely to occur in the less disturbed surrounding areas where it will persist, if present, and be minimally impacted by the proposed development as long as activity remains within discrete activity areas.
- Four TOP species (two mammals and two birds) with appropriate distribution over the project area cannot be excluded from site, but the birds and the Honey Badger are very mobile species that can retreat and can escape threat and impact. The South African Hedgehog is a nocturnal species, but is conspicuous with adequate vigilance and awareness and must be actively monitored to prevent inadvertent harm to the species.
- The nearby ponds and dams may support aquatic birds, but the limited extent and mostly ephemeral nature (old sewer pond appears to permanently contain water) of these habitats makes significant populations of congregatory water birds unlikely. The proposed rehabilitation of the old sewer ponds is not considered a significant loss of habitat for congregatory species. Indirect impact through runoff must be mitigated and activities should proceed in a manner to reduce noise-related stress to the surrounding avifauna.
- The site does not support any special endemic species and does not form part of an area of faunal endemism and no impacts are expected on restricted endemic species.

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	X
5.2 Low density residential	X	5.23 Tertiary education facility	
5.3 Medium density residential		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	X
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	
5.17 Plantation	X	5.38 Nature conservation area	
5.18 Agriculture	X	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 "A" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	A Wastewater Treatment Works currently onsite will be upgrade, the plant will service a village of mine workers in Limpopo – 1028 low income households or 'stands. They have used 650mg/L COD as the Domestic Effluent strength the design shown.
If NO, specify:	

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

If YES, specify and explain:	
If NO, specify:	

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:	
------------------------------	--

If NO, specify:

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:

If NO, specify:

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 Archaeological or palaeontological sites, on or close (within 20m) to the site?

NO

If YES, explain:

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:

As per the Screening Report, the Archaeological and Cultural Heritage Sensitivity on the proposed development area is considered medium sensitive as a result of mountains or ridges within the area. This is depicted in **Figure 14** below.

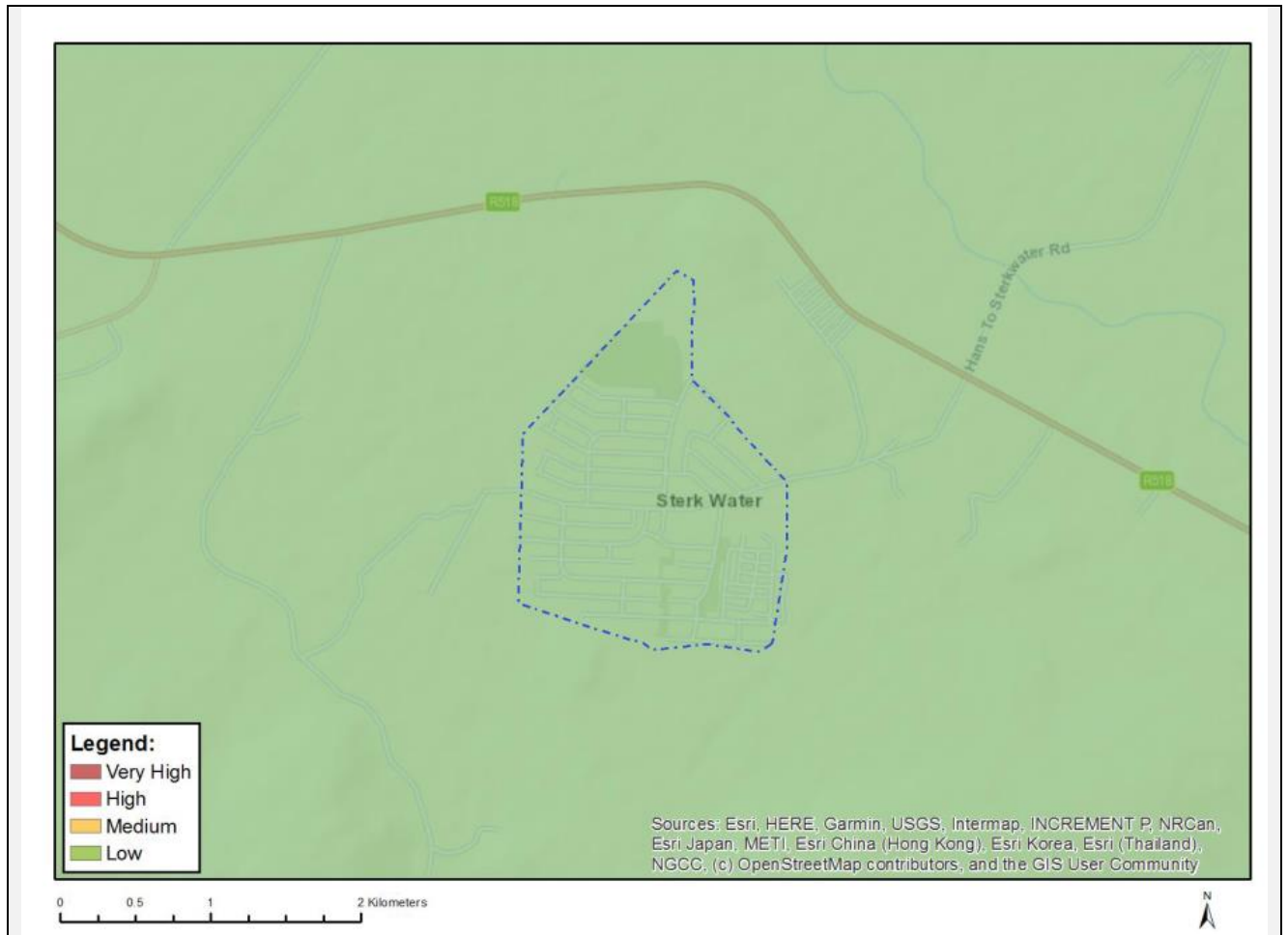


Figure 14: Archaeological and Cultural Heritage Sensitivity

As per the HIA, the cultural landscape qualities of the region are made up of a pre-colonial element consisting of a limited Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component. During the survey no sites, features or objects of cultural significance were identified. This is depicted in Figure 15 below.

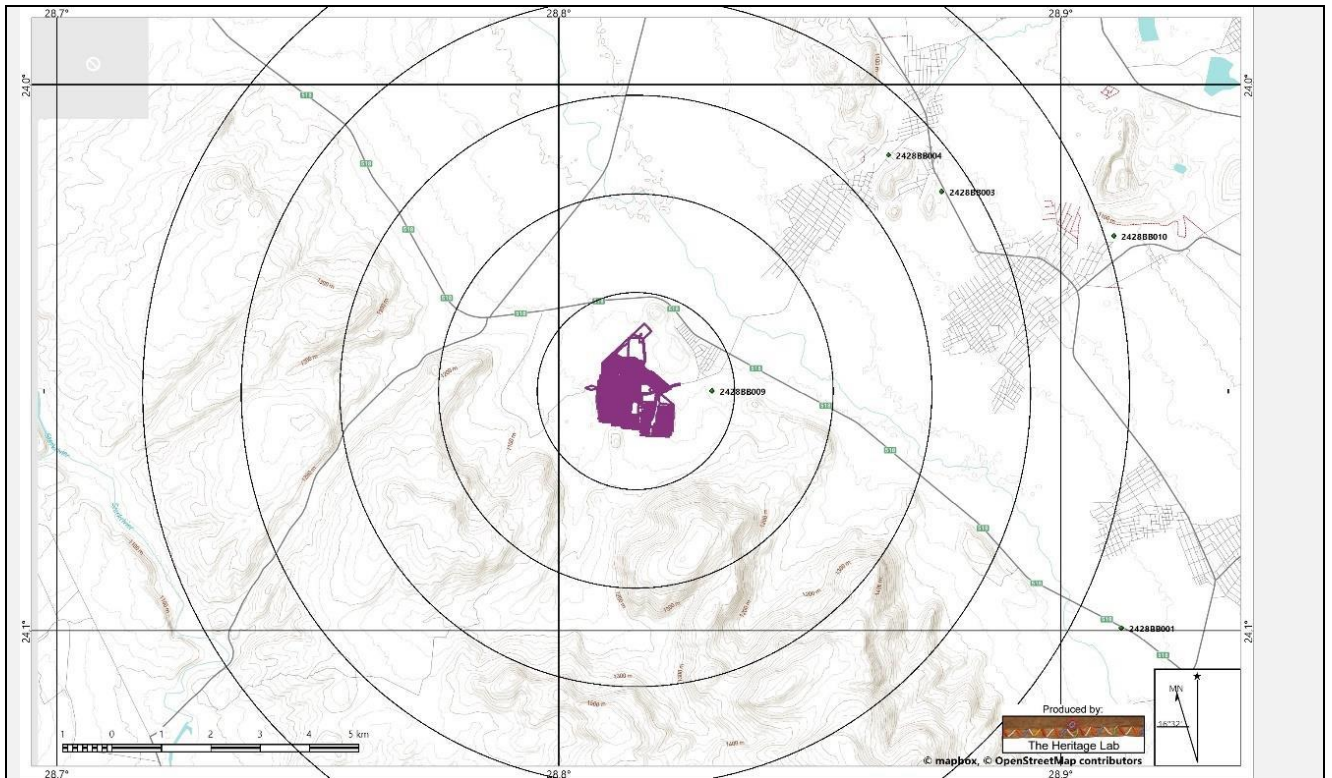


Figure 15: Location of known heritage sites and features in relation to the project area (*Circles spaced at a distance of 2km; heritage sites = coded green dots*)

The **Palaeontological Sensitivity Map** (<http://www.sahra.org.za/sahris/map/palaeo>) indicate that project area (**Figure 16**) mostly has an insignificant to zero sensitivity of fossil remains to be found and therefore no palaeontological studies are required.



Figure 16: Palaeontological Sensitivity Map

Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Refer to **Appendix D4** for the comprehensive Heritage Impact Assessment.

Will any building or structure older than 60 years be affected in any way?

	NO
	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

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

According to EIA Regulations of 2014, minimum public participation requirements are as follows:

1. ADVERTISEMENT

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)
Organisation	I&APs type	Designation	First Name Last Name	
Department of Environment, Forestry and Fisheries	National Authority	Forestry	Mulalo Sundani	

Department of Water and Sanitation	National Authority		Lillian Siwelane	
Department of Water and Sanitation	National Authority		M.M Komape	
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Provincial Authority	Acting HOD	Mr Mathodzi Rathumbu (PA: Ms Tryphina Mokgokong)	
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Provincial Authority	Deputy Directors General: (Environment and Tourism)	Ms Keleabetswe Tlouane	
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Provincial Authority	Admin	Mafu Nkosi	
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Provincial Authority	Environmental Impact Management Admin Officer/ Data Capture	S.M Mamabolo	
Limpopo Regional Office - Department of Water and Sanitation:	Provincial Authority	Catchment Officer	M. Nethengwe	
Limpopo Department of Health	Provincial Authority	HOD Health	Dr N.P Kgaphole (PA: Ms Zodwa Rikhotso)	
Limpopo Department of Transport and Community Safety		HOD Community Safety	PA: Ms Laura Mabasa	
Limpopo Department of Transport and Community Safety		HOD Transport	Ms Jane Mulaudzi (PA: Ms Gift Mathale)	
Limpopo Department of Public Works, Roads and Infrastructure		HOD Public Works, Roads and Infrastructure	PA: Ms Nakisane Mthimkhulu	
Limpopo Department of Social Development		HOD Social Development	Mr Desmond Mahopo (PA: Ms Nelbonia Legodi)	
Waterberg District Municipality	Local Authority			
Waterberg District Municipality	Local Authority	Municipal Manager (Acting)	Mabora Mampa	
Waterberg District Municipality	Local Authority	PA of Municipal Manager	Elizabeth Kelly	
Waterberg District Municipality	Local Authority		Tebogo Tshabalala	
Mogalakwena Local Municipality	Local Authority	Mayor	Cllr Ngoako Thulane Taeatsoala	
Mogalakwena Local Municipality	Local Authority	SPEAKER	Cllr Pheladi Olifant	
Mogalakwena Local Municipality	Local Authority	Municipal Manager (Acting)	Mr H.S.M Ngoepe	
Mogalakwena Local Municipality	Local Authority	Acting Community Services Manager	Refilwe Madisha	

Mogalakwena Local Municipality	Local Authority	Acting Manager Planning & Developmental Services	Malesela Lionel Mashishi	
Mogalakwena Local Municipality	Local Authority	Acting Manager Technical Services	Maseroke Yvonne Ester Molepo	
Mogalakwena Local Municipality	Local Authority	Ward 16	Clr RAMASELA SONTI Ledwaba	
Mogalakwena Local Municipality	Traditional Authority	Ga-Pila Traditional Council (LANDOWNER)	Philipos Pila (headman)/ Mpho Pila (Council member)	
Limpopo Heritage Resources Authority (LIHRA)	Provincial Authority		Donald Lithole	
Limpopo Heritage Resources Authority (LIHRA)	Provincial Authority		Muvu Ndlela	
South African Heritage Resources Agency (SAHRA)	National Authority		Andrew Solomon	

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?

NO

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

The following activities will take place during the public participation process:

- **Identification of Key Stakeholders:**

As required by the EIA Regulations of 2014, relevant local, provincial and national authorities, local forums and representatives as well as surrounding land owners and occupants must be notified of the environmental process, proof of this notification will be included in the Final Basic Assessment Report (FBAR).

Relevant government authorities (organs of state) have been automatically registered as IAPs. In accordance with the EIA Regulations of 2014, all other persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders and included in future communication regarding the project; the advertisement and notifications advise that IAPs register as such. All respondents are then to be placed on the project database. This database is supplemented by IAPs who contacts the project manager to be included on the database. The

database is used throughout the process to inform the stakeholders of the project. The stakeholder database will be updated throughout the process.

- **Stakeholder Database**

All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to **Appendix E7**). While I&APs were encouraged to register their interest in the project from the onset of the process undertaken by Envirolution Consulting, the identification and registration of I&APs has been on-going for the duration of the EIA process.

- **Placement of Site Notices & Newspaper advertisement**

Site notices were displayed in different points within the study area; This is included in **Appendix E1**. Newspaper advertisement were placed in Bosveld Review requesting Interested and Affected Parties (I&APs) to register, and submit their comments. This is included in **Appendix E2**.

- **Written notifications**

Access to all information that could influence interested and affected parties has been initiated by the project announcement, which included the placement of site notices and distribution of Background Information Documents (BID's) in the areas. A Background Information Document was produced and distributed during the initial PPP phase in the form of a i) email distribution to registered I&APs ii) a "knock and drop" exercise during visits to surrounding areas iii) registered mail posted to I&APs with no email contacts and lastly iv) a notification to of the project progress. These are all included in **Appendix E3**.

- **Review of the Draft BA Report**

Stakeholder: The BA Report has been publicly made available to all registered I&AP's from **28 July 2022 to 29 August 2022** at the following locations:

- Mogalakwena Library: 55 Van Riebeeck St., Mokopane, 0601
- Dropbox link sent to registered I&APs via email
- Email copy of the BA report document (without appendices) sent to all registered I&APs via email

Authority: The Draft BA Report was sent to (amongst others):

- Provincial Authorities
- Local & District Municipality
- Ward 16 Cllr

All comments received from the review are included in **Appendix E4**.

- **Summary of Issues Raised by I&AP's**

Issues and concerns raised by I&AP's will be integrated into the Issues and Responses Report.

All comments received from IAPs are included in **Appendix E4** of this report.

- **Public consultation**

In order to provide information regarding the proposed project and the EIA process, a background information document (BID) for the project was compiled at the outset of the process. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities will be provided in order for I&APs to have their issues noted. I&APs will be consulted through the following means:

Public meeting in the study area (open meeting)

- Focus group meetings (pre-arranged and stakeholders invited to attend)
- One-on-one consultation meetings (for example with directly affected or surrounding landowners)
- Telephonic consultation sessions
- Written, faxed or e-mail correspondence

All minute of meetings are included in **Appendix E5** of this report.

- **Comments and Responses Report**

At the end of the announcement phase, all comments/input from stakeholders and I&AP's, will be captured in the Issues and Response Report (IRR) which formed part of the Final BA Report. The Comments and Response Report includes responses from members of the EIA project team and/or the project proponent.

This is included in **Appendix E6**.

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.

Comments are expected during the DBAR review period. These concerns/ issues will be addressed and incorporated into the impact assessment section of the FBAR.

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):

As above.

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.

Impact Assessment Methodology

The impact assessment methodology used to assess the alternatives for this project is as follows:

The purpose of impact assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potential environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

The potential impacts of the proposed development were identified through a site visit, the Environmental Assessment Practitioners experience and expertise in the field and specialist study reports. In the Basic Assessment Report, the potential impacts are broadly identified and outlined. An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to reduce the impacts. In general, it is recognized that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks are taken into account during the pre-construction phase of the development.

In accordance with the requirements from the EIA Regulations 2014 GN 982, Regulation 19 (3) and as set out in Appendix 1, the following impacts of the issues identified through the basic assessment phase were assessed in terms of the following methodology. All impacts are assessed according to the following criteria.

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
 - * The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate with
 - * a score of 1 being site specific,
 - * 2 = local (site + immediate surrounds),
 - * 3 = regional (the impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns) ,
 - * 4 = national and
 - * a score of 5 being international (where the impact has international ramifications that extend beyond the boundaries of South Africa).

- The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4; or;
 - * Permanent - assigned a score of 5.

- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$S = (E + D + M) P$; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance** weightings for each potential impact are as follows:

- **< 30 points: Low** (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30-60 points: Medium** (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **>60 points: High** (i.e. Impact is significant, mitigation is critical to reduce impact or risk. Resulting impact could influence the decision depending on the possible mitigation. An impact which could influence the decision about whether or not to proceed with the project.).

3. IMPACT ASSESSMENT

A summary of anticipated significance of the potential direct, indirect and cumulative impacts that is likely to occur as a result of the CONSTRUCTION and OPERATION PHASE **The potential impacts discussed below are relevant for the both Waste Water Treatment Plant (WWTP) design alternatives as discussed in Section A (2) of this report.**

IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Table 7: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that is likely to occur as a result of the CONSTRUCTION PHASE

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
1. IMPACT ON THE AQUATIC BIODIVERSITY				
<p>Direct Impacts (1a) Impacts to hydrological function at a landscape level</p> <p>Nature: Changes to hydrological function at a landscape level which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes). The extent of the modification in relation to the overall aquatic ecosystem (i.e. at the source, upstream or downstream portion, in the temporary, seasonal, permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.). Changes to base flows (e.g. too little/too much water in terms of characteristics and requirements of system). Fragmentation (e.g. road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and longitudinal).</p> <p>Activity: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction of the pipeline.</p>	Medium	<ul style="list-style-type: none"> • During the detailed design phase the footprint and design of structures should aim to have the least impact on habitat quality and hydrology of the watercourse • A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase • Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP. • High energy stormwater input into the watercourses should be prevented at all cost. 	Medium	Expected to be low. The operational phase will not affect hydrological function on a landscape level, affect flood regimes or dynamic processes if no spills occur.

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Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (1b): Changes in sediment entering and exiting the system</p> <p>Nature: Changes in sediment regimes of the aquatic ecosystem and its sub - catchment by for example sand movement, meandering river mouth /estuary, changing flooding or sedimentation patterns</p> <p>Activity: Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. This could result in the loss of topsoil, sedimentation of the watercourse and increase the turbidity of the water. Possible sources of the impacts include:</p> <ul style="list-style-type: none"> • Earthwork activities during construction • Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soils. • Disturbance of soil surface • Disturbance of slopes through creation of roads and tracks adjacent to the watercourse • Erosion (e.g. gully formation, bank collapse) 	<p>Medium</p>	<ul style="list-style-type: none"> • Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses. • Sediment traps should be installed • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. • During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the adjacent surface vegetation. • Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions. • Excavated materials (from any trenching) should not be contaminated and it should be ensured that the minimum surface area is taken up • Any excavated soil/ stockpiles may not exceed 1 m in height. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later usage as backfill material. 	<p>Medium</p>	<p>Expected to be limited provided that the mitigation measures are implemented effectively and sedimentation is appropriately managed.</p>

SECTION C: PUBLIC PARTICIPATION

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (1c): Introduction and spread of alien vegetation</p> <p>Nature: Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users.</p> <p>Activity: The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users.</p>	Medium	<ul style="list-style-type: none"> Undertake an Alien Plant Control Plan which specifies actions and measurable targets Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. 	Low	Expected to be limited provided that an Alien Plant Control Plan is effectively implemented
<p>Direct Impacts (1d): Loss and disturbance of watercourse habitat and fringe vegetation</p> <p>Nature: Assuming that earthworks will remain confined to road reserves vegetation clearing will likely not destroy wetland habitat.</p> <p>Activity: Loss and disturbance of watercourse habitat and fringe vegetation due to direct development on the watercourse as well as changes in management, fire regime and habitat fragmentation.</p>	Medium	<ul style="list-style-type: none"> Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. Implement an Alien Plant Control Plan. Effectively rehabilitate disturbed areas. 	Medium	Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (1e): Changes in water quality due to input of foreign materials e.g. due to increased sediment load, contamination by chemical and /or organic effluent, and /or eutrophication</p> <p>Nature: Changes in water quality due to input of foreign materials e.g. due to increased sediment load, contamination by chemical and /or organic effluent, and /or eutrophication</p> <p>Activity: Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the watercourses and a reduction in watercourse function.</p>	Medium	<ul style="list-style-type: none"> • Locate the infrastructure outside the calculated buffer zone • Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. • Provision of adequate sanitation facilities located outside of the watercourse area or its associated buffer zone • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc. • After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. • Maintenance of construction vehicles / equipment should not take place within the watercourse • Implement Best Practice with regards to concrete mixing on site and control of waste and pollution • All manholes are to be raised above the 1:100 year floodline • Manholes should be constructed to SANS 1200 specification with maximum spacing of 80 m 	Low	<p>Although it may be controlled and largely prevented, the impact of a single spill will have a significant residual effect on the local watercourse integrity. Residual risks should therefore be considered significant</p>
2. IMPACT ON VEGETATION				
<p>Direct Impacts (2a): Destruction of vegetation of low and medium sensitivity</p> <p>Nature: The development will require the removal of the modified vegetation within and around the residential area of Ga-Pila Village. All removal of vegetation, whether sensitive or not, could have an impact on soil stabilisation and water infiltration.</p> <p>Activity: The sources of this impact could include:</p> <ul style="list-style-type: none"> • Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers; 	Medium	<p>Planning:</p> <ul style="list-style-type: none"> • Construction camps can be placed within road verges, or modified vegetation within the Ga-Pila Village. However, these areas must be rehabilitated to the current status quo, including indigenous lawns and trees. • Plan to remove as little indigenous trees as possible, if any. • Plan to remove grass sods from the development footprint in the mowed grassland. These sods must be replanted as part of rehabilitation. • Adhere to buffer zones as set out by the wetland assessment 	Low	<p>Localised alteration of soil surface characteristics and loss of flora.</p>

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<ul style="list-style-type: none"> Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction. 		<p>report.</p> <p>Construction:</p> <ul style="list-style-type: none"> An independent Ecological Control Officer (ECO) should be appointed to oversee construction. A temporary fence or demarcation must be erected around the construction area to prevent access to adjacent vegetation Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. No open fires are permitted within naturally vegetated areas or open spaces. Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas. Only remove vegetation where necessary and retain vegetation in place for as long as possible prior to removal. A vegetation rehabilitation plan should already be implemented during construction and include the following: <ul style="list-style-type: none"> No activities should take place during rainy events and at least 2 days afterwards. Where topsoil needs to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation where applicable. Never mix topsoil with subsoils or other spoil materials. Maintain site demarcations in position until the cessation of construction work. After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. Rehabilitation must take place immediately post construction and only use indigenous species naturally occurring in the area. 		<p>Edge effects into wetland- and riparian vegetation</p>

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (2b): Destruction or damage to large indigenous trees, as well as indigenous trees along the pipeline routes</p> <p>Nature: Trenching could sever tree roots and destabilise large trees. Trees often fall when the structural roots have been compromised, either by cutting or infection, causing damage to property. Removing large tree roots can make the tree unstable or unhealthy later. If large roots are removed or severed, the tree may not be able to get enough nutrients and water and could become unstable (Airhart & Zimmerman, 2003).</p>	<p>Medium</p>	<p>Planning:</p> <ul style="list-style-type: none"> • Avoid removing large, established indigenous trees where possible. Where damage to the trees cannot be avoided, the trees can be removed and replaced with the same species post construction. • Severed roots of street trees may be reduced with careful planning to avoid root damage. Trees could fall when the structural roots have been compromised causing damage to property. • Prior to trenching and construction, consult the municipal horticulturist and / or tree specialist to determine the potential damage to street trees, as well as preferred method to trench through tree roots. • Instead of trenching through roots, consider the option of boring under the roots. • Trenches adjacent to a trunk could cut of about 40% of the tree roots (Figure 11a) which could destabilise the tree in windy conditions. As per Airhart and Zimmerman (2003) trenches should ideally be dug outside of the drip line of trees where possible. The best route is to trench directly toward the tree trunk, but tunnel under the tree trunk. This will severe less roots. Alternatively, trench just one-third into the drip line from either side (Figure 8b) then tunnel under the middle of drip line to connect the trenches. • Pneumatic digging is a method that allows trenching through a tree's critical root zone without severing vital roots <p>Construction:</p> <ul style="list-style-type: none"> • Avoid removing street trees where possible. • It is recommended that a municipal horticulturist or certified Arborist be present where tree roots need to be cut. • Consider the option of boring under the roots as described above. 	<p>Low</p>	<p>Destabilized trees, damage to property and infections to roots, slowly killing trees.</p>

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Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
		<ul style="list-style-type: none"> • Tree roots damaged by digging trenches must be treated with an appropriate fungicide or sealant, in accordance with manufacturers specifications • Contractors must prevent root zone compaction, mechanical damage to trunks and branches and chemical spillage around tree roots. • Ensure that soil is replaced around tree roots to the same height as before. Roots may not remain exposed, and neither should soil be heaped higher around the roots and trunk than prior to construction. • No topsoil should be store against tree trunks. • Damaged indigenous trees must be replaced with the same species. 		
<p>Direct Impacts (2c): Removal / Destruction of protected plants and trees</p> <p>Nature: The construction of the development and pipeline routes could result in the removal of protected plant species, impact on their habitat, pollinators and inevitably the persistence of these species. This could put further strain on the already declining populations.</p> <p>The main concern is the provincial protected plants:</p> <ul style="list-style-type: none"> • <i>Spirostachys africana</i> (tamboti tree) • Succulent species (likely an <i>Orbea</i> species) <p>The national protected trees:</p> <ul style="list-style-type: none"> • <i>Sclerocarya birrea subsp africana</i> (morula) • <i>Combretum imberbe</i> (leadwood) <p>And the unidentified bulb, currently identified as a <i>Crinum</i> species.</p>	Medium	<p>Planning</p> <ul style="list-style-type: none"> • Construction is highly likely to impact on unknown bulbous species, provisionally identified as a <i>Crinum</i> species. If the specialist cannot go to site, the ECO should send an image of the bulb in summer or when in flower to assist in positive identification. This will determine follow-up action. The <i>Crinum</i> species (four individuals at the coordinate: 24° 2'50.42"S; 28°48'49.83"E) must be removed prior to construction and replanted in its original position post construction. • Where protected trees and plants cannot be avoided, apply for a permit from the relevant department (see below) for the removal or pruning of such trees: <u>Limpopo Department of Economic Development, Environment and Tourism</u> • <i>Spirostachys africana</i> (tamboti tree) • Succulent species (likely an <i>Orbea</i> species) 	Low	Species removed and relocated as part of rehabilitation could die due to transplantation shock or damage during replanting.

SECTION C: PUBLIC PARTICIPATION

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
		<p><u>Local Department of Forestry, Fisheries and the Environment:</u></p> <ul style="list-style-type: none"> • <i>Sclerocarya birrea subsp africana</i> (morula) • <i>Combretum imberbe</i> (leadwood) <p>Construction:</p> <ul style="list-style-type: none"> • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority. • Cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles. 		
<p>Direct Impacts (2d): Potential increase in invasive vegetation</p> <p>Nature: The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site.</p>	Medium	<ul style="list-style-type: none"> • Alien invasive species, in particular category 1b species that were identified on site must be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO. 	Low	Re-infestation in areas initially cleared.

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
		<ul style="list-style-type: none"> If filling material is to be used, this should be sourced from areas free of invasive species. No foreign plant matter or soil may be introduced into the area. 		
3. IMPACT ON FAUNA				
<p>Direct Impacts 3(a): Destruction of fauna habitat and ecological connectivity, Disturbance to fauna through noise, vibration and dust</p> <p>Nature: The limited on-site ESA provides the most significant natural habitat and very limited ecological corridor to fauna in the area but will only be partially affected by the pipeline replacement. Indiscriminate and uncontrolled activities within the CBAs could cause sedimentation of the downstream rivers and dams, alter the aquatic environment and impact on downstream environments.</p>	Low	<ul style="list-style-type: none"> No needless noise generation is permitted on site to reduce impact to the existing water birds in the area. Consider conducting the pipeline replacement during the dry season when birds are least likely to be breeding. Staff must be instructed to remain within designated operational areas only (outside all rocky habitats and avoid the edges of the dams where aquatic birds may be breeding). Staff and contractors should remain vigilant of potential fauna species, specifically the South African Hedgehog, which should be reported to the Environmental Officer if noted on site. Allow species the opportunity to freely move away from the area. If threatened by activities, then contract permitted specialists to relocate the species to the nearby surrounds. All potentially contaminating material (fuel, chemicals, waste, oils and lubricants, sewage, etc.) will be stored and handled according to best practice and will never be needlessly exposed to the environment. Spills will be actively monitored and cleared immediately to prevent contamination of the dam and downstream faunal habitats. All excavated earth material from the pipeline trench will be placed up-slope of the trench while pipelines are being placed, and then used to fill the trench. The area will then be levelled, seeded and rehabilitated. 	Low	Sedimentation could alter drainage patterns within the downstream aquatic ecosystems and reduce water holding capacity and flow characteristics important to ecosystems in the long term.
4. IMPACTS ON THE HERITAGE FEATURES				

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts: Direct or physical impacts, implying alteration or destruction of heritage features</p> <p>Nature: As no sites, features or objects of cultural heritage significance were identified on the project area, there would be no impact as a result of the proposed development</p>	Low	<ul style="list-style-type: none"> • Known sites should be clearly marked in order that they can be avoided during construction activities. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). 	Low	Low

5. VISUAL IMPACTS

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts:</p> <p>Pollution may occur due to the littering and illegal dumping on the site and surrounding areas which can affect the visual character of the site.</p>	<p>Low</p>	<ul style="list-style-type: none"> • Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council. • Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area; • The landscape must be rehabilitated in such a way that it corresponds to the surrounding topography; • Manage construction activities in accordance with the accepted/ approved construction EMPr. • Screen Construction site from neighbouring area by means of a fence and opaque cover/sheeting • Ensure appropriate housekeeping • No construction rubble, construction material, refuse, litter or any other material not found naturally in the surroundings should be allowed at any time to be lying around on the construction site 	<p>Low</p>	<p>Low</p>

6.NOISE IMPACTS

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts:</p> <ul style="list-style-type: none"> • Increase in noise pollution due to, among others, excavations and site clearing, noise from construction vehicles and construction staff and or drilling activities. • Noise pollution caused during construction could potentially be a nuisance to neighbouring residential areas. 	Low	<ul style="list-style-type: none"> • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction. • No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. • Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc) must be used as per operating instructions and maintained properly during site operations. • Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment. • Introduce a formal recording system/grievance mechanism to capture public perceptions and complaints with regard to noise impact. 	Low	Medium

7. IMPACTS ON THE AIR QUALITY

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts:</p> <p>Construction activities have the potential to be sources of fugitive dust on site. These include:</p> <ul style="list-style-type: none"> • Dust from access roads. • Dust from area cleared for construction. • Emissions from construction machinery and equipment. • Trucks transporting spoil and fill material. 	Low	<ul style="list-style-type: none"> • Dust suppression measures must be implemented on access roads and working areas during dry periods. • Water used for this purpose must be in quantities that do not result in the generation of run-off. • Adherence to speed limits on site roads to prevent the liberation of dust into the atmosphere must be enforced • All site workers will need to wear the appropriate PPE • Transported material that can be blown off as dust must • Contractor to provide method statement of site-specific dust control measures • A speed limit of 40km/h to be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent is required. 	Low	Low
8. TRAFFIC IMPACTS				
<p>Direct Impacts:</p> <ul style="list-style-type: none"> • Anticipated impact on traffic owing to construction vehicles and heavy vehicles delivering materials to the site. • Traffic congestion in and around the area may offend neighbouring property owners during the construction phase. 	Low	<ul style="list-style-type: none"> • Construction vehicles are not to be parked on the roads thereby blocking the way to the neighbouring properties. • Clear signs should be displayed and entrance to the site indicating a construction site and turning construction vehicles. • Construction vehicles are to avoid main roads during peak traffic hours and mitigation measures outlined in the EMP are to be implemented. • Ensure an appropriate access procedure to avoid backlog of traffic at the entry point to the site. 	Low	Low
9. SOCIAL ECONOMIC (POSITIVE IMPACTS)				

SECTION C: PUBLIC PARTICIPATION

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts: Employment Opportunities</p> <p>Nature: In terms of employment opportunities, the following should be considered:</p> <ul style="list-style-type: none"> • The number of jobs that would be created during the construction and operational phase of the proposed project; and • The extent to which certain groups such as the unemployed, disadvantaged and minority groups could be employed. • Typical of a project of this nature, some specialised skills are required although some opportunities for local labour in the unskilled and semi-skilled categories would be available even if only of a limited nature. At this stage the extent of labour required is not finalised. • Economic multiplier effects from the use of local contractors such as (waste transporters and security personnel used to provide services on site). 	<p style="text-align: center;">Low</p>	<p>Enhancement:</p> <ul style="list-style-type: none"> • It is recommended that local employment policy is adopted to maximize the opportunities made available to the local labour force. • Training and skills development programmes should be provided to all employees. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. 	<p style="text-align: center;">Medium</p>	<p>None, it is a positive impact</p>

IMPACTS THAT MAY RESULT FROM THE OPERATION PHASE

Table 8: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the OPERATION PHASE

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
1. IMPACT ON THE AQUATIC BIODIVERSITY				
<p>Direct Impacts (1a) Impacts to hydrological function at a landscape level</p> <p>Nature: Changes to hydrological function at a landscape level which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes). The extent of the modification in relation to the overall aquatic ecosystem (i.e. at the source, upstream or downstream portion, in the temporary, seasonal, permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.). Changes to base flows (e.g. too little/too much water in terms of characteristics and requirements of system). Fragmentation (e.g. road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and longitudinal).</p> <p>Activity: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction of the pipeline.</p>	Medium	<ul style="list-style-type: none"> After closure of the trench, the contours should resemble pre-development conditions. Where lateral water flow in the soil profile is intercepted by the trench and pipe, this water should be released back into the wetland in such a way as to not cause scouring or erosion 	Medium	<p>Expected to be low. The operational phase will not affect hydrological function on a landscape level, affect flood regimes or dynamic processes if no spills occur.</p>

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (1b): Changes in sediment entering and exiting the system</p> <p>Nature: Changes in sediment regimes of the aquatic ecosystem and its sub-catchment by for example sand movement, meandering river mouth /estuary, changing flooding or sedimentation patterns</p> <p>Activity: Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. This could result in the loss of topsoil, sedimentation of the watercourse and increase the turbidity of the water. Possible sources of the impacts include:</p> <ul style="list-style-type: none"> • Earthwork activities during construction • Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soils. • Disturbance of soil surface • Disturbance of slopes through creation of roads and tracks adjacent to the watercourse • Erosion (e.g. gully formation, bank collapse) 	<p>Low</p>	<ul style="list-style-type: none"> • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. • Monitoring should be done to ensure that sediment pollution is timeously dressed 	<p>Low</p>	<p>Expected to be limited provided that the mitigation measures are implemented effectively and sedimentation is appropriately managed.</p>
<p>Direct Impacts (1c): Introduction and spread of alien vegetation</p> <p>Nature: Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users.</p> <p>Activity: The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users.</p>	<p>Medium</p>	<ul style="list-style-type: none"> • Long-term monitoring for the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan • Rehabilitate or revegetate disturbed areas 	<p>Low</p>	<p>Expected to be limited provided that an Alien Plant Control Plan is effectively implemented</p>

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (1d): Loss and disturbance of watercourse habitat and fringe vegetation</p> <p>Nature: Assuming that earthworks will remain confined to road reserves vegetation clearing will likely not destroy wetland habitat.</p> <p>Activity: Loss and disturbance of watercourse habitat and fringe vegetation due to direct development on the watercourse as well as changes in management, fire regime and habitat fragmentation.</p>	Low	<ul style="list-style-type: none"> • Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed. • Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish 	Low	Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.
<p>Direct Impacts (1e): Changes in water quality due to input of foreign materials e.g. due to increased sediment load, contamination by chemical and /or organic effluent, and /or eutrophication</p> <p>Nature: Changes in water quality due to input of foreign materials e.g. due to increased sediment load, contamination by chemical and /or organic effluent, and /or eutrophication</p> <p>Activity: Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the watercourses and a reduction in watercourse function.</p>	Medium	<ul style="list-style-type: none"> • Ensure that sewage infrastructure include emergency measures to contain spills, for example emergency by-pass lines • Ensured that regular maintenance takes place to prevent failure of any infrastructure associated with the proposed development; • The managing authority should test the integrity of the sewer pipelines at least once every five years or more often should there be any sign or reports of a leak. • Standard Operating procedures, training drills and audits should be put in place and revised annually. • A detailed rehabilitation plan should be drawn up with the input from a water quality, soil contamination assessment and ecologist should any spills occur. • Independent water quality analyses should be undertaken annually, or as specified by an aquatic specialist, to demonstrate and audit compliance of effective pollution control measures 	Medium	Although it may be controlled and largely prevented, the impact of a single spill will have a significant residual effect on the local watercourse integrity. Residual risks should therefore be considered significant

2. IMPACT ON VEGETATION

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (2a): Destruction of vegetation of low and medium sensitivity</p> <p>Nature: The development will require the removal of the modified vegetation within and around the residential area of Ga-Pila Village. All removal of vegetation, whether sensitive or not, could have an impact on soil stabilisation and water infiltration.</p> <p>Activity: The sources of this impact could include:</p> <ul style="list-style-type: none"> • Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers; • Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction. 	<p>Medium</p>	<ul style="list-style-type: none"> • Rehabilitate construction camps and any other grassland vegetation that was impacted on by the construction. Use grass sods that were removed prior to construction to rehabilitate the construction footprints. Sods must not be stored for lengthy periods and should not be stacked on top of each other or on top of grazed and moist grasslands. The sods should preferably be removed during the winter months and replanted by springtime latest. • Rehabilitation will be successful when the current status quo of mowed grassland and planted indigenous trees are attained. • Only indigenous plant species, naturally occurring in the Mkhado Sweet Bushveld, for rehabilitation. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, animal or pedestrian access. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to. • Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO. 	<p>Low</p>	<p>Localised alteration of soil surface characteristics and loss of flora.</p> <p>Edge effects into wetland- and riparian vegetation</p>

SECTION C: PUBLIC PARTICIPATION

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (2b): Destruction or damage to large indigenous trees, as well as indigenous trees along the pipeline routes</p> <p>Nature: Trenching could sever tree roots and destabilise large trees. Trees often fall when the structural roots have been compromised, either by cutting or infection, causing damage to property. Removing large tree roots can make the tree unstable or unhealthy later. If large roots are removed or severed, the tree may not be able to get enough nutrients and water and could become unstable (Airhart & Zimmerman, 2003).</p>	Medium	<ul style="list-style-type: none"> Avoid damage to trees and tree roots. 	Low	Destabilized trees, damage to property and infections to roots, slowly killing trees.
<p>Direct Impacts (2c): Removal / Destruction of protected plants and trees</p> <p>Nature: The construction of the development and pipeline routes could result in the removal of protected plant species, impact on their habitat, pollinators and inevitably the persistence of these species. This could put further strain on the already declining populations.</p> <p>The main concern is the provincial protected plants:</p> <ul style="list-style-type: none"> <i>Spirostachys africana</i> (tamboti tree) Succulent species (likely an <i>Orbea</i> species) <p>The national protected trees:</p> <ul style="list-style-type: none"> <i>Sclerocarya birrea subsp africana</i> (morula) <i>Combretum imberbe</i> (leadwood) <p>And the unidentified bulb, currently identified as a <i>Crinum</i> species.</p>	Low	<ul style="list-style-type: none"> Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to. 	Low	Species removed and relocated as part of rehabilitation could die due to transplantation shock or damage during replanting.

SECTION C: PUBLIC PARTICIPATION

Potential impacts:	Significance rating of impacts	Proposed mitigation:	Significance rating of impacts (with Mitigations)	Risk of the impact and mitigation not being implemented
<p>Direct Impacts (2d): Potential increase in invasive vegetation</p> <p>Nature: The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site.</p>	Medium	<ul style="list-style-type: none"> Only use indigenous species, naturally occurring in the area, to rehabilitate the disturbance footprint. Monitor and control the rehabilitated areas remove alien invasive species as soon as they become apparent. 	Low	Re-infestation in areas initially cleared.
4. IMPACT ON FAUNA				
<p>Direct Impacts 3(a): Destruction of fauna habitat and ecological connectivity, Disturbance to fauna through noise, vibration and dust</p>	Low	<ul style="list-style-type: none"> All excavated earth material from the pipeline trench will be placed up-slope of the trench while pipelines are being placed, and then used to fill the trench. The area will then be levelled, seeded and rehabilitated. 	Low	None
5. IMPACT ON EXISTING SERVICES				
<p>Direct Impacts: Improved Bulk Sewer Services in the area.</p> <p>Nature: The objective of the project is to improve the sanitation infrastructure in Ga-Pila village by replacing all the plastic septic tanks with a more sustainable full waterborne sanitation system, this approach proposes a sustainable sanitation solution for the Ga-Pila community. The aim of the assignment is to provide a sustainable conventional gravity waterborne sewerage and wastewater treatment system in the Ga-Pila village.</p>	Low	<ul style="list-style-type: none"> Not applicable as this is a positive impact. 	Medium	None

6. NO-GO

This is **the option of not upgrading the Ga-Pila Sanitation system** and will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. The existing under-capacitated sewers are based on hydraulic analysis capacity requirements at ultimate development flows to obviate any further blockages or spillages. In summary the situation on the ground will remain the same and the `do nothing alternative` will not assist the Mogalakwena Local Municipality in addressing issues that require quick emergency response as detailed above. **The cost of the `do nothing alternative` are expected to outweigh the benefits and therefore this alternative is not a preferred alternative**

Table 9: Potential impacts should the Development not be Approved ("No-Go" Alternative)

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Impact on Aquatic Biodiversity	Low (+ve)	There are no mitigation measures	Negligible	No risk
Impact on Fauna and flora	Low (+ve)	There are no mitigation measures	Negligible	No risk
Visual Impacts	Low (+ve)	There are no mitigation measures	Negligible	No risk
Noise Impacts anticipated	Low (+ve)	No noise disturbance to neighboring residential estate	Negligible	Low
Loss and disturbance of heritage sites due to the development.	Low (-ve)	There are no mitigation measures	Negligible	No risk
Social impacts	Low (-ve)	There would have to be alternative employment opportunities	Negligible	No risk

7. CUMULATIVE IMPACTS

Cumulative impacts can result from an effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development.

The anticipated cumulative impacts of this development include the following:

- Changes to hydrological function Moderate. Watercourses in this area are somewhat impacted and any further degradation will add to regional deterioration of integrity of watercourses.
- Changes in sediment entering and exiting the system: Expected to be low. Should mitigation measure not be implemented effectively, sediment deposition may affect the capacity of downstream culverts which may cause flooding. Reversing this process is unlikely and should be prevented in the first place.
- Loss and disturbance of watercourse: **Expected to be moderate** since the development footprint lies within the delineated watercourse
- Changes in water quality: **Expected to be low** given that standard best practice is followed during construction
- Introduction and spread: Cumulative impacts: Several invasive species are present within the area that the proposed development is situated in. Therefore, if mitigation measures to limit and prevent the spread of alien species are not implemented, the cumulative impact could lead to remaining natural vegetation transformed by alien plant species.
- Destruction or damage to large indigenous trees, as well as indigenous trees along the pipeline routes Reduction in street trees and impact on micro-climate and vertebrate habitat .
- Cumulative Impacts on the socio-economic up-liftment as a result of the proposed development (Positive Impact), constructing the proposed development will result in additional jobs being created in the area and skills development during the construction phase. Due to the high unemployment rate in the study area. The positive impact will be very low positive but with enhancement it can be low positive.

*Generally, the **cumulative impact** is rated as **Low** for the larger part of the project as it falls within developed areas, however the cumulative impacts on the wetland area could be medium significance should mitigation measure not be implemented as changes made to the bed or banks of watercourse and unstable channel conditions may result causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place.*

8. ENVIRONMENTAL IMPACT STATEMENT

Summarised Findings of the Specialist Studies:

Aquatic Biodiversity & Wetland Assessment: Three watercourses were identified within and on the outskirts of the study site. These watercourses are all classified as non-perennial. The western watercourse is classified as a Non-Perennial Ephemeral River, and the streams in the middle and east are classified as Non-Perennial Episodic Streams. All the watercourses flow in a northerly direction toward the Mogalakwena River although some are interrupted by residential housing and/or agricultural lands. Additionally, artificial wet areas were recorded near the waste water dam. These artificial wet areas are due to sewerage leaks, Stormwater flow and potential seepage from the dam. Although some wetland vegetation occurs here, these areas are artificial in nature and will likely disappear when the water input sources are removed.

Impacts expected to be associated with the construction of the proposed sewage infrastructure adjacent to, and within the watercourse buffer zones are associated with extensive earthworks in a specialised habitat in the construction phase, and potential spills during the operational phase. Upgrade of sewer infrastructure is likely to have a nett positive impact on water quality in the area since spills are expected to be reduced. Temporary disturbance of local specialised habitat, sedimentation and construction-related pollution can be effectively managed, mitigated and rehabilitated, however, the risk of damaging specialised habitat is significant. The potential spill of sewage should infrastructure fail during the operational phase will result in significant negative impacts to water quality. However, installation of upgraded sewage infrastructure is likely to decrease sewage spills in this area and is likely to contribute to improved water quality. It is important that any mitigation be implemented in the context of an Environmental Management Plan in order to ensure accountability and ultimately the success of the mitigation.

Vegetation: Most of the vegetation that the proposed project will impact on was found to be modified from the reference state of Mukhaddo Sweet Bushveld and of a low sensitivity to the proposed development. This contradicts the national web-based screening tool results which indicate that the falls within an area of High Terrestrial Biodiversity Sensitivity, triggered by Ecological Support Areas. Most of the vegetation that will directly be impacted on was historically cultivated, while areas to the north of Ga-Pila Village are currently cleared and fenced for informal houses. However, the vegetation surrounding the village contain natural vegetation, while vegetation within the drainage lines, which constitutes the Ecological Support Areas, must be disturbed with caution and rehabilitated post construction. The Vegetation Assessment agrees with the national web-based screening tool results, in that the POAI are unlikely to impact on any plant species of conservation concern and thus the low sensitivity rating is supported. The area that the proposed site is situated in is not known for threatened, endemic or protected plant species. Only one (1) plant species of conservation concern that might be present in the area were shortlisted. This species is more likely to be present in the rocky hills surrounding Ga Pila Village. This assessment found that the vegetation within the PAOI does not pose a fatal flaw to the proposed sewer upgrade and that the project can proceed if mitigation measures as set out in this report are adhered to as a minimum.

Heritage: As no sites, features or objects of cultural heritage significance were identified on the project area, there would be no impact because of the proposed development.

Palaeontological: The Sensitivity Map (<http://www.sahra.org.za/sahris/map/palaeo>) indicate that project area mostly has an

insignificant to zero sensitivity of fossil remains to be found and therefore no paleontological studies are required

Overall Summary: Impacts expected to be associated with the upgrade of the proposed sewage infrastructure adjacent to, and within the watercourses and associated buffer zones are associated with earthworks in the construction phase, and potential spills during the operational phase. Upgrade of sewer infrastructure is likely to have a net positive impact on water quality in the area since spills are expected to be reduced. Temporary disturbance of local wetland habitat, sedimentation and construction-related pollution can be effectively managed, mitigated and rehabilitated, however the extent of trenching expected to occur in the watercourse is extensive and may have a significant negative impact. The potential spill of sewage should infrastructure fail will result in significant negative impacts to water quality. However, installation of upgraded sewage infrastructure is likely to decrease sewage spills in this area and is likely to contribute to improved water quality. It is important that any mitigation be implemented in the context of an Environmental Management Plan in order to ensure accountability and ultimately the success of the mitigation.

The benefits of the project are expected to outweigh the costs.

A number of mitigation and monitoring measures have been identified which would allow for the minimisation and management of potential environmental impacts associated with the proposed development, which have been incorporated into the EMP (Appendix F) for the project, which will be further developed during the detailed planning and construction phase of the project.

It is the opinion of Envirolution Consulting (Pty) Ltd that the proposed project will not have a significant environmental impact and is therefore preferred as it is considered to be sustainable from an environmental perspective.

9. IMPACT SUMMARY

For Proposal

A summary of the impact assessments is presented in **Table 11 and 12**; the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (I.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

< 30	Low significance
30 to 60	Moderate significance
>60	High significance

It must be noted that the impact scores in **Table 10 & 11** below are not intended to be definitive measures of environmental impact, but they are a useful guide to evaluating the overall environmental performance of a new development and they assist in interpreting key influences of a development

Table 10: Impact Summary table: **CONSTRUCTION PHASE**

Environmental Aspect	Without Mitigation	With Mitigation
IMPACT ON THE AQUATIC BIODIVERSITY		
Changes in water flow regime	Medium	Medium
Changes in sediment entering and exiting the system	Medium	Medium
Introduction and spread of alien vegetation.	Medium	Low
Loss and disturbance of wetland habitat and fringe vegetation.	Medium	Medium
Changes in water quality due to foreign materials and increased nutrients.	Medium	Low
IMPACT ON VEGETATION		
Destruction of vegetation of low and medium sensitivity	Medium	Low
Destruction or damage to large indigenous trees, as well as indigenous trees along the pipeline routes	Medium	Low
Removal / Destruction of protected plants and trees	Medium	Low
Potential increase in invasive vegetation	Medium	Low
IMPACTS ON FAUNA		
Destruction of fauna habitat and ecological connectivity	Low	Low
Disturbance to fauna through noise, vibration and dust	Low	Low
HERITAGE IMPACT		
Loss and disturbance of heritage sites due to the development	Low	Low
OTHER POTENTIAL IMPACTS		
Change in visual character of the area	Low	Low
Noise Impacts anticipated	Low	Low

Air Quality impacts	Low	Low
Traffic impacts	Low	Low
Employment Opportunities (Positive Impact)	Low	Medium
Table 11: Impact Summary table: OPERATIONAL PHASE		
Environmental Aspect	Without Mitigation	With Mitigation
IMPACT ON THE AQUATIC BIODIVERSITY		
Changes in water flow regime.	Medium	Medium
Changes in sediment entering and exiting the system	Low	Low
Introduction and spread of alien vegetation.	Medium	Low
Loss and disturbance of wetland habitat and fringe vegetation.	Low	Low
Changes in water quality due to foreign materials and increased nutrients.	Medium	Low
IMPACT ON VEGETATION		
Destruction of vegetation of low and medium sensitivity	Low	Low
Destruction or damage to large indigenous trees, as well as indigenous trees along the pipeline routes	Low	Low
Removal / Destruction of protected plants and trees	Low	Low
Potential increase in invasive vegetation	Low	Low
IMPACTS ON FAUNA (Terrestrial)		
Destruction of fauna habitat and ecological connectivity	Low	Low
Disturbance to fauna through noise, vibration and dust	Low	Low

For alternative:

Please refer to Table 7 & 8
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Table 11 & 12 gives a summary of the impact significance established through the basic assessment investigation, from this summary it is apparent that the significance levels of the majority of identified impacts are of Medium-Low significance for all alternatives investigated and this can further be reduced to acceptable low significance levels thus, the proposed developments could proceed provided that the mitigation measures set out in this report and in the EMPR and the Rehabilitation Plan (Appendix E) are diligently implemented to limit the potential impacts on vegetation, watercourses and social during construction and operation of the developments. Apart from the anticipated Construction phase impacts, which would be temporary (short-term duration), other impacts identified (including cumulative impacts) are associated with ecological aspects, waste and potential, but slight, increase in traffic volumes. Where impacts are unavoidable, they have been found to be of moderate to low significance according to the criteria used and furthermore, can be mitigated through appropriate design and effective implementation of the EMPR.

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	
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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):

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 project will result in some unavoidable environmental impacts during construction but this is not a fatal flaw. The nature of the project has been planned in such a way that there are minimal negative environmental impacts. None of these adverse impacts are considered unacceptably significant and all can be managed to acceptable levels through the effective implementation of the recommended mitigation measures. In addition, the project will provide benefits to the local community in terms of service provision and job creation, this the assessment process has shown that the proposed the project’s benefits outweigh the potential negative impacts.

A number of mitigation and monitoring measures have been identified which would allow for the minimisation and management of potential environmental impacts associated with the proposed development. These have been incorporated into the EMPr (**Appendix F**). This Report has identified and assessed the potential impacts on the environment associated with the proposed Ga-Pila Village Sanitation Upgrade and associated infrastructure. It is therefore proposed that authorisation is granted.

Envirovolution Consulting (Pty) Ltd recommends that the project be considered for approval subject to the following general recommendations:

- A final detailed layout must be submitted to the relevant authority for approval prior to commencement with the project; other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated watercourse or associated buffer zones.
- The EMPr should be a legal binding document and an extension of the Environmental authorisation once issued by LEDET, the appointed contractor should be contractually bound to comply with the conditions of the EMPr
- An independent ECO should be present during construction to monitor the implementation of the EMPr and the environmental authorization once issued and compile monthly audit report for submission to the relevant authorities
- Avoid, as far as reasonably possible, disturbing wetlands within the study area. Where this is unavoidable, appropriate remediation steps must be taken
- Adequate measures must be put in place to prevent polluted runoff water from entering the, watercourses, thus

preventing surface and groundwater pollution.

- A Stormwater Management Plan is subject for approval by JRA prior to the Site Development Plan stage. Management of stormwater will also need to be designed in such a manner as to prevent negative impacts such as erosion and sedimentation, and to ensure environmental protection of downstream areas.
- All relevant legislation and requirement of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
- A Water Use License must be obtained from Department of Water and Sanitation prior to the commencement of construction activities.
- Construction camps can be placed within road verges, or modified vegetation within the Ga-Pila Village. However, these areas must be rehabilitated to the current status quo.
- An independent Ecological Control Officer (ECO) should be appointed to oversee construction.
- Rehabilitation must take place immediately post construction and only use indigenous species naturally occurring in the area.
- Alien invasive species, in particular category 1b species that were identified on site must be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
- Monitor and control the rehabilitated areas remove alien invasive species as soon as they become apparent.
- Avoid removing large, established indigenous trees where possible. Where damage to the trees cannot be avoided, the trees can be removed and replaced with the same species post construction.
- Where protected trees and plants cannot be avoided, apply for a permit from the relevant department (see below) for the removal or pruning of such trees:

Limpopo Department of Economic Development, Environment and Tourism

- *Spirostachys africana* (tamboti tree)
- Succulent species (likely an *Orbea* species)

Local Department of Forestry, Fisheries and the Environment:

- *Sclerocarya birrea subsp africana* (morula)
- *Combretum imberbe* (leadwood)

Is an EMPr attached?

YES

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: Public Participation

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Other information

SECTION G: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, _____, 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:

Name of company:

Date: