DRAFT BASIC ASSESSMENT REPORT

THE PROPOSED UPGRADE OF THE LEEUWKUIL WASTEWATER TREATMENT CONVEYANCES WITHIN THE EMFULENI LOCAL MUNICIPALITY, GAUTENG PROVINCE

GE39165

July 2022

GDARD REF: GAUT 002/22-23/E3191

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DRAFT BASIC ASSESSMENT REPORT: THE PROPOSED UPGRADE OF THE LEEUWKUIL WASTEWATER TREATMENT CONVEYANCES WITHIN THE EMFULENI LOCAL MUNICIPALITY, GAUTENG PROVINCE

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Preliminary

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Approval

The signatures below certify that this document has been reviewed and approved.

	Name	Signature	Position	Date
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Approved by	Barend Smit		Senior Environmental Scientist	30/08/2022

Amendment Record

This document is reviewed to ensure its relevance. A record of contextual additions or omissions is given below.

Rev No.	Issue Date	Revision Description	Prepared By	Reviewed By	Approved By
0	31/08/2022	First Draft	L. Ferreira	B. Smit	B. Smit
1					

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The Parties shall comply with any applicable data protection legislation regulating the processing of personal information, including the Protection of Personal Information Act, 2013 (POPIA) and any regulations issued in terms of POPIA that may apply in relation to the processing of any personal information in connection with this agreement.

Without derogating from the generality of the aforegoing, the receiving Party agrees that it will:

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- process any personal information provided to it by the Company only with the knowledge or authorisation of the Company and only for the purpose for which the personal information was provided;
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- verify, upon request, that all security measures that are in place are effectively implemented;
- conduct regular assessments to identify all reasonable foreseeable internal and external risks to the personal information provided by The Company in its possession or control and update and align the security measures with the risks identified;
- not transfer or process personal information outside of South Africa to recipients that are not subject to adequate data protection laws unless the written consent of the Company is obtained and, where applicable, the necessary regulatory approval has been granted;
- only retain the personal information for as long as is reasonably necessary to perform the services in terms of this Agreement and shall return, delete or destroy such information after the lapse of the applicable retention period as prescribed by law, or upon the expiry or termination of this Agreement, or within ten (10) days of a written request by the Company requesting the handing over of or deletion of such personal information, whichever occurs first, unless otherwise agreed to in writing upon between the parties; and

In the event that the receiving Party has reasonable grounds to believe that the personal information provided to it by the Company has been accessed or acquired by any unauthorised person (a Data Breach), the receiving Party shall immediately notify the Company in writing of such Data Breach, and shall provide the Company with all reasonable assistance in order to mitigate the effects of such Data Breach.

The Operator hereby indemnifies and holds the Company and/or any of its directors, officers or any other officials thereof respectively, harmless against any and all loss, damage, costs (including legal costs on an attorney and client basis), charges, penalties, fines and/or expenses which may be incurred or sustained by the Company and/or any one or more of the aforesaid persons as a result of the Operator having failed to comply with this clause and with any applicable data protection legislation.

Abbreviations and Acronyms

List of Abbreviations and Acronyms	
BA	Basic Assessment
BAR	Basic Assessment Report
BNRAS	Biological Nutrient Removal Activated Sludge
CARA	Conservation of Agricultural Resources
CRR	Comments and Response Report
DBAR	Draft Basic Assessment Report
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC	Electrical conductivity
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ELM	Emfuleni Local Municipality
EMF	Environmental Management Framework
EMP	Environmental Management Programme
ESDF	Emfuleni Spatial Development Framework
FBAR	Final Basic Assessment Report
GDARD	Gauteng Department of Agriculture and Rural Development
GPEMF	Gauteng Environmental Management Framework
GPS	Global Positioning System
HDPE	High-Density Polyethylene
HGM	Hydrogeomorphic
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IBBA	Important Bird and Biodiversity Areas
IDP	Integrated Development Plan
NBSA	National Spatial Biodiversity Assessment
NDP	National Development Programme
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NHRA	National Heritage Resource Authority
NWA	National Water Act
PAIA	Promotion of Access to Information Act
PAOI	Project Area of Influence
PIA	Palaeontological Impact Assessment
POPIA	Protection of Personal Information Act, 2013

SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resources Information System
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDM	Sedibeng District Municipality
SRSS	Sedibeng Regional Sanitation Scheme
WUL	Water Use License
WULA	Water Use License Application

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EXECUTIVE SUMMARY

GIBB Environmental (Pty) Ltd (GIBB) has been appointed as the independent Environmental Assessment Practitioner (EAP) by GIBB (Pty) Ltd on behalf of the Emfuleni Local Municipality (ELM) to undertake the application process for Environmental Authorisation (EA), subject to a Basic Assessment (BA) process for the Leeuwkuil Wastewater Treatment Conveyances project.

The Applicant, ELM, has identified the need for the Sedibeng Regional Sanitation Scheme (SRSS) project. The SRSS is a project which aims to create bulk sanitation capacity in the Sedibeng region, deliver effective solutions to prevent pollution of water resources and unlock development projects that require sanitation services within the Emfuleni and Midvaal Municipal areas including the Sebokeng, Vanderbijlpark, Vereeniging and Meyerton sewage catchments. The Leeuwkuil Wastewater Treatment Conveyances project forms part of the overall SRSS.

The Leeuwkuil Wastewater Treatment Conveyances project comprises approximately 32 km of sewerage pipeline conveyances that will be upgraded, which in turn will improve sludge management at the Leeuwkuil Waste Water Treatment Works (WWTW) and cater for future planned developments. This project will accommodate sewage flows from the south Sebokeng catchment, Vereeniging catchment and Vanderbijlpark catchment and cater for the future planned development. In addition, the project will allow the integration of the Vereeniging and Vanderbijlpark catchments to create flexibility in the sewerage system for both catchments, and allow for transfer of sewage from Vanderbijlpark catchment to the regional Rietspruit WWTW.

In addition to the above, the project will also include the upgrading and refurbishing of five pumpstations (PS2B, PS3D, PS4B, PS5 and PS10). Most of the pump station within the study area fall within the Vereeniging catchment and have been designed to cater for the project sewage flow. The pumpstation are located here:

- PS2B: 26°40'27.36"S; 27°54'26.72"E
- PS3D: 26°39'7.30"S; 27°55'7.30"E
- PS4B: 26°40'47.94"S; 27°53'11.89"E
- PS5: 26°39'46.32"S; 27°57'27.52"E
- PS10: 26°40'50.26"S; 27°56'9.55"E

The application covers only the sections of pipeline that actually triggers listed activities (i.e. sections of pipeline that are in sensitive environments) in total approximately 3,5 km, and not the entire pipeline route of 32 km.

Refer to **Figure 1** below for a Locality Map of the proposed development, that indicate the entire pipeline route as well as the sections that is subject of this application.

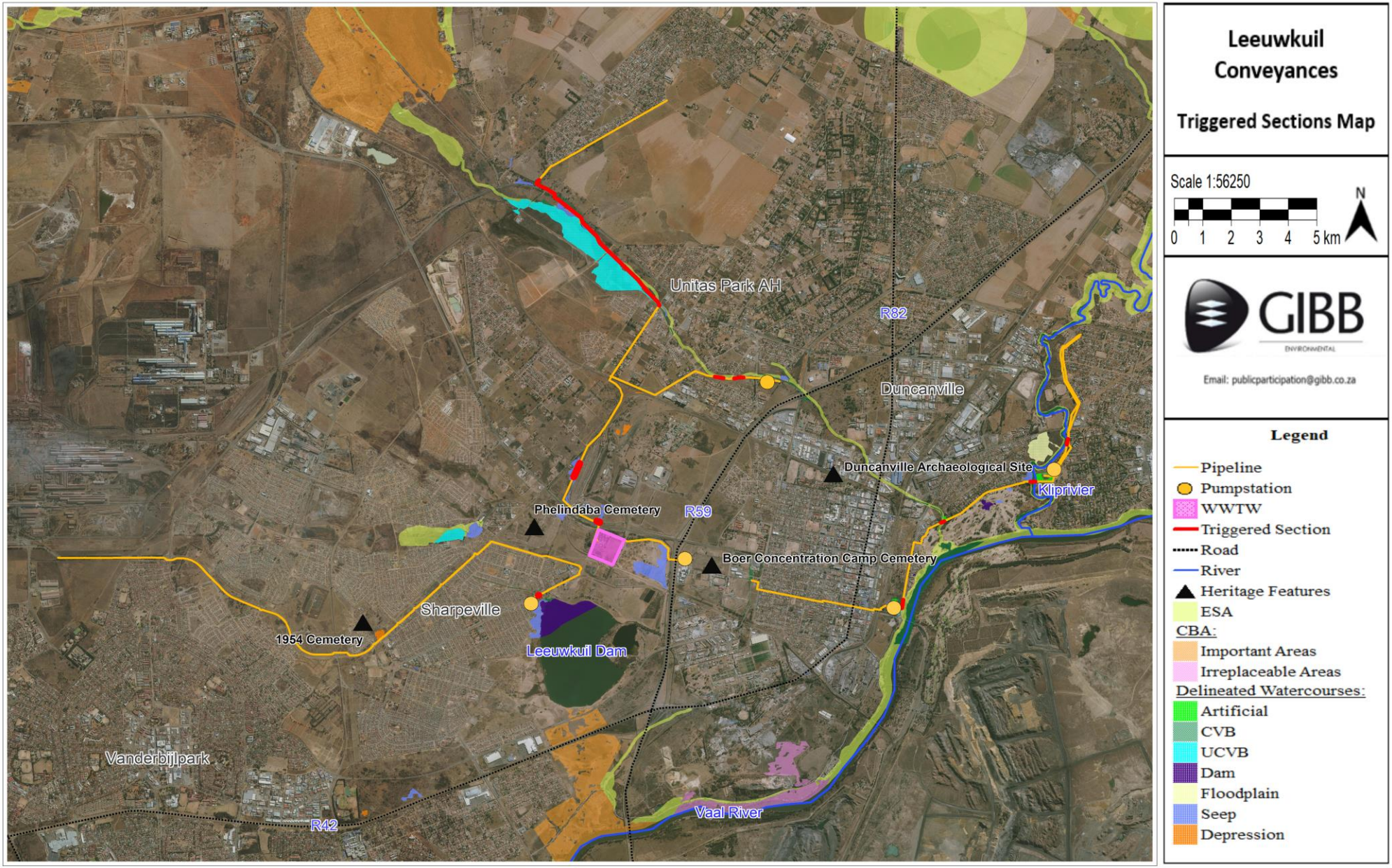

Figure 1: Locality Map of the proposed Leeuwkuil conveyances

The upgrade of the proposed Leeuwkuil conveyances will require the excavation and removal of in excess of 10 m^3 of material from watercourses and require the clearance of of vegetation on an area of more than 300 m^2 within Ecological Support Areas. This triggers activities in **Listing Notice 1 (GN R 327)** and **Listing Notice 3 (GN R 324)** of the **Environmental Impact Assessment (EIA) Regulations, 2014 (as amended)** (refer to **Table 1**).

Table 1: Listed activities triggered by the proposed development

No.	Activity number	Activity Description	Applicability
327	***19***	*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;* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.*	The surface water resources which will be affected by the proposed installation of the sewer line, i.e. the Vaal River, Kliprivier and various wetland areas, meets part (b) and (c) of the definition of a watercourse as set out in the EIA Regulations 2014 (as amended). The proposed activity will require the excavation and removal of in excess of 10 m^3 of material from the watercourses, which triggers this listed activity. Since none of the listed exclusions are applicable, this Listed Activity is triggered and requires an Environmental Authorisation (EA) subject to a Basic Assessment (BA) process prior to commencement.
324	***12***	*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *c. Gauteng* *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within Critical Biodiversity Areas or*	The proposed development will require the clearance of an area of more than 300 m^2 within Ecological Support Areas as identified in the Gauteng Conservation Plan. Since the development is not required for maintenance purposes undertaken in accordance with a maintenance management plan, this Listed Activity is triggered and requires an EA subject to a BA process prior to commencement.

		Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or *iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.*	

The pipeline development will extend through an identified stream (the Klipriver) and will also be situated within 500 m of a delineated wetland features. As a result, the following water uses in terms of Section 21 of the NWA will be applicable to the project (**Table 2**).

Table 2: Water uses triggered in terms of Section 21 of the National Water Act

No.	Activity Description	Applicability / Relevance
Section 21 of the National Water Act		
c	*impeding or diverting the flow of water in a watercourse*	The Wetland Delineation, Impact Assessment and associated Risk Assessment undertaken for the project confirmed the presence of watercourses and wetlands within 500 m of the development, and that proposed sewer infrastructure will be routed through a watercourse. As such, these water uses under Section 21 of the NWA will apply to the project.

The following specialist studies have been undertaken and are attached to **Appendix G** of this DBAR:

1. Geohydrological Impact Assessment

A Geohydrological Impact Assessment (GIA) was undertaken by SRK Consulting (South Africa) Pty Ltd. The GIA determined that the Leeuwkuil project area is underlain by the Vryheid Formation as well as the Chuniespoort Group which comprises of dolomite. The dolomite is mapped in the northern parts of Leeuwkuil. The general soil type identified within the Leeuwkuil footprint is PT1 which is a red, yellow and / or greyish soil with low to medium base status and is found to be moderately deep (450 – 750 mm).

The groundwater potential for the areas underlying Leeuwkuil is very low (10 – 20 %) and the aquifer is classified as a minor aquifer region – therefore being a moderately–yielding aquifer system of variable water quality. The central and northern area of the Leeuwkuil project is underlain by predominantly carbonate rocks (dolomite) with groundwater occurring in a Karst aquifer (dolomite) with expected yields exceeding 5 L/s. The expected electrical conductivity (EC) is 0 – 70 mS/m with a portion of the along the Vaal River having a poorer EC of 70 – 300 mS/m.

The following groundwater sensitive zones were identified as having a higher risk of groundwater pollution and the following buffer zones should be applied when the proposed infrastructure is either close of located within these zones:

- Dolomitic areas – high groundwater abstraction zone and sensitive areas to sinkhole forming. Dolomite is soluble, i.e. dissolves in water. Rainwater and percolating ground water gradually dissolve the rock over time as it seeps through joints, fractures and fault zones in the rock – leading to the forming of sinkholes;

- Perennial rivers / streams – 100 m buffer;
- Non-perennial rivers / streams – 75 m buffer; and
- Boreholes and springs – 100 m buffer.

From the GIA, it was concluded that the proposed project will have low impact on groundwater quality and volume degradation provided that the mitigation measures and groundwater quality monitoring is implemented.

2. Heritage Impact Assessment

A Heritage Impact Assessment was undertaken by Beyond Heritage (Pty) Ltd, and a site visit was conducted on 10 June 2022 in order to survey the proposed project area. Although the Vanderbijlpark area is known for its historical events such as the discovery of the new coal fields, the expanding steel production and the struggle against Apartheid, the impact on heritage resources was determined to be very low. The proposed project is located along the existing sewerage pipelines which is highly disturbed and is also therefore considered to be of low heritage potential. However, during the site visit the following observation were recorded:

Cemetery 1954:
A cemetery (in a small open filed) dating back to 1954 is situated in Mareka Street, Sharpeville, Vereeniging but is currently occupied by informal squatter camps, illegal dumping and grazing animals. The graves are situated approximately 309 m from the proposed conveyances and will therefore not be impacted upon by the upgrade.

Phelindaba Cemetery:
The Phelindaba Cemetery (also referred to as the Sharpeville Massacre victims Grave Sites) is located in Theunis Kruger Street in Vereeniging and was declared as a National Heritage site by SAHRIS in 2016. The cemetery is however surrounded by formal concrete palisade fencing and is more than 30 m from the proposed conveyance upgrade. The Phelindaba Cemetery will therefore not be impacted upon.

Boer Concentration Camp Cemetery:
A Boer Concentration Camp Cemetery was observed in Nic Botha Street, Three Rivers in Vereeniging. As with the Phelindaba Cemetery, this Cemetery is formally fenced and secured and is situated more than 30 m from the proposed conveyance upgrade and will not be impacted upon.

Duncanville Archaeological Site:
The Duncanville Archaeological Site in situated in the wider study area and away from the proposed project area. This Archaeological Site was declared a Provincial Heritage Site by SAHRIS in 1944.

3. Palaeontological Impact Assessment

A desktop Palaeontological Impact Assessment was undertaken by Professor Marion Bamford from the University of the Witwatersrand during the month of June 2022. The desktop assessment indicated that the proposed project area lies within Quaternary sands and alluvium to the west and within the Vryheid Formation (Ecca Group and Karoo Supergroup) to the east. The quaternary sands and alluvium are regarded as moderately sensitive whereas the Vryheid Formations is regarded as highly sensitive. It is, however, extremely unlikely that any fossils are preserved in the Quaternary sands and alluvium. Fossils may be found within the Vryheid Formation and consequently a Fossil Chance Find Protocol has been added to the Environmental Management

Programme (EMPr). The overall impact on palaeontological resources was determined to very low to low and no further palaeontological impact assessment is required (unless fossils are found during the construction period).

4. Wetland Assessment Report

A Wetland Assessment Report was compiled by EP3 Environmental (Pty) Ltd which identified 13 Hydrogeomorphic (HGM) units within the project area. The HGM units were grouped into 4 groups (i.e. group 1a, 1b, 2 and 2b) based on ecological state and hydroperiod. The Present Ecological State (PES) of Group 1 (a and b) wetlands are Moderately Modified (HGMs 1 – 5), while Group 2 (a and b) wetlands varied between Largely Modified (HGMs 7 and 8), Seriously Modified (HGMs 9, 11, 12 and 13) and Critically Modified (HGMs 6 and 10). Ecosystem Services scores ranged from Moderately High to Low with the general trend decreasing with a decrease PES. HGM 2 exhibited a Moderately High score, HGMs 1, 3, 4, 7, and 9 obtained a Moderate score whereas HGMs 5 and 11 was considered Moderately Low with HGMs 6, 8, 10, 12, and 13 considered as Low. A similar gradient was noted in Ecological Importance and Sensitivity (EIS) where scores decreased from Group 1a to Group 2b. Scores varied from High (HGMs 1 – 5, and 9), through Moderate (HGMs 6 – 9, 11, and 12), to Low (HGMs 10 and 13). Refer to **Figure 1** for delineated watercourses.

The Impact Assessment concluded that moderate risks are to be expected during the construction phase of the project which can be reduced to a low risk should mitigation measures be implemented. During the operational phase of the project, the anticipated risks are determined to be moderate to low. The wetland report further stipulates that a buffer zone of 20 metres should be implemented around wetland areas and recommends that a wetland rehabilitation or offset plan be drawn up.

From the wetland assessment, it was concluded that the proposed project is feasible and that the upgrades to conveyances will greatly improve the condition of numerous wetland areas within the Leeuwkuil footprint.

5. Ecological Impact Assessment

An Ecological Impact Assessment was undertaken by Afzelia Environmental Consultants (Pty) Ltd from the 30th of May 2022 until the 1st of June 2022. The Leeuwkuil footprint falls within the Soweto Highveld Grassland vegetation unit which is regarded as "Vulnerable" according to the National Biodiversity Assessment. However, due to urbanisation, the habitat found along the proposed route consists of a scattered mosaic of grasslands, with very few sections of habitat which are representative of the primary vegetation.

According to the latest Important Bird and Biodiversity Areas (IBBAs) dataset the proposed development footprint does not overlap any IBBAs, nor any formally protected areas and National Protected Areas Expansion Strategy. However, two protected area were identified within 10 kilometres of the site, i.e. the Leeuwkuil Nature Reserve and the Sasol Private Nature Reserve. It was determined that there should be little, to no impact to both nature reserves. The Leeuwkuil Nature Reserve may experience moderate impacts during the operational phase if impacts are not carefully managed.

A preliminary floral assessment was conducted using The South African National Biodiversity Institute's Plants of South Africa database. A total of 60 individual species

were identified along the route and neighbouring areas. The most prominent plant families were as follows:

- Amaranthaceae (Amaranth Family) – 16 species (No Endemics);
- Apocynaceae (Dogbane Family) – 15 species (2 Endemics);
- Asteraceae (Daisy Family) – 42 Species (4 Endemic; 1 Near Threatened Species);
- Cyperaceae (Cyperus Family) – 24 Species (No Endemics);
- Fabaceae (Pea Family) – 31 Species (3 Endemics);
- Hyacinthaceae (Hyacinth Family) – 12 Species (No Endemics); and
- Poaceae (Grass Family) – 44 Species (No Endemics).

One (1) protected plant species was observed and the ELM would have to apply for a permit at least three (3) months before construction commences to remove the species. It was determined that at least 7 individual clumps would be impacted, but which will not directly affect this species at a regional or national level. However, there is a strong likelihood that additional clumps may be found nearby, and a search and rescue process would need to be conducted prior to the commencement of construction on site. This may be used to determine the exact number and location of each clump and to move each specimen to the safe and suitable location nearby.

The Impact Assessment concluded that the activities would have a moderate to low impact on the receiving environment before the implementation of mitigation measures. After the implementation of mitigation measures, it was determined that the impacts will have a very low to low significance. The ecological specialist is therefore of the opinion that the proposed development should proceed provided that the mitigation measures and conditions are implemented.

An Impact Assessment conducted by GIBB Environmental (Pty) Ltd for the proposed upgrade of the Leeuwkuil conveyances identified the following impacts and significance ratings before and after the implementation of mitigation measures:

Impact Category	***Significance before mitigation***	***Significance after mitigation***
Construction Phase		
Loss of vegetation communities	Low negative	Very low negative
Loss of plant species of conservation concern	Low negative	Very low negative
Loss of faunal species of conservation concern	Low negative	Very low negative
Fragmentation, loss of ecosystem function and edge effects	Low negative	Very low negative
Invasion of alien plant species	Moderate negative	Very low negative
Sewage spills and leaks from conveyance systems	Very low negative	Very low negative
Usage and storage of Hydrocarbon products	Very low negative	Very low negative
Usage of on-site sanitation systems	Very low negative	Very low negative
Loss of wetland area/functionality	Low negative	Very low negative
Excavation of trenches	Low negative	Very low negative
Increased local traffic	Very low negative	Very low negative
Construction of storm water systems	Low negative	Very low negative
Construction of temporary roads	Low negative	Very low negative
Increased waste production	Very low negative	Very low negative
Increased erosion and sedimentation	Low negative	Very low negative
Damage or destruction of heritage resources	Very low negative	Very low negative

Damage or destruction of palaeontological resources	Low negative	Very low negative
Operational Phase		
Loss of faunal species of conservation concern	Very low negative	Very low negative
Invasion of alien plant species	Moderate negative	Very low negative
Sewage spill along conveyance system	Low negative	Very low negative
Proper maintenance of sewer infrastructure	Low negative	Very low negative
Alteration of sub-surface flows	Low negative	Very low negative
Increased sanitation services and improved sewage management	High positive	High positive
Employment creation	Low positive	High positive

The Impact Assessment identified that the impacts applicable during the construction and operational phases of the wastewater conveyance system, will be of moderate to very low significance. The Environmental Assessment Practitioner is of the opinion that the impacts to the receiving environment during the construction and operational phases will be of very low significance with the implementation of mitigation measures and conditions as set out in the EMPr.

Without upgrading the Leeuwkuil conveyance system, the system will remain unable to cater for the current and future local and municipal needs. Sewage overflow discharge into the Vaal River will continue (as is currently the case), continuously degrading the watercourse quality and other related user health impacts. The need for upgraded wastewater conveyances in the local area (which is able to cater for the current and future demands) therefore outweighs the potential impacts of the proposed project to the surrounding environment.

GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 2)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**

4. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority (uploaded to the EIA online system) empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**

5. A copy (PDF) of the final report and attachments must be uploaded to the EIA online system in at offices of the relevant competent authority, as detailed below.

6. 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.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**

10. 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 competent authority for assessing the application, it may result in the application for environmental authorisation being refused.

11. The applicant must fill in all relevant sections of this form. Incomplete applications will not be processed. The applicant will be notified of the missing information in the acknowledgement letter that will be sent within 10 days of receipt of the application.

12. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

13. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

14. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
Ground floor, Umnotho House, 56 Eloff Street, Johannesburg
Email Address: bongani.shabangu@gauteng.gov.za

Administrative Unit telephone number: (011) 240 3052/3052
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

An Application for Environmental Authorisation (EA) was submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) on **13/04/2022** with reference **GAUT 002/22-23/E3191** (refer to **Appendix I.1.**).

Is a closure plan applicable for this application and has it been included in this report? **N/A**

if not, state reasons for not including the closure plan.

The proposed development includes the upgrade of conveyances for the existing Leeuwkuil Waste Water Treatment Works (WWTWs). Closure is not envisaged for the proposed development as it will remain in the sewage services infrastructure grid of the Emfuleni Local Municipality (ELM).

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? **YES**

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? **YES**

If no, state reasons for not attaching the list.

A list of all relevant State Departments is included in the Interested and Affected Parties (I&AP) Stakeholder Database. Please refer to **Appendix E.9** of this Draft Basic Assessment Report (BAR).

Have State Departments including the competent authority commented? **NO**

If no, why?

At this stage, Interested and Affected Parties (I&APs) have only been notified of the proposed upgrades and were invited to register as I&AP. GIBB Environmental compiled an I&AP database which includes the details of organs of state that could have an interest in the project.

This report is the Draft Basic Assessment Report (DBAR), which will be made available to the public, stakeholders and relevant organs of state for review and comment. The comments will be considered and addressed in the Final Basic Assessment Report (FBAR) to be submitted to the Competent Authority (CA). A Comments and Response Report (CRR) will be included as part of the FBAR and, where regarded as necessary, the BAR will be amended to specifically address the issues as raised by I&APs.

If the comments supplied require significant additional inputs/significant amendments to the BAR, the DBAR will be amended and will again be made available for I&AP comment before submitting the FBAR.

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

THE PROPOSED UPGRADE OF THE LEEUWKUIL WASTEWATER TREATMENT CONVEYANCES WITHIN THE EMFULENI LOCAL MUNICIPALITY, GAUTENG PROVINCE.

Project Details

GIBB Environmental (Pty) Ltd (GIBB) has been appointed as the independent Environmental Assessment Practitioner (EAP) by GIBB (Pty) Ltd on behalf of the Emfuleni Local Municipality (ELM) to undertake the application process for Environmental Authorisation (EA), subject to a Basic Assessment (BA) process for the Leeuwkuil Wastewater Treatment Conveyances project.

The Applicant, ELM, has identified the need for the Sedibeng Regional Sanitation Scheme (SRSS) project. The SRSS is a project which aims to create bulk sanitation capacity in the Sedibeng region, deliver effective solutions to prevent pollution of water resources and unlock development projects that require sanitation services within the Emfuleni and Midvaal Municipal areas including the Sebokeng, Vanderbijlpark, Vereeniging and Meyerton sewage catchments. The Leeuwkuil Wastewater Treatment Conveyances project forms part of the overall SRSS.

The Leeuwkuil Wastewater Treatment Conveyances project comprises approximately 32 km of sewerage pipeline conveyances that will be upgraded, which in turn will improve sludge management at the Leeuwkuil Waste Water Treatment Works (WWTW) and cater for future planned developments. This project will accommodate sewage flows from the south Sebokeng catchment, Vereeniging catchment and Vanderbijlpark catchment and cater for the future planned development. In addition, the project will allow the integration of the Vereeniging and Vanderbijlpark catchments to create flexibility in the sewerage system for both catchments, and allow for transfer of sewage from Vanderbijlpark catchment to the regional Rietspruit WWTW.

In addition to the above, the project will also include the upgrading and refurbishing of five pumpstations (PS2B, PS3D, PS4B, PS5 and PS10). Most of the pump station within the study area fall within the Vereeniging catchment and have been designed to cater for the project sewage flow. The pumpstation are located here:

- PS2B: 26°40'27.36"S; 27°54'26.72"E
- PS3D: 26°39'7.30"S; 27°55'7.30"E
- PS4B: 26°40'47.94"S; 27°53'11.89"E
- PS5: 26°39'46.32"S; 27°57'27.52"E
- PS10: 26°40'50.26"S; 27°56'9.55"E

The application covers only the sections of pipeline that actually triggers listed activities (i.e. sections of pipeline that are in sensitive environments) in total approximately 3,5 km, and not the entire pipeline route of 32 km.

Refer to **Figure 1** below for a Locality Map of the proposed development, that indicate the entire pipeline route as well as the sections that is subject of this application.

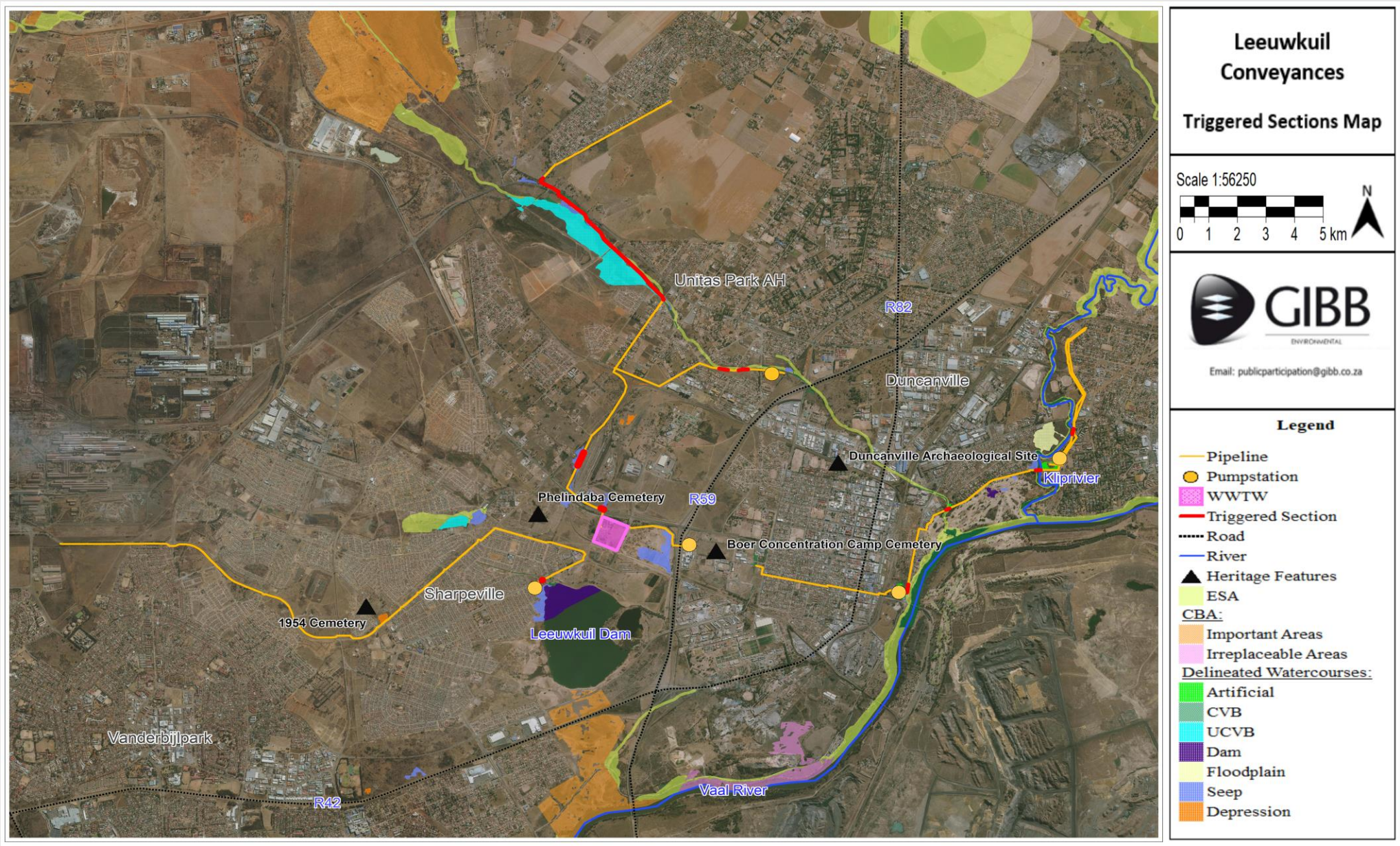

Figure 2: Locality Map of the proposed Leeuwkuil Sewer Line Upgrade

Select the appropriate box

The application is for an upgrade of an existing development	X	The application is for a new development		Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	~~NO~~

If yes, describe the legislation and the Competent Authority administering such legislation

National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA)

Competent Authority: **Gauteng Department of Agriculture and Rural Development (GDARD).**

The upgrade of the proposed Leeuwkuil conveyances will require the excavation and removal of in excess of 10 m^3 of material from watercourses and require the clearance of of vegetation on an area of more than 300 m^2 within Ecological Support Areas. This triggers activities in **Listing Notice 1 (GN R 327)** and **Listing Notice 3 (GN R 324)** of the **Environmental Impact Assessment (EIA) Regulations, 2014 (as amended)** (refer to **Table 1**).

Table 3: Listed activities triggered by the proposed development

No.	Activity number	Activity Description	Applicability
327	***19***	*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;* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.*	The surface water resources which will be affected by the proposed installation of the sewer line, i.e. the Vaal River, Kliprivier and various wetland areas, meets part (b) and (c) of the definition of a watercourse as set out in the EIA Regulations 2014 (as amended). The proposed activity will require the excavation and removal of in excess of 10 m^3 of material from the watercourses, which triggers this listed activity. Since none of the listed exclusions are applicable, this Listed Activity is triggered and requires an Environmental Authorisation (EA) subject to a Basic Assessment (BA) process prior to commencement.
324	***12***	*The clearance of an area of 300 square metres or more of indigenous vegetation except where*	The proposed development will require the clearance of an area of more than 300 m^2 within Ecological

		such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. *c. Gauteng* *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or* *iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.*	Support Areas as identified in the Gauteng Conservation Plan. Since the development is not required for maintenance purposes undertaken in accordance with a maintenance management plan, this Listed Activity is triggered and requires an EA subject to a BA process prior to commencement.

National Water Act, 1998 (Act 36 of 1998) (NWA)

Competent Authority: **Department of Water and Sanitation**

The pipeline development will extend through an identified stream (the Klipriver) and will also be situated within 500 m of a delineated wetland features. As a result, the following water uses in terms of Section 21 of the NWA will be applicable to the project (**Table 2**).

Table 4: Water uses triggered in terms of Section 21 of the National Water Act

No.	Activity Description	Applicability / Relevance
Section 21 of the National Water Act		
c	*impeding or diverting the flow of water in a watercourse*	The Wetland Delineation, Impact Assessment and associated Risk Assessment undertaken for the project confirmed the presence of watercourses and wetlands within 500 m of the development, and that proposed sewer infrastructure will be routed through a watercourse. As such, these water uses under Section 21 of the NWA will apply to the project.
i	*altering the bed, banks, course or characteristics of a watercourse*	

If yes, have you applied for the authorisation(s)?

If yes, have you received approval(s)? (attach in appropriate appendix)

YES	~~NO~~
~~YES~~	**NO**

2. 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:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
The Constitution of the Republic of South Africa	National & Provincial	1996
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended)	National & Provincial	1998
Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice No. R327, R325 and R324, 07 April 2017)	National & Provincial	2017
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	1999
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	National & Provincial	2008
National Water Act, 1998 (Act No. 36 of 1998)	National & Provincial	1998
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	National & Provincial	2004
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	National & Provincial	2003
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	National & Provincial	2004
National Dust Control Regulations, 2013 (Government Notice No. R287, 01 November 2013)	National & Provincial	2013
Occupational Health and Safety Act, 1993 (Act 85 of 1993)	National & Provincial	1993
Guideline on Public Participation	Department of Environmental Affairs (DEA)	2012 and 2017
Guideline On Alternatives	DEA	2011
Guideline on Need and Desirability	DEA	2012 and 2017
Gauteng Environmental Management Framework (EMF)	Provincial	2017
Emfuleni Local Municipality Integrated Development Plan	Municipal	2021-2022
Emfuleni Local Municipality Spatial Development Framework	Municipal	2021-2022

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
The Constitution of the Republic of South Africa	The constitution paved the way for the protection of the natural environment and heritage resources through the recognition of the rights to a safe and healthy environment.
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended)	NEMA is the key environmental management legislation and states in section 2(4) (k) that "the environment is held in public trust for the people, the beneficial use of resources must serve the public interest and the environment must be protected as the people's common heritage" thereby paving the way for EIA process to assess developments that may have a harmful impact on the environment.
Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice No. 327, 325 and 324, 07 April 2017)	The EIA regulations describe the EIA process to be followed including the public participation process, and the listed activities that may have a

	harmful impact on the environment and must be assessed.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Our heritage is unique and precious and it cannot be renewed. It helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has the power to build our nation. It has the potential to affirm our diverse cultures, and in so doing shape our national character. Our heritage celebrates our achievements and contributes to redressing past inequities. It educates, it deepens our understanding of society and encourages us to empathise with the experience of others. It facilitates healing and material and symbolic restitution, and it promotes new and previously neglected research into our rich oral traditions and customs. The present proposed development is a listed activity in terms of Section 38 of the NHRA and as such a HIA was conducted by an independent heritage management consultant.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The National Environmental Management: Waste Act, 2008 (Act No. 58 of 2008) aims to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.
National Water Act, 1998 (Act No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) governs the protection of water resources and use. The preamble to the NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the Nation's water resources in the interests of all water users.
National Environmental Management:	The Biodiversity Act provides for the management

<table>
<tr><td>Biodiversity Act, 2004 (Act No. 10 of 2004)</td><td>and protection of the country's biodiversity within the framework established by NEMA. It provides for the protection of species and ecosystems in need of protection, sustainable use of indigenous biological resources, and equity in bio-prospecting. Critical Biodiversity Areas and Ecological sensitive areas have been identified by the Gauteng C-Plan and GIS mapping.</td></tr>
<tr><td>National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003</td><td>The Protected Areas Act provides for the protection and conservation of ecologically viable areas representative of the country's biological diversity, its natural landscapes and seascapes.</td></tr>
<tr><td>National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)</td><td>The aim of The NEMAQA is to:
Protect and enhance air quality in the Republic;
Prevent air pollution and ecological degradation; and
Secure ecologically sustainable development while promoting justifiable economic and social development.
The NEMAQA makes provision for the establishment of ambient air quality and emission standards at a national, provincial and local level.

Government Notice No. 893 of 2013 lists activities that result in atmospheric emissions, and which have (or may have) a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.

Please note that the proposed upgrades will not trigger any of these listed activities.</td></tr>
<tr><td>National Dust Control Regulations, 2013 (Government Notice No. R287, 01 November 2013)</td><td>The purpose of these regulations is to prescribe general measures for the control of dust in all areas.

The proposed development will generate dust emissions during the construction phase, which must comply with the prescribed dust fall rates:
<table>
<tr><th>Restriction Area</th><th>Dust fall rate (D) (mg/m^2/day, 30-days average)</th><th>Permitted frequency of exceeding dust fall rate</th></tr>
<tr><td>Residential area</td><td>D < 600</td><td>Two within a year, not sequential Months</td></tr>
<tr><td>Non-residential area</td><td>600 < D < 1 200</td><td>Two within a year, not sequential Months</td></tr>
</table>
</td></tr>
</table>

Occupational Health and Safety Act, 1993 (Act 85 of 1993)	• Control of hazardous chemical substances. • Major hazardous installations that may have adverse health and safety effects.
Promotion of Access to Information Act, 2000 (Act 2 of 2000)	The purpose of the Promotion of Access to Information Act (PAIA) is to give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith. For the purpose of the Proposed Development, information has been shared in line with legislative public participation guidelines.
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	The purpose of CARA is to protect agricultural land from degradation. For the purpose of the Leeuwkuil wastewater conveyances, alien invasive species may establish as a result of construction activities, soil erosion may occur, and compaction of soil may result from activities on site. It is imperative that these potential impacts are managed through specific conditions of the EMPr.
Guideline on Need and Desirability, Department of Environmental Affairs (2017)	This guideline contains information on best practice and how to meet the peremptory requirements prescribed by the legislation and sets out both the strategic and statutory context for the consideration of the need and desirability of a development involving any one of the NEMA listed activities. Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030 (NDP). Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line. The need and desirability have taken into consideration all the legislative requirements relating to the Proposed Development.

National Spatial Biodiversity Assessment (NBSA)	The NBSA establishes protection and conservation priority status for terrestrial, inland water, estuarine and marine ecosystems at a 1:250,000 scale nationally and suggested implementation options for priority areas. It provides the national context for development of biodiversity plans at the sub-national and local scale.
Gauteng Environmental Management Framework (GPEMF)	This GPEMF was used to analyse and determine whether the approval of the application for the proposed development will compromise the integrity of the existing environmental management priorities for the area and if so, justify the identified impacts in terms of sustainability considerations.
Sedibeng District Municipality Integrated Development Plan (IDP, 2021/2022)	All efforts have been made to align the current IDP 2021/22 of Sedibeng District and Local Municipalities IDP's to ensure that the National Sustainable Development Goals (SDGs 2030).The Sedibeng IDP identifies that the upgrades of Waste Water plants will contribute immensely in the Sedibeng Regional Sanitation Scheme (SRSS). The upgrade of the Sebokeng and Meyerton plants are in progress with Leeuwkuil to commence in 2019. There are also continual programs led by Rand Water to monitor, identify and deal with WWTW in the Sedibeng Region
Sedibeng Regional Spatial Development Framework (PSDF, 2017 – 2020) (PSDF, 2017 – 2020)	The Emfuleni Spatial Development Framework 2012-2017 (ESDF) provides a regional overview of development trends and desired land use objects within Emfuleni. The ESDF is aligned with the distribution of potable water, collection and conveyances of wastewater and the treatment of waste water. In addition to this, the IDP takes the responsibility for maintenance of sewer systems and all costs associated with all the assets including maintenance, insurance, licensing and running costs.
Emfuleni Local Municipality Spatial Development Framework	The purpose of the municipal Spatial Development Framework (SDF) is to provide a spatial representation of the municipality's vision, providing a tool to integrate all aspects of spatial planning including those of land use planning and service infrastructure. The growth of the greater Sedibeng district, which includes Emfuleni and Johannesburg, is expanding in a Southern direction. These expansions are putting severe pressure on the current municipal services south of Johannesburg. Resulting in the Sedibeng's sewer network increasing inability to serve the current population needs. This also hinders any future urban developments.

	The proposed upgrades to the Leeuwkuil wastewater conveyances are therefore aligned to the municipality's SDF as it will create bulk sanitation capacity in the region, deliver effective solutions to prevent pollution of water resources and unlock development projects that require sanitation services within the Emfuleni and Midvaal Municipal areas including the Sebokeng, Vanderbijlpark, Vereeniging and Meyerton sewage catchments.
Emfuleni Local Municipality Integrated Development Plan	All efforts have been made to align the current IDP 2021/22 of the ELM IDP's to the National Sustainable Development Goals (SDGs 2030). The ELM IDP identifies need to invest more in water and sanitation services within the municipality. Thus the upgrading of the conveyances will be aligned to the municipality's development goals.

3. ALTERNATIVES

Describe the proposal and 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. The determination of whether the 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.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority 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.

Please describe the process followed to reach (decide on) the list of alternatives below

The proposed project is a direct result of the ESDF and the SDF, therefore no site alternatives or alignment can be considered.

Provide a description of the alternatives considered

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
1	Other – Materials	Materials of the sewer pipes have been considered as alternatives. Generally, there are three different types of pipes that could be utilised, viz. concrete, High-Density Polyethylene (HDPE) and Unplasticized Polyvinyl Chloride (uPVC) pipe. Concrete sewer pipes there are robust and competitively priced. Unfortunately, concrete is susceptible to internal corrosion due to H^2S acid attack. HDPE and uPVC pipes are chemically inert and have excellent corrosion resistance, they are easy to handle, robust, ductile and abrasion resistant. Furthermore, HDPE and uPVC pipes have smooth internal surfaces which allow for a greater flow capacity and minimal friction loss. However, HDPE and uPVC pipes are not

		manufactured in large diameters. uPVC pipes are only small diameter pipes and not suited to high pressure pipelines. To overcome these constraints, reinforced concrete pipes with a 3 mm HDPE lining will be utilized for larger diameter pipe sections (i.e. > 750mm Dia.) on this project, which will protect the concrete pipes against internal corrosion. Where smaller pipes are required (i.e. < 750mm Dia., welded HDPE pipes will be utilized. For small diameter pipes, i.e. the temporary sewer pipes from the various ablution facilities on site etc., uPVC sewer pipes will be utilized.
2	Alternative 1	
3	Alternative 2	
	Etc.	

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

Location Alternatives
No site alternatives have been assessed as the project involves the upgrade of the existing Leeuwkuil conveyances system. The proposed upgrade activities will be limited to the existing servitude footprint of the pipelines itself. No further site alternatives will therefore be considered as this will not be feasible.

Route Alternatives
There are no route alternatives due to the nature of the project which involves the upgrading of the existing sewer pipeline infrastructure. The sewer pipelines will follow a descending and gentle slope from the various start points to the where it connects. Thus, the design of the sewer pipelines takes into account the gentle slope of the pipelines that allows gravity to draw the effluence along the pipelines. This will ensure energy efficient system where no additional energy inputs are required for the transfer of sewage as the sewer pipelines will makes use of gravity, which occurs naturally.

Design Alternatives
There are no feasible design and layout alternatives for the proposed sewer pipeline as designs for sewer pipelines follow specific engineering guidelines. Therefore, there are no implementable design alternatives for sewer pipelines. Energy efficiency has been accounted for through the routing of the sewer pipeline of gentle slopes, as stated in the previous paragraph.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	**N/A**
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	

Ha/ m²

or, for linear activities:

	Length of the activity:
Proposed activity	**Approximately 3.5 km**

Alternatives:
Alternative 1 (if any)
Alternative 2 (if any)

m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity	**10 metres**
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	

Ha/m^2

5. SITE ACCESS

Proposal

Does ready access to the site exist, or is access directly from an existing road? **YES** ~~NO~~

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

Describe the type of access road planned:

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 1

Does ready access to the site exist, or is access directly from an existing road? ~~YES~~ ~~NO~~

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

Describe the type of access road planned:

No site alternatives were considered as the footprint of the site remained the same. Only material alternatives were considered.

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2

Does ready access to the site exist, or is access directly from an existing road? ~~YES~~ ~~NO~~

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

Describe the type of access road planned:

No site alternatives were considered as the footprint of the site remained the same. Only material alternatives were considered.

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated **0** Number of times

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

Please refer to **Appendix A** of this Draft BAR to view all the environmental sensitivity maps related to this proposed project.

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);

- A1 size for activities with development footprint of >50 hectares);

- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be 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 locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

7. SITE PHOTOGRAPHS

Please refer to **Appendix B** of this Draft BAR to view the Photograph Plate for this proposed project.

Colour photographs from the center 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 the appropriate Appendix**.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

8. FACILITY ILLUSTRATION

Please refer to **Appendix C** of this Draft BAR to view the illustrations related to this proposed project.

A detailed illustration of the activity must be provided at a scale of 1:200 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 to be attached in the appropriate Appendix.

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route | **1** | times

Instructions for completion of Section B for location/route alternatives

1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alterative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives | **0** | times | (complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route | | (complete only when appropriate for above)

Section B – Location/route Alternative No. | | (complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description:
(Including Physical Address and Farm name, portion etc.)

All of the Leeuwkuil pipelines are located within Vereeniging, Gauteng Province and fall within the urban development boundary. The following properties are affected:

1. Erf 367 of Three Rivers – IQ
2. Portion 39 of farm Klipplaatdrift No. 601 – IQ
3. Portion 2 of farm Klipplaatdrift No. 601 – IQ
4. Portion 221 of farm Houtkop No. 594 – IQ
5. Portion 13 of farm Houtkop No. 594 – IQ
6. Portion 58 of farm Houtkop No. 594 – IQ
7. Portion 152 of farm Houtkop No. 594 – IQ
8. Erf 921 of Unitas Park Ext. 3 – IQ
9. Erf 1332 of Unitas Park Ext. 3 – IQ
10. Portion 23 of farm Houtkop No. 594 – IQ
11. Erf 1204 of Vereeniging Ext. 1 – IQ
12. Erf 1205 of Vereeniging Ext. 1 – IQ
13. Portion 61 of farm Leeuwkuil No. 596 – IQ
14. Erf 8855 of Sharpeville

2. 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 decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:	Latitude (S):	Longitude (E):
	°	°

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
• Starting point of the activity	°	°
• Middle point of the activity	°	°
• End point of the activity	°	°

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached **NO**

The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	
ERF NAME	**SG CODE**
Erf 367 of Three Rivers – IQ	T0IQ04040000036700000
Portion 39 of farm Klipplaatdrift No. 601 – IQ	T0IQ00000000060100039
Portion 2 of farm Klipplaatdrift No. 601 – IQ	T0IQ00000000060100002
Portion 221 of farm Houtkop No. 594 – IQ	T0IQ00000000059400221
Portion 13 of farm Houtkop No. 594 – IQ	T0IQ00000000059400013
Portion 58 of farm Houtkop No. 594 – IQ	T0IQ00000000059400058
Portion 152 of farm Houtkop No. 594 – IQ	T0IQ00000000059400152
Erf 921 of Unitas Park Ext. 3 – IQ	T0IQ04130000092100000
Erf 1332 of Unitas Park Ext. 3 – IQ	T0IQ04130000133200000
Portion 23 of farm Houtkop No. 594 – IQ	T0IQ00000000059400023
Erf 1204 of Vereeniging Ext. 1 – IQ	T0IQ04510000120400000
Erf 1205 of Vereeniging Ext. 1 – IQ	T0IQ04510000120500000
Portion 61 of farm Leeuwkuil No. 596 – IQ	T0IQ00000000059600061
Erf 8855 of Sharpeville	T0IQ05370000885500000

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

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~~

4. LOCATION IN LANDSCAPE

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

~~Ridgeline~~	~~**Plateau**~~	~~Side slope of hill/ridge~~	~~Valley~~	~~Plain~~	Undulating plain/low hills	River front

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

a) Is the site located on any of the following?

Shallow water table (less than 1.5m deep)	~~YES~~	**NO**
Dolomite, sinkhole or doline areas	**YES**	~~NO~~
Seasonally wet soils (often close to water bodies)	~~YES~~	**NO**

Unstable rocky slopes or steep slopes with loose soil	~~YES~~	**NO**
Dispersive soils (soils that dissolve in water)	~~YES~~	**NO**
Soils with high clay content (clay fraction more than 40%)	~~YES~~	**NO**
Any other unstable soil or geological feature	~~YES~~	**NO**
An area sensitive to erosion	~~YES~~	**NO**

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s) ~~YES~~ **NO**

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

c) are any caves located within a 300m radius of the site(s) ~~YES~~ **NO**

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

d) are any sinkholes located within a 300m radius of the site(s) ~~YES~~ **NO**

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)? ~~YES~~ **NO**

Please note: The Department may request specialist input/studies in respect of the above.

7. GROUNDCOVER

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

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition % = 4	Natural veld with scattered aliens % = 16	Natural veld with heavy alien infestation % = 7	Veld dominated by alien species % = 20	Landscaped (vegetation) % = 2
Sport field % = 0	Cultivated land % = 0	Paved surface (hard landscaping) % = 22	Building or other structure % = 0	Bare soil % = 29

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site ~~YES~~ **NO**

If YES, specify and explain:

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site. ~~YES~~ **NO**

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on the site? **YES** ~~NO~~

If YES, specify and explain:

Yes. Ecological Support Areas (ESAs), wetlands and rivers.

Was a specialist consulted to assist with completing this section			**YES**	~~NO~~
If yes complete specialist details				
Name of the specialist:	Bryan Paul			
Qualification(s) of the specialist:	SACNASP / B.Sc. Honours Environmental Management / B.Sc. Zoology & Botany			
Postal address:	236 Ninth Avenue, Morningside, DURBAN			
Postal code:	4001			
Telephone:	+27 (0)31 303 2835	Cell:	+27 (0)72 528 5956	
E-mail:	bryan@afzelia.co.za	Fax:	-	
Are any further specialist studies recommended by the specialist?			~~YES~~	**NO**
If YES, specify:	-			
If YES, is such a report(s) attached?			~~YES~~	~~NO~~
If YES list the specialist reports attached below				
-				

Signature of specialist:  Date: 13/07/2022

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	25. Major road (4 lanes or more)[N]
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	
Other land uses (describe):	35. Artificial watercourse 36. Pumpstation			

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

The land use characteristics below only show sections of the pipeline that has been triggered. Triggered pipeline sections are numbered as shown in the Figure below:

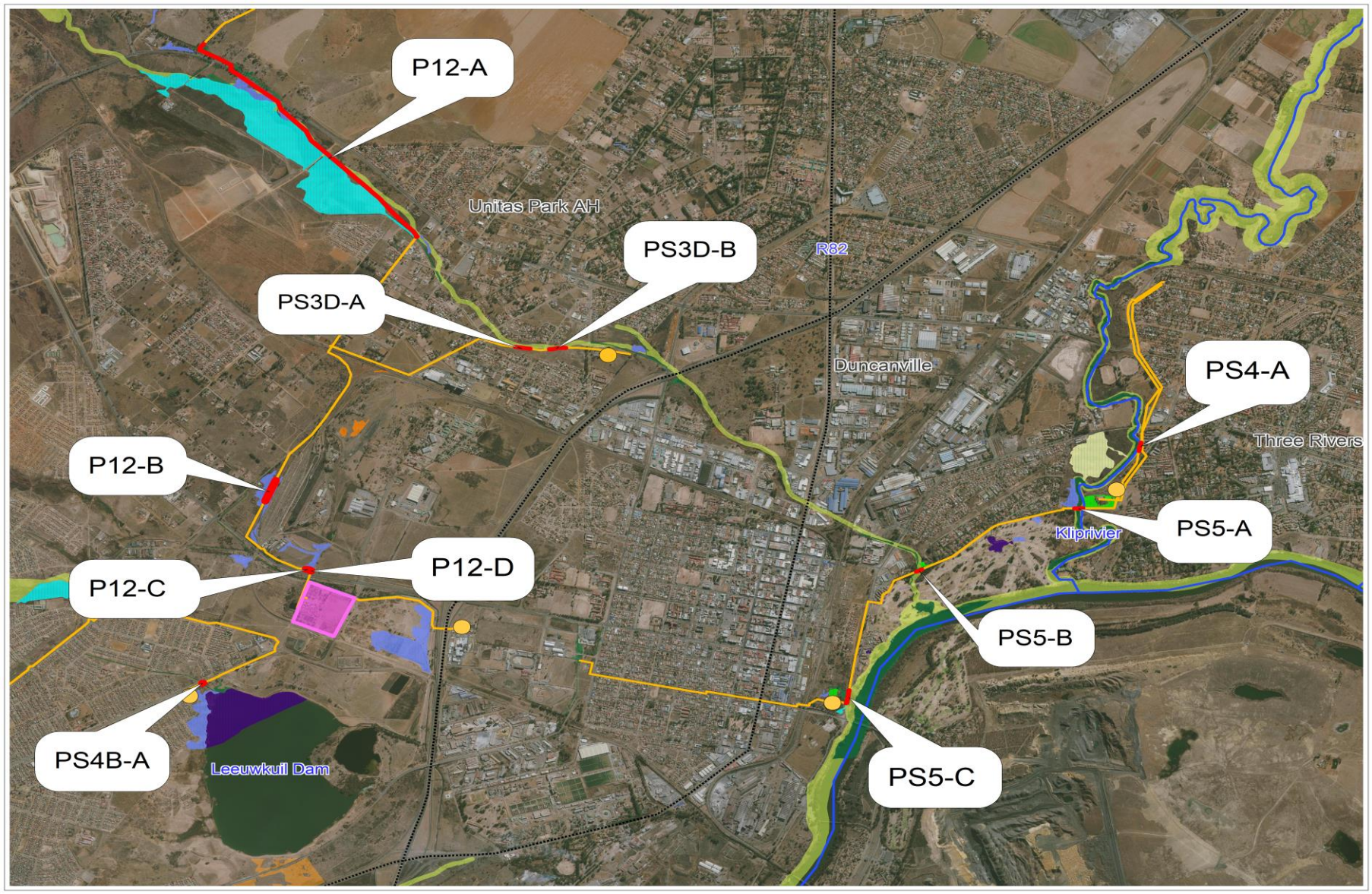

Figure 3: Triggered Pipeline Sections

Pipeline PS4-A:

NORTH

	2	9	9	
1	2	9	9	9
1	2		9	9
1	2	1	9	9
	2	1	1	

WEST EAST

SOUTH

Pipeline PS5-A:

NORTH

	1	2	1	
9	1	2	1	1
1	1		1	1
21	1	2	1	1
	1	2	1	

WEST EAST

SOUTH

Pipeline PS5-B:

NORTH

	1	2	1	
14	1	2	6	1
14	1		21	21
21	2, 21	2, 21	21	21
	21	21	21	

WEST EAST

SOUTH

Pipeline PS5-C:

NORTH

	1	1	17	
1	1	1	17	2
35	2		20	2
1	36	2	20	2
	1	1	20	

WEST EAST

SOUTH

Pipeline P12-A:

NORTH

1	**1**	**1**											
1	**1**	**1**	**1**										
1,2	**1,2**		**1**	**1**									
	1,2	**1,2**		**1**	**1**								
		1,2	**1,2**		**1**	**1**							
			1,2	**1,2**		**1**	**1**						
				1,2	**1,2**		**1**	**1**					
					1,2	**1,2**		**1**	**1**				
						1,2	**1,2**		**1**	**1**			
							1,2	**1,2**		**1**	**1**		
								1,2	**1,2**		**1**	**1**	
									1,2	**1,2**		**1,2**	**1,2**
										1,2	**1,2**	**1,2**	**1,2**
											1,2	**1,2**	**1,2**

WEST EAST

SOUTH

Pipeline P12-B:

NORTH

	8	**1**	**23**	
8	**8**	**1**	**23**	**23**
8	**8**		**23**	**23**
8	**8**	**1**	**23**	**23**
	8	**1**	**23**	

WEST EAST

SOUTH

Pipeline P12-C/D:

NORTH

	1	**1**	**1**	
1	**1**	**1**	**1**	**1**
1	**1**		**1**	**1**
1	**1**	**1**	**1**	**1**
	1	**1**	**26**	

WEST EAST

SOUTH

Pipeline PS3D-A:

NORTH

		9	9	9	9	9	
		1	1	1	1	1	
WEST	2	2				2	2	EAST
		1	1	1	1	1	
		9	9	9	9	9	

SOUTH

Pipeline PS3D-B:

NORTH

		9	9	9	1	1	
		1	1	1	1	1	
WEST	2	2				2	2	EAST
		1	1	1	1	1	
		9	9	9	9	9	

SOUTH

Pipeline PS4B-A:

NORTH

		10	10	10		
	10	10	10	10	10	
WEST	10	1		36	1	EAST
	10	1	1	1	1	
		1	6	6		

SOUTH

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached	**YES**	~~NO~~

If yes indicate the type of reports below

The following specialist reports have been attached to **Appendix G** of this DBAR:

1. Groundwater Impact Assessment by SRK Consulting (South Africa) Pty Ltd;
2. Heritage Impact Assessment by Beyond Heritage (Pty) Ltd;
3. Paleontological Impact Assessment by Prof Marion Bamford (University of the Witwatersrand);
4. Wetland Assessment Report by EP3 Environmental (Pty) Ltd;
5. Ecological Impact Assessment by Afzelia Environmental Consultants (Pty) Ltd.

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The following section provides information on the population, the economic profile, the level of employment and service delivery for the Emfuleni Local Municipality (ELM) as provided by the 2016 Community Survey conducted by Statistics South Africa (if not stated otherwise).

Population

The ELM is one of the three local municipalities comprising the Sedibeng District Municipality (SDM). EML is a Category B Municipality situated in the Sedibeng District in the Gauteng Province. It is the westernmost Local Municipality of the district, which covers 987, 45 km^2 southern area of the Gauteng Province (Emfuleni Local Municipality, 2010). The ELM consists of a total population of 733 445 and showed a 1.6% increase from the total population in 2011 (721 6643). Of the population, 85.3% are black African, 12.4% are white, 1.3% are coloured, and 1.0% are Indian/Asian.

Economic Profile

The ELM has two main city centers, Vereeniging and Vanderbijlpark, and is strategically located with the N1 national route traversing the municipality (ELM, 2010). The area was also once renowned for its contribution to the iron and steel industry in South Africa and formed the "heartland" of what was formerly known as the Vaal Triangle. Th ELM contains six large former peri-urban townships of Evaton, Boipatong, Bophelong, Sebokeng, Sharpeville and Tshepiso (ELM, 2010).

Level of Education

In 2016, approximately 73.6% (about 184 386 individuals) of the population aged between 5 and 24 attended an educational institution. The ELM has the highest percentage of persons with secondary schooling (approximately 78% in 2016) in comparison with the national average (approximately 43.7%), Gauteng Province (approximately 75.9%), and City of Johannesburg (approximately 76.1%) and Sedibeng (approximately 77.4%) Municipalities in 2016. The percentage of persons (20 years or older) with no schooling or with some primary schooling was estimated at 15.3% in 2016.

Level of Unemployment

The ELM is facing high levels of unemployment, worsening inequality and abject poverty, consistent with the country's state of affairs. In 2011, 205 543 people were economically active i.e. employed or unemployed but looking for work. About 34.7% of the economically active people were unemployed. With regards to the youth of ELM, around 85 594 were economically active with 45% being unemployed.

The formal sector contributes the largest share to total employment in ELM, compared to the informal sector. The manufacturing, finance and business as well as government industries are the largest contributors to employment in the municipality, contributing approximately 26.2%, 22.4%

and 21.8% in 2016, respectively. On the contrary, mining and quarrying as well as agriculture, forestry and fishing are the least employment contributors, contributing 1% and 0.7% in 2016, respectively.

Service Delivery

Household Dwelling Type

Most of the households in the ELM occupy formal dwellings. In 2016, 87% were formal dwellings, while 12.3% are informal and 0.6% are classified as traditional and other dwelling units. Error! Reference source not found. shows the proportion of household dwellings in the ELM, estimated in 2016.

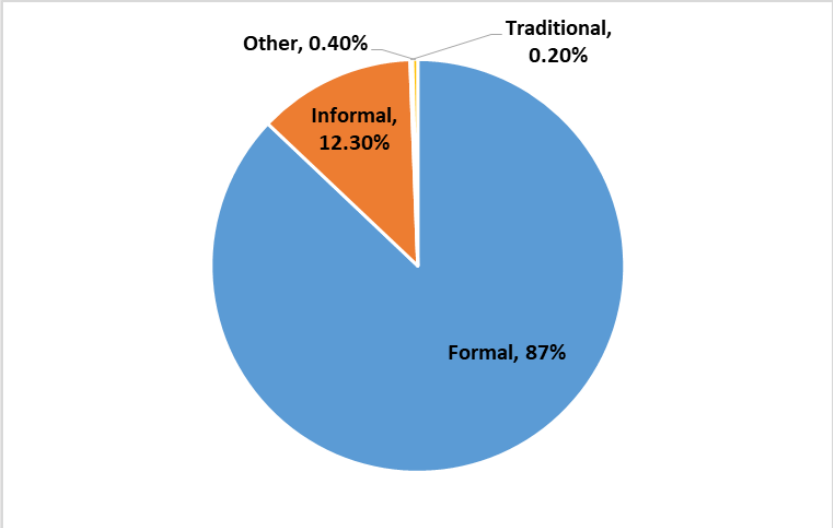

Figure 4: Proportion of household dwelling units in ELM (adopted from StatsSA, 2016)

Water and Sanitation

Most households in the ELM have access to piped water inside dwelling/house (73.3% in 2016) or yard (22.2% in 2016), however, 4.3% of the population either shares communal pipe water or does not have formal piped water accessible to their household.

Most households (93.3%) in the ELM have flush toilets, while 4.3% have access to pit toilets, 0.3% make us of chemical toilets, 0.7% use ecological toilets and 1.4% use a bucket system or do not have toilet facilities (refer to Error! Reference source not found. below). The percentage of households with access to safe drinking water stood at 94.9% in 2016 which is 2% higher compared to the Provincial average of 92.9% but lower than the percentage of Sedibeng (95%).

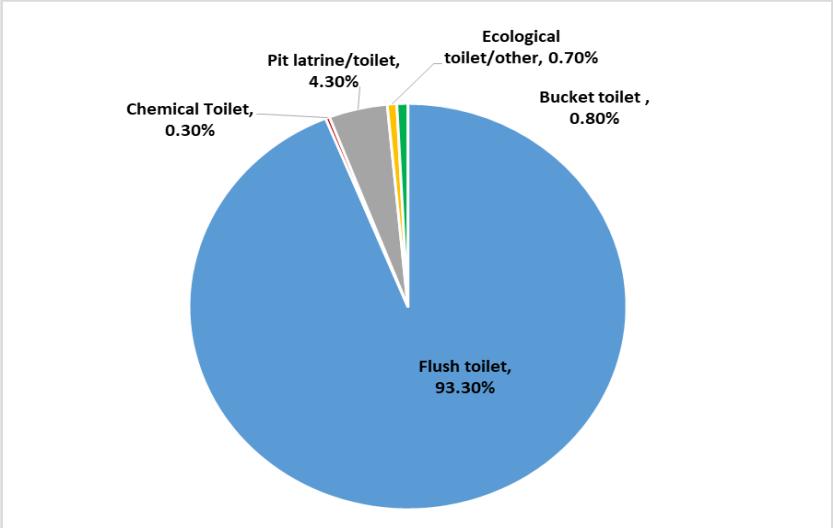

Figure 5: Households by type of toilet facility in ELM (adopted from StatsSA, 2016)

Metsi-a-Lekoa, the water unit of ELM is responsible for the distribution of potable water, collection and conveyance of wastewater and the treatment of waste water. In addition to these functions, the unit also takes the responsibility for the maintenance of the water services systems and all costs associated with all the assets including maintenance, insurance, licensing and running costs (ELM, 2010).

Electricity

Electrification provides a solid basis for development of local communities. Once a community has access to electricity, it can also have access to safe potable water, food security, as well as lighting. In addition, it reduces the need for collecting and using other traditional sources of energy. Access to electricity is critical for improving living standards and is indispensable for eradicating poverty and achieving the Sustainable Development Goals.

Most households (about 4 175 597) in Gauteng receive electricity through prepaid meters from either the Municipality or Eskom. The ELM is the same as 138 327 household have Eskom prepaid meters while 76 360 households us prepaid municipality meters.

Refer to Error! Reference source not found. below for the distribution of households by electricity supplier.

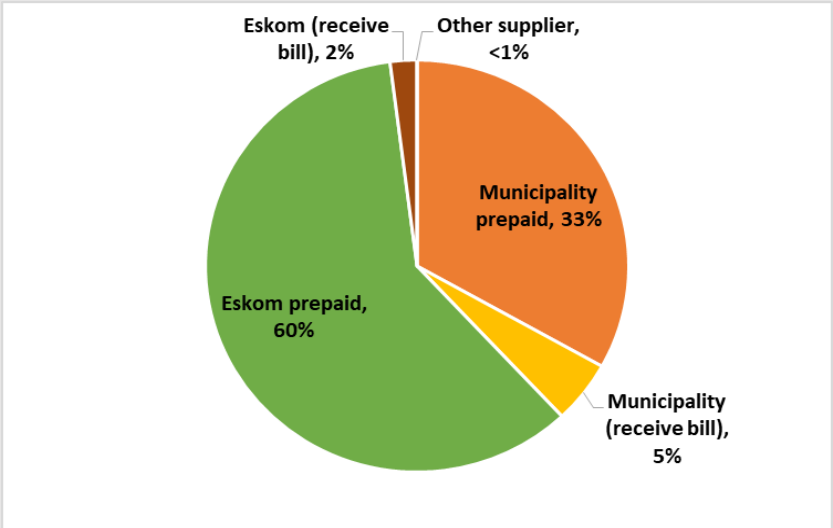

Figure 6: Distribution of households by supplier of electricity (adopted from StatsSA, 2016)

Waste Management – Refuse Removal

Refuse removal services are essential for the provision of basic human services and the protection of the environment. The inability to provide these services may lead to illegal dumping, environmental degradation and potentially result in health-related issues.

Refuse removal is categorised as formal (refuse removed by the local authority) or informal (where the household or community disposes of waste, or where there is no refuse removal method/service at all) refuse removal services. In 2016, the percentage of households in Emfuleni with access to refuse removal service by the ELM on a weekly basis was 88.1%, the percentage of households with access to refuse removal service by the ELM for less often than weekly was 2.3%, the percentage of households with access to refuse removal service by either a communal dump or central collection point was 1.9%, the percentage of households utilising personal refuse removal efforts (own dump) was 4.8% and the percentage of households with no access or use other refuse removal services was 2.8%.

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site-

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) 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?	~~Yes~~	**NO**

If YES, explain:

N/A

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

Study Area

The project area is located in Vereeniging and falls under the jurisdiction of the Emfuleni Local Municipality within the Gauteng Province (See **Appendix A** for Site Plans). The archaeological record of the project area comprises of the Stone Age, Iron Age and Historical period

The Leeuwkuil conveyances upgrades are all located on estates, lodges, small holdings/ properties, existing construction sites, housing developments and open fields within the suburbs of Sharpeville, Duncanville, Acorn Park, Richmond and Three Rivers. The open fields

between these suburbs have been altered due to informal squatter camps and illegal dumping. The overall landscape is therefore heavily altered no natural or historical environments exist within the various estates along the Vaal River, suburbs, townships and industrial areas. The proposed development site was previously established through consideration of biophysical, social, technical, and cultural aspects. The following section presents results of the Paleontological and Heritage survey conducted within the proposed development site.

Palaeontological Sites

A desktop Palaeontological Impact Assessment was undertaken by Professor Marion Bamford from the University of the Witwatersrand during the month of June 2022. The desktop assessment indicated that the proposed project area lies within Quaternary sands and alluvium to the west and within the Vryheid Formation (Ecca Group and Karoo Supergroup) to the east. The quaternary sands and alluvium are regarded as moderately sensitive whereas the Vryheid Formations is regarded as highly sensitive. It is, however, extremely unlikely that any fossils are preserved in the Quaternary sands and alluvium. Fossils may be found within the Vryheid Formation and consequently a Fossil Chance Find Protocol has been added to the Environmental Management Programme (EMPr). The overall impact on palaeontological resources was determined to very low to low and no further palaeontological impact assessment is required (unless fossils are found during the construction period).

Heritage Sites

A Heritage Impact Assessment was undertaken by Beyond Heritage (Pty) Ltd, and a site visit was conducted on 10 June 2022 in order to survey the proposed project area. Although the Vanderbijlpark area is known for its historical events such as the discovery of the new coal fields, the expanding steel production and the struggle against Apartheid, the impact on heritage resources was determined to be very low. The proposed project is located along the existing sewerage pipelines which is highly disturbed and is also therefore considered to be of low heritage potential. However, during the site visit the following observation were recorded:

1. Cemetery 1954
    - A cemetery (in a small open filed) dating back to 1954 is situated in Mareka Street, Sharpeville, Vereeniging but is currently occupied by informal squatter camps, illegal dumping and grazing animals. The graves are situated approximately 309 m from the proposed conveyances and will therefore not be impacted upon by the upgrade.
2. Phelindaba Cemetery
    - The Phelindaba Cemetery (also referred to as the Sharpeville Massacre victims Grave Sites) is located in Theunis Kruger Street in Vereeniging and was declared as a National Heritage site by SAHRIS in 2016. The cemetery is however surrounded by formal concrete palisade fencing and is more than 30 m from the proposed conveyance upgrade. The Phelindaba Cemetery will therefore not be impacted upon.
3. Boer Concentration Camp Cemetery
    - A Boer Concentration Camp Cemetery was observed in Nic Botha Street, Three Rivers in Vereeniging. As with the Phelindaba Cemetery, this Cemetery is formally fenced and secured and is situated more than 30 m from the proposed conveyance upgrade and will not be impacted upon.
4. Duncanville Archaeological Site
    - The Duncanville Archaeological Site in situated in the wider study area and away from the proposed project area. This Archaeological Site was declared a Provincial Heritage Site by SAHRIS in 1944.

Chance Heritage finds

The studies did not find any permanent barriers or fatal flaws to the proposed development. The following recommendations are based on the results of the PIA and HIA research, cultural heritage background review, site inspection and assessment of significance. All the potential impacts associated with the development site can be mitigated without serious design alterations. The project may be approved subject to the following recommendations:

- Implementation of a Chance Find Procedure;
- The study area should be monitored by and Environmental Control Officer (ECO) during the construction phase of the proposed project; and
- The three recorded cemeteries (i.e. the Cemetery dating back to 1954, the Phelindaba Cemetery, and the Boer Concentration Camp Cemetery) must be indicated on the development plans with a 30 m buffer zone.

The literature review and field research confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with vast local history. In terms of the archaeology and heritage significance for the study area, it is important to note that no 'Fatal Flaws' or 'No-Go' areas have been identified. No archaeological sites were recorded within the development site. The field survey established that the affected project area is degraded by the existing Leeuwkuil wastewater treatment infrastructure, landscaping, previous agriculture activities and associated infrastructure.

This report concludes that the proposed development may be approved by SAHRA to proceed as planned subject to recommendations herein made which include a heritage management plan being incorporated into the construction EMP. The measures are informed by the results of the study and principles of heritage management enshrined in the NHRA.

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

Comments (if applicable) from SAHRA will be added to the Final BAR.

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

2. LOCAL AUTHORITY PARTICIPATION

Local 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. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	**YES**	~~NO~~
If yes, has any comments been received from the local authority?	~~YES~~	**NO**

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

Public Participation to date

The following Public Participation activities have taken place during the announcement of the Project:

- An advertisement announcing the project and the need for an EA was published in the **Northern Ster** on **Tuesday, 19 April 2022**;
- Site notices were erected at six (6) conspicuous places along or in proximity to the proposed new sewer pipeline route on **Friday, 22 April 2022**, as follows (**Table 3**):

Table 5: Site notice locations

NO.	LOCATION	LATITUDE	LONGITUDE
Poster 1	Corner of Houtkop Road and Heine Miller Street, Unitas Park	26°38'27.22"S	27°54'19.08"E
Poster 2	Corner of Alexander Street and Montgomery Street, Unitas Park	26°39'11.16"S	27°54'45.79"E
Poster 3	Corner of Golf Street and Dee Drive, Three Rivers	26°39'52.45"S	27°57'27.85"E)
Poster 4	Corner of Gold Street and Howard Reid Street, Three Rivers	26°40'8.16"S	27°56'38.46"E
Poster 5	Along Mario Milani Drive, Three Rivers	26°40'46.85"S	27°56'14.30"E
Poster 6	In front of Leeuwkuil WWTWs in Lager Street, Vereeniging	26°40'20.28"S	27°53'56.48"E

- Notification Letters announcing the project were sent to Interested and Affected Parties (I&APs) on **Monday, 25 April 2022**.

Proposed Public Participation

The Draft Basic Assessment Report (DBAR) will be made available for public review for a period of 30 calendar days, **Wednesday, 31 August 2022** to **Friday, 30 September 2022 (inclusive)**. During this time the public, I&APs, State Departments, and the Commenting and Competent Authorities will be given the opportunity to review the information and provide comments on the Draft BAR for the proposed Leeuwkuil conveyance upgrades. The Draft BAR will be made available for review and comment on the GIBB website at the following link: https://gibbenvironmental.co.za/category/projects/.

All registered I&APs will be sent notification letters via email, together with a link for the report on the GIBB website. A CD copy will also be available upon request.

I&APs will be invited to submit all comments on the Draft BAR to the Public Participation Office by no later than Friday, 30 September 2022.

GIBB Public Participation Office Contact Details
Attention: Lise Ferreira
Email: publicparticipation@gibbenvironmental.co.za
Post: 147 Bram Fischer Drive, Ferndale, Randburg

All comments made on the Draft BAR during public review will be captured and adequately responded to in the Comments and Response Report (CRR). Once the BAR has been finalised, the CRR together with the Final BAR it will be submitted to the GDARD for decision making.

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

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

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

If "NO" briefly explain why no comments have been received

The Draft BAR will be made available for public review on the GIBB website for a period of 30 days calendar days. During this time the public, I&APs, State Departments, and the Commenting and Competent Authorities will be given the opportunity to review the information and provide comments on the Draft BAR for the proposed Leeuwkuil conveyances. All comments made on the Draft BAR during public review will be captured and adequately responded to in the Comments and Response Report (CRR). Once the BAR has been finalised, the CRR together with the final BAR it will be submitted to the GDARD for decision making.

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process 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 and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed

may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued as required in terms of the regulations

Appendix 3 – Proof of newspaper advertisements

Appendix 4 –Communications to and from interested and affected parties

Appendix 5 – Minutes of any public and/or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA Report

Appendix 9 – Copy of the register of I&APs

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives **0** times (complete only when appropriate)

Section D Alternative No. **0** (complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase? **YES** ~~NO~~

If yes, what estimated quantity will be produced per month? **80 m³**

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

The following solid waste management practices will be implemented during the construction phase.

- Skip bins will be made available on site. Waste separation will be required. Skips will be emptied weekly, with waste disposed of at an appropriate licensed waste disposal facility.
- Only certified portable toilets will be made available on site and will be emptied weekly. Wastes will be transported to a licensed facility for treatment and disposal.
- The camp site will consist of the site office which will include the eating area. Waste will be disposed in the skip bins mentioned above.
- Surplus excavated material will be used as backfilling at identified landfill sites.

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

All construction-related solid waste will be collected from the construction site by a registered service provider and will be disposed of at an appropriate (general or hazardous) registered landfill site.

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

If yes, what estimated quantity will be produced per month? ~~m³~~

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

N/A

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity? ~~YES~~ **NO**

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

N/A

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

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	~~YES~~	**NO**
If yes, inform the competent authority and request a change to an application for scoping and EIA.		
Is the activity that is being applied for a solid waste handling or treatment facility?	~~YES~~	**NO**
If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.		

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

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	**NO**
If yes, what estimated quantity will be produced per month?	~~m^3~~	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	~~YES~~	**NO**
Will the activity produce any effluent that will be treated and/or disposed of on site?	~~YES~~	**NO**
If yes, what estimated quantity will be produced per month?	~~m^3~~	

If yes describe the nature of the effluent and how it will be disposed.

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

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

If yes, provide the particulars of the facility:

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

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

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?	**YES**	~~NO~~
If yes, what estimated quantity will be produced per month?	Temporary chemical toilets will produce approximately 5m^3 of domestic effluent during the construction phase and will be disposed of in the system.	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	~~YES~~	**NO**
Will the activity produce any effluent that will be treated and/or disposed of on site?	~~YES~~	**NO**

If yes describe how it will be treated and disposed off.

Emissions into the atmosphere

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

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

The proposed development will involve the installation of a sewer pipeline which will be situated underground and is, therefore, not expected to exceed the National Ambient Air Quality Standards (GN 1210, December 2009) in terms of section 9(1) of the National Environmental Management Air Quality Act, 2004 (Act No 39 of 2004) (NEMAQA). During the construction phase, dust emissions should not exceed the acceptable dust fall rates (Section 3 of the National Dust Control Regulations (GNR 827) of the NEMAQA) for residential areas (refer to below table).

Restriction Areas	Dust fall rate (D) ($mg/m^2/day$, 30 days average)	Permitted frequency of exceeding dust fall rate
Residential area	D < 600	Two within a year, not sequential months
Non-residential area	600 < D < 1200	Two within a year, not sequential months

2. WATER USE

Indicate the source(s) of water that will be used for the activity

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

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: ~~liters~~

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs? **YES** ~~NO~~

If yes, list the permits required

A Water Use License in terms of Section 21(c) and (i) of the NWA is currently in the process of being applied for.

If yes, have you applied for the water use permit(s)? **YES** ~~NO~~

If yes, have you received approval(s)? (attached in appropriate appendix) ~~YES~~ **NO**

3. POWER SUPPLY

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

Municipality.

If power supply is not available, where will power be sourced from?

Generators.

4. ENERGY EFFICIENCY

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

The proposed route conveyances have been identified as the most optimal route due to the fact that they are gravity fed and pumped. For this reason, there will not be a need for energy inputs for the transfer of sewage as the sewer pipeline will makes use of gravity, ensuring an energy efficient system.

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

The pumped rising mains designs have been optimised to use more gravity designs, and therefore reduced the current number of pump stations. The use of solar power to power some of the equipment on the sites will also be maximised wherever possible. Energy efficient motors and equipment are specified for the power consuming machinery and equipment.

SECTION E: 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 as well as the impacts of not implementing the activity (Section 24(4)(b)(i).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

On 27 April 2022, GIBB Environmental (Pty) Ltd received email correspondence from Mr Mike Moeketsi requesting information regarding GIBB. No issues raised.

On 13 May 2022, GIBB Environmental (Pty) Ltd received email correspondence from Ms Lisa Smith from Unitas Memorial Park. The correspondence related to stand 921 Unitas Park and the Remainder of Portion 13, Houtkop Road, Unitas Park in Vereeniging. Ms Smit requested a detailed diagram of where the pipelines will be installed as they have concern regarding affected traffic flow and the impact that this will have on funerals being held on a daily basis at the cemetery.

The full Comments and Response Report (CRR) is attached to **Appendix E.6** of this DBAR.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Mr Mike Moeketsi was added to the interested and affected parties database in order to receive more information about the project going forward.

Ms Lisa Smith from Unitas Memorial Park was informed by GIBB Environmental (Pty) Ltd that the section of sewer pipeline between Sonlandpark and Unitaspark has been excluded from our scope of works as the Water Use License (WUL) has been obtained and the Environmental Authorisation (EA) process is also in progress. Furthermore, Ms Smit was informed that the Environmental Assessment Practitioner responsible for the WUL and EA is Tsepo Lepono from Ecosolve Consulting. Ms Lisa Smith was also added to the interested and affected parties database in order to receive more information about the project going forward.

The full Comments and Response Report (CRR) is attached to **Appendix E.6** of this DBAR.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

IMPACT ASSESSMENT METHODOLOGY

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed development.

For each of the main project phases the existing and potential future impacts and benefits (associated only with the proposed development) were described using the criteria listed in Error! Reference source not found.**4** below. This was done in accordance with Government Notice R.326, promulgated in terms of Section 24 of the NEMA and the criteria drawn from the IEM Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by

the DEAT (April 1998). The assignment of ratings (see Error! Reference source not found.**5** for assessment rating scales) has been undertaken based on experience of the EIA team, as well as through research. Subsequently, mitigation measures have been identified and considered for each impact and the assessment repeated in order to determine the significance of the residual impacts (the impact remaining after the mitigation measure has been implemented).

Table 6: The criteria and rating scales which were used in the assessment of the potential impacts

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the effect of the impact related to the Development.
	Negative	
Extent	Footprint	The impact only affects the area in which the proposed activity will occur.
	Site	The impact will affect only the development area.
	Local	The impact affects the development area and adjacent properties.
	Regional	The effect of the impact extends beyond municipal boundaries.
	National	The effect of the impact extends beyond more than 2 regional/ provincial boundaries.
	International	The effect of the impact extends beyond country borders.
Duration	Temporary	The duration of the activity associated with the impact will last 0-6 months.
	Short term	The duration of the activity associated with the impact will last 6-18 months.
	Medium term	The duration of the activity associated with the impact will last 18 months-5 years.
	Long term	The duration of the activity associated with the impact will last more than 5 years.
Severity	High negative	The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.
	Moderate negative	The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected
	Low negative	The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected
	Low positive	The severity of the impact is rated as Low positive as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally improved
	Moderate	The severity of the impact is rated as Moderate

	positive	positive as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are positively affected
	High positive	The severity of the impact is rated as High positive as the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.
Potential for impact on irreplaceable resources	No	No irreplaceable resources will be impacted.
	Yes	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental	A combination of extent, duration, intensity and the potential for impact on irreplaceable resources.
	Highly detrimental	
	Moderately detrimental	
	Slightly detrimental	
	Negligible	
	Slightly beneficial	
	Moderately beneficial	
	Highly beneficial	
	Extremely beneficial	
Probability (the likelihood of the impact occurring)	Unlikely	It is highly unlikely or less than 50 % likely that an impact will occur.
	Likely	It is between 50 and 75 % certain that the impact will occur.
	Definite	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance	Very high - negative	A function of Consequence and Probability.
	High - negative	
	Moderate - negative	
	Low - negative	
	Very low	
	Low - positive	
	Moderate - positive	
	High - positive	
	Very high - positive	

Table 7: Impact criteria and rating scales

Duration		Extent		Irreplaceable Resources		Severity		Consequence = (Duration+Extent+Irr) x Severity		Likelihood		Significance = Consequence * Likelihood		Confidence
1	Temporary	**1**	Footprint	**1**	Yes	**-3**	High - negative	**-25 to -33**	Extremely detrimental	**1**	Unlikely	**-73 to -99**	Very high - negative	Low
2	Short term	**2**	Site	**0**	No	**-2**	Moderate - negative	**-19 to -24**	Highly detrimental	**2**	Likely	**-55 to -72**	High - negative	Medium
3	Medium term	**3**	Local			**-1**	Low - negative	**-13 to -18**	Moderately detrimental	**3**	Definite	**-37 to -54**	Moderate - negative	High
4	Long term	**4**	Regional			**0**	Negligible	**-7 to -12**	Slightly detrimental			**-19 to -36**	Low - negative	
		5	National			**1**	Low -positive	**0 to -6**	Negligible			**0 to -18**	Very low - negative	
		6	International			**2**	Moderate - positive							
						3	High - positive	**0 to 6**	Negligible			**0 to 18**	Very Low - positive	
								7 to 12	Slightly beneficial			**19 to 36**	Low - positive	
								13 to 18	Moderately beneficial			**37 to 54**	Moderate - positive	
								19 to 24	Highly beneficial			**55 to 72**	High - positive	
								25 to 33	Extremely beneficial			**73 to 99**	Very high - positive	

Ascribing Significance for Decision-Making

The best way of expressing the environmental costs/impacts and the inherent benefit implications for decision-making is to present them as risks. Risk is defined as the consequence (implication) of an event multiplied by the probability (likelihood)[1] of that event. Many risks are accepted or tolerated on a daily basis because even if the consequence of the event is serious, the likelihood that the event will occur is low. A practical example is the consequence of a parachute not opening, is potentially death but the likelihood of such an event happening is so low that parachutists are prepared to take that risk and hurl themselves out of an airplane. The risk is low because the likelihood of the consequence is low even if the consequence is potentially severe.

It is also necessary to distinguish between the event itself (as the cause) and the consequence. Again, using the parachute example, the consequence of concern in the event that the parachute does not open is serious injury or death, but it does not necessarily follow that if a parachute does not open that the parachutist will die.

Various contingencies are provided to minimise the likelihood of the consequence (serious injury or death) in the event of the parachute not opening, such as a reserve parachute. In risk terms this means distinguishing between the inherent risk (the risk that a parachutist will die if the parachute does not open) and the residual risk (the risk that the parachutist will die if the parachute does not open but with the contingency of a reserve parachute) i.e. the risk before and after mitigation.

Consequence

The ascription of significance for decision-making becomes then relatively simple. It requires the consequences to be ranked and likelihood to be defined of that consequence. In Error! Reference source not found. **6**, a scoring system for consequence ranking is shown. Two important features should be noted in the table, namely that the scoring doubles as the risk increases and that there is no equivalent 'high' score in respect of benefits as there is for the costs. This high negative score serves to give expression to the potential for a fatal flaw where a fatal flaw would be defined as an impact that cannot be mitigated effectively and where the associated risk is accordingly untenable. Stated differently, the high score on the costs, which is not matched on the benefits side, highlights that such a fatal flaw cannot be 'traded off' by a benefit and would render the proposed project to be unacceptable.

Table 8: Ranking of Consequence

Environmental Cost	**Inherent risk**
Human health – morbidity / mortality, loss of species	High
Material reductions in faunal populations, loss of livelihoods, individual economic loss	Moderate – high
Material reductions in environmental quality – air, soil, water. Loss of habitat, loss of heritage, amenity	Moderate
Nuisance	Moderate – low
Negative change – with no other consequences	Low
Environmental Benefits	**Inherent benefit**
Net improvement in human welfare	Moderate – high
Improved environmental quality – air, soil, water. Improved individual livelihoods	Moderate

[1] Because 'probability' has a specific mathematical/empirical connotation the term 'likelihood' is preferred in a qualitative application and is accordingly the term used in this document.

Economic Development	Moderate – Low
Positive change – with no other consequences	Low

Likelihood

Although the principle is one of probability, the term 'likelihood' is used to give expression to a qualitative rather than quantitative assessment, because the term 'probability' tends to denote a mathematical/empirical expression. A set of likelihood descriptors that can be used to characterise the likelihood of the costs and benefits occurring, is presented in Error! Reference source not found.**7.**

Table 9: Likelihood categories and definitions

Likelihood Descriptors	Definitions
Highly unlikely	The possibility of the consequence occurring is negligible
Unlikely but possible	The possibility of the consequence occurring is low but cannot be discounted entirely
Likely	The consequence may not occur but a balance of probability suggests it will
Highly likely	The consequence may still not occur but it is most likely that it will
Definite	The consequence will definitely occur

It is very important to recognise that the likelihood question is asked twice. The first time the question is asked is the likelihood of the cause and the second as to the likelihood of the consequence. In the tables that follow the likelihood is presented of the cause and then the likelihood of the consequence is presented. A high likelihood of a cause does not necessarily translate into a high likelihood of the consequence. As such the likelihood of the consequence is not a mathematical or statistical 'average' of the causes but rather a qualitative estimate.

Residual Risk

The residual risk is then determined by the consequence and the likelihood of that consequence. The residual risk categories are shown in **Error! Reference source not found.**8, where consequence scoring is shown in the rows and likelihood in the columns. The implications for decision-making of the different residual risk categories are shown in **Error! Reference source not found.**9.

Table 10: Residual Risk Categories

		Residual risk				
Consequence	High	Moderate	High	High	Fatally flawed	
	Moderate – high	Low	Moderate	High	High	High
	Moderate	Low	Moderate	Moderate	Moderate	Moderate
	Moderate – low	Low	Low	Low	Low	Moderate
	Low	Low	Low	Low	Low	Low
		Highly unlikely	Unlikely but possible	Likely	Highly likely	Definite
		Likelihood				

Table 11: Implications for Decision-Making of the Different Residual Risk Categories

Rating	Nature of implication for Decision – Making
Low	Project can be authorised with low risk of environmental degradation
Moderate	Project can be authorised but with conditions and routine inspections
High	Project can be authorised but with strict conditions and high levels of compliance and enforcement
Fatally Flawed	The project cannot be authorised

Refer to **Appendix I** for the detailed Impact Assessment Tables.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

The impacts listed below is a combination of the impacts identified by the various specialist studies conducted, as indicated in **Appendix G**.

Proposal

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**
Loss of vegetation communities *Construction Phase*	Low negative	• The construction and operational footprint of the development must not extend past the footprint demonstrated within the proposed development plan. All construction laydown areas should be placed within existing disturbed areas and not within any sensitive habitat located nearby. • All access to the proposed development must be limited to existing access roads and pathways. No ad hoc roadways should be permitted, without first being authorised by the ECO and the CA. • A rehabilitation plan must be compiled for this project. The plan must make use of locally occurring indigenous plant species, and consider the seasonal conditions experienced within the study area. • Rehabilitation activities must persist until at least 95% of natural cover is achieved within the footprint.	Very low negative	
Loss of Plant Species of Conservation Concern (SCC) *Construction Phase*	Low negative	• No plant species (SCC or common) must be harvested or removed from site without approval from the ECO or Applicant in writing. • If any protected plant species are found within the construction footprint, the allocated authority must issue permits before construction commences on site. • If any protected species die during the construction phase, all losses must be offset at a ratio of 1:3 for each individual species lost.	Very low negative	
Loss of Faunal Species of Conservation	Low negative	• No killing of fauna must be tolerated. • Environmental awareness training must be conducted by the ECO before any new staff commence with work on site. This must include the adequate identification of the	Very low negative	

Concern (SCC) *Construction Phase*		following species: ○ *Circus ranivorus* (African marsh-harrier) ○ *Crocidura maquassiensis* (Makwassie Musk Shrew) ○ *Hydrictis maculicollis* (Speckle-throated Otter ○ *Pyxicephalus adspersus* (African Bullfrog) • Any excavations or holes must be checked regularly for fauna that may have either occupied the area or may have fallen in accidentally. The design of deep excavations should consider nearby fauna (especially reptiles). • Construction should not take place during the evening and should be restricted between 07h00 and 16h30. • Any lighting established on site must not point outwards toward any natural habitat (especially wetlands or rivers) and should be focus downwards or towards the development.		
Fragmentation, Loss of Ecosystem Function and Edge Effects *Construction Phase*	Low negative	• Support structures must be used when working below any water-level e.g. within close proximity to the existing dams on university grounds. • All watercourses outside of the development footprint must be considered as no-go areas and must be avoided where possible. • Site camps and / or laydown areas must not be situated within 50m from a watercourse and / or 1:100 year flood line of a river. • The proposed development footprint must be kept as small as possible and ensure that all non-operational areas are rehabilitate to a suitable condition. • Rehabilitation must extend into the PAOI and not only the proposed development footprint.	Very low negative	
Invasion of Alien Plant Species *Construction Phase*	Low negative	• An Alien Invasive Plant Species Control Plan must be developed by the Contractor and include both construction and operational phase requirements. • No dumping of cleared alien vegetation must be allowed on site. All cleared material must be appropriately disposed of at a registered landfill. • Alien invasive plant control regimes must include the entire site and PAOI. • Areas which are to be cleared of vegetation, must remain as small as possible to	Very low negative	

		reduce the risk of further proliferation of alien vegetation, and in order to keep a level of protection to the wetlands and drainage lines during construction through slowing storm water runoff and sediment trapping. • Clearing should take place in a phased approach in order to reduce the overall extent of exposed land, which will contribute to minimising large sediment depositions into the stream. • Alien invasive plant species are to be removed within the project area and are to be disposed of in the correct manner. • Restrict construction activities within the designated construction areas.		
Sewage Spills and Leaks from Conveyance System *Construction Phase*	Very low negative	• Strict inspection measures are to be implemented on site. • Spill containment measures are to be implemented along the construction route of conveyance systems.	Very low negative	
Usage and Storage of Hydrocarbon Products *Construction Phase*	Very low negative	• Ensure that good housekeeping rules are applied. • Ensure vehicles and equipment are in good working order. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. • Drip trays or any form of oil absorbent material must be placed underneath construction vehicles/machinery and equipment when not in use. • Only re-fuel machines at fuelling point, construct structures to trap fuel spills at fuelling point, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only. • Any possible contamination of topsoil by hydrocarbons, concrete or concrete water must be avoided. Spill kits must be available and on hand to clean these spills. • A procedure for the storage, handling and transport of different hazardous materials must be drawn up and strictly enforced. • Materials must be stored in bunded areas that can accommodate the required volumes.	Very low negative	

Usage of on-site Sanitation Systems *Construction Phase*	Very low negative	• All on-site sanitation systems (eg. Pit toilets, VIP toilets, mobile toilets) must be lined or/and effectively contain human waste. • The contractor should provide a minimum of one toilet per 10 persons**.** • No temporary facilities and / or portable toilets may be set up within 30 m of ecologically sensitive areas such as riparian zones and watercourse features, including wetlands. • No temporary facilities or portable toilets to be setup within identified drainage or wetland areas.	Very low negative	
Loss of wetland area/functionality *Construction Phase*	Low negative	• Prior to construction, effective barriers should be erected in such a manner to prevent access and damage to the delineated wetlands and the associated 20 m buffer area. • The construction footprint must be kept as small as possible in order to minimise the impact on the surrounding environment. • Where feasible, align the pipeline with existing infrastructure. This must include attaching the pipeline to bridges/causeways to span the watercourse. • Prioritise and schedule construction of the pipeline across wetlands during the low flow period. • The time taken to construct in a wetland must be kept to a minimum (preferably < 24 hours), this will include excavation of the trench, pipe installation, backfill and restoration of the wetland. On completion of a crossing should work proceed to the next crossing. If applicable. • Any temporary flow diversions must be removed after installation of the pipeline, and rehabilitation of the crossing. • Naturally occurring flora should be preserved as far as possible, especially in the 20 m buffer area. • Any discharge of runoff into the wetlands or streams must be done in such a way as to prevent erosion. • A landscaping/ rehabilitation plan should be developed and implemented from the onset of the project. • Only indigenous plant species, preferably species that are indigenous to the natural	Very low negative	

		vegetation of the area, should be used for landscaping/ rehabilitation. • All personnel and contractors must undergo Environmental Awareness Training, with particular reference to the wetland and its associated buffer area. • A Topsoil Management Plan must be developed and implemented. • Topsoil must be preserved and used during the rehabilitation phase.		
Excavation of trenches *Construction Phase*	Low negative	• Dewatering of trenches must pass through a slit fence/sock to prevent siltation of the wetlands or drainage lines. • The pipeline must be buried below the elevation of the wetland surface. The profile of the wetland must not be permanently lowered during construction. Rehabilitation of the crossing must restore to the natural (or original) profile of the crossing. • The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm. • The proposed pipeline system must be divided up into intervals. Each interval's soil must be stockpiled and filled back up (in the correct order) to avoid long periods of stockpiling. • No stockpiling of soils is to take place within the wetlands or the 20 m buffer, and stockpiles may not exceed 2 m in height. • Any remaining soils following the completion of construction activities are to be levelled and re-seeded with indigenous flora species to minimise the risk of further sedimentation of the stream.	Very low negative	
Increased Local Traffic *Construction Phase*	Very low negative	• Limit construction vehicle movement during peak periods. • Erect warning/informative signs (billboards) on site. These should indicate the operation hours and when works are likely to be operational. The signs should be positioned in a way to be easily viewed by the public and mostly motorists. • Staff and maintenance trips should occur outside of peak traffic periods. • Client/Facility Manager is to ensure that regular maintenance of gravel roads (located within the site boundary, including the access road to the site) occurs during operation phase to minimise/mitigate dust pollution.	Very low negative	
Construction of	Low	• It is important that a storm water management plan must be developed and	Very low	

Storm Water Systems *Construction Phase*	negative	implemented from the onset of the project, and continued for the life of the project in to prevent significant impacts on the hydrological functioning of the system.	negative	
Construction of temporary roads *Construction Phase*	Low negative	• Make use of existing access routes.	Very low negative	
Increased Waste Production *Construction Phase*	Very low negative	• Properly marked waste collection bins should be supplied by the contractor and all solid waste collected shall be disposed of at a licensed waste disposal facility.	Very low negative	
Increased Erosion and Sedimentation *Construction Phase*	Low negative	• Create energy dissipation at stormwater discharge areas to prevent scouring. • Temporary and permanent erosion control methods may include silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed areas, erosion mats, and mulching.	Very low negative	
Damage or Destruction of Heritage Resources *Construction Phase*	Very low negative	• No archaeological remains or graves were recorded along the proposed sewer pipeline route or development area. However, the chance find procedure must be put in place to deal with accidental finds. • Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue. • Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed form site. • Location of the proposed development infrastructure should be restricted to minimum footprint.	Very low negative	
Palaeontological Resources	Low negative	• Implement Fossil Chance Find Protocol if fossils are seen on the surface and when drilling/excavations commence.	Very low negative	

Construction Phase				
Loss of Faunal Species of Conservation Concern (SCC) *Operational Phase*	Very low negative	• Maintenance staff must not be allowed to hunt or injure animals occupying habitat adjacent to the pipeline route. • Any snares found by staff must be reported to the project team for investigation.	Very low negative	
Invasion of Aline Plant Species *Operational Phase*	Moderate negative	• An Alien Invasive Plant Species Control Plan must be developed by the holder of the EA to be implemented during the operational phase of the development. • Alien invasive plant control regimes must include the entire site and PAOI. • Ongoing alien and invasive plant monitoring and control should take place throughout the operational phase of the pipeline.	Very low negative	
Sewage Spill along Conveyance System *Operational Phase*	Low negative	• Strict inspection and maintenance routines are to be implemented on site. • Drain systems are to be installed along the pipelines where groundwater sensitive areas are crossed. • Water quality monitoring points are to be installed within the sub-drainage system. • Frequent water quality monitoring is to be undertaken (DWS to decide on frequency).	Very low negative	
Proper Maintenance of Sewer Infrastructure *Operational Phase*	Low negative	• Ongoing maintenance should be undertaken to ensure no sewerage leaks occur. • No new access roads must be created throughout the maintenance phase of the pipeline.	Very low negative	
Alteration of Sub-surface Flows *Operational Phase*	Low negative	• Ongoing maintenance should be undertaken to ensure no sewerage leaks occur.	Very low negative	
Increased	Low	• The proposed Leeuwkuil wastewater treatment conveyance system should proceed.	High positive	

Sanitation Services and Improved Sewage Management *Operational Phase*	positive			
Employment Creation *Operational Phase*	Low positive	• Upgrade of wastewater conveyances in order to create job opportunities by employing local labour as far as possible.	High positive	

Alternative 1 (REPEAT THIS TABLE FOR EACH 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

No Go

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

The no-go option for this project implies that the existing Leeuwkuil wastewater conveyances will not be upgraded. Although this option would avoid the mostly low negative environmental impacts of the proposed project described above, that would imply that the current situation of sewage spillage and negative environmental impact will continue unabated.

With the No-Go alternative being followed, the Leeuwkuil conveyance system will also not be upgraded and will therefore remain unable to cater for the current and future local and municipal needs. Sewage overflow discharge into the Vaal River will continue (as is currently the case), continuously degrading the watercourse quality and other related user health impacts.

With the No-Go alternative being followed, no additional job opportunities will be created.

Should the authorities decline the application, the 'No-Go' option will be followed and the current status quo of the site will remain.

The need for upgraded wastewater conveyances in the local area (which is able to cater for the current and future demands) outweighs the potential impacts of the proposed project to the surrounding environment. The impact to the surrounding environment is expected to be of low negative significance, at worst, and these can be proactively mitigated to acceptable levels. Therefore, the no-go alternative is not preferred.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

The following specialist reports have been used to fill in the above tables and are attached to **Appendix G** of this DBAR:

1. Groundwater Impact Assessment by SRK Consulting (South Africa) Pty Ltd;
2. Heritage Impact Assessment by Beyond Heritage (Pty) Ltd;
3. Palaeontological Impact Assessment by Prof Marion Bamford (University of the Witwatersrand);
4. Wetland Assessment Report by EP3 Environmental (Pty) Ltd;
5. Ecological Impact Assessment by Afzelia Environmental Consultants (Pty) Ltd.

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

The following gaps in knowledge and assumptions were made in the assessment and impacts associated with the proposed development.

- The information provided to the EAP by the applicant and the specialists was accurate and true, and was relevant and applicable during the period when the draft BAR was prepared;

- No alternatives were considered for the proposed development;

- The construction activities of the proposed sewer pipelines would not exceed standards for air quality and particulate matter provided by the NEMAQA and thus air quality would not be significantly impacted by the proposed development;

- The proposed sewer pipelines would be buried underground and thus would not have further air quality impacts from the operational phased of the development;

- Only significant impacts that can arise from the construction, operation and maintenance of the proposed sewer pipelines have been included in the impact assessment;

- It has been illustrated through the implementation of the above mentioned mitigation measures, together with the draft Environmental Management Programme, that the impacts associated with the proposed sewer pipelines installation and operation can be mitigated to acceptable levels thus allowing the development to proceed; and

- Closure is not envisaged for the project. As such, decommissioning and rehabilitation would be applicable in the post-construction phase (excluding concurrent rehabilitation).

The specialist studies were taken as a snap shot of the status quo of the environment, however with historical and regional information this is not considered to be a substantive gap.

Geohydrological Assessment:

- Opinions presented in the report apply to the site conditions and features as they existed at the time of the investigations, and those reasonably foreseeable; and

- The Assessment applies to the highly sensitive areas where the pipelines and facilities could influence the groundwater resources;

- Although no groundwater samples could be collected during the hydrocensus, the potential (existing) contamination sources were included and described.

Wetland Assessment:

- In order to gain detailed information regarding the geomorphology, hydrology, vegetation and functioning of particular wetlands, assessments should ideally be carried out over numerous seasons, over a number of years. The current study however, relied on information gained during a two day field survey which was conducted during a single season. Regardless, desktop analysis for the area, professional judgment and experience, were considered to be sufficient for the purposes of the study;

- The Global Positioning System (GPS) used for wetland delineations is accurate within approximately five meters. Therefore, the wetland delineation plotted utilising the GPS data may be inaccurate by at most five meters on either side;

- The risk assessment did not include decommissioning and closure phases, as the project is permanent, should any infrastructure upgrades be required on a later stage it must be re-assessed;

- Impacts were assessed based on the development disclosed by the client at the time of this study. Any new developments would have to be assessed in a separate study;

- The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken.

Heritage Impact Assessment:

- The authors of the Heritage Impact Assessment acknowledged that the brief literature review is not exhaustive on the literature of the area;

- Due to the nature of heritage resources and field surveys, the possibility exists that some features or artefacts may not have been discovered or recorded. The possibility of grave occurrences and other cultural material can therefore not be excluded. This limitation is however successfully mitigated with the implementation of a Chance Find Procedure and monitoring of the study area by the Environmental Control Officer;

- This Heritage Impact Assessment Report covers the footprint area of the proposed development exclusively and the field survey did not include any form of subsurface inspection

- This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components will be highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

Palaeontological Impact Assessment:

- A desktop study Palaeontological Impact Assessment was completed for the proposed development which included no field visits. The desktop analysis for the area, professional judgment and experience, were considered to be sufficient for the purposes of the study.

Terrestrial Biodiversity Impact Assessment:

- The Project Area of Influence (PAOI) has been calculated to be 25 m due to the nature and scale of the proposed development;

- Fieldwork was conducted at the end of autumn (May) and the beginning of winter (June). Although this is not during the “wet season” for the area, there was significant rainfall before the assessment. The data collected during the fieldwork is therefore considered sufficient in making a decision;

- Portions of the study had been recently burned to stimulate re-growth within the grassland habitat. In these instances, adjacent properties were inspected to determine the likely cover and species composition within the burnt fields;

- During the field assessment one (1) camera trap was stolen. Data collected during this period was consequently lost. It is however unlikely that this incident had much influence on the findings of the report and no follow-up assessment has been recommended;

- The vegetation units identified at a desktop level will differ to those observed in-situ as the site has historically been transformed throughout the study area;

- Plant species display a range of morphological and physiological attributes that determine their growth, reproduction and survival. It is therefore unlikely that all plant species identified on site will remain the same over temporal and spatial scales;

- An accurate delineation of the surrounding watercourses was not a part of the terrestrial specialist’s scope, but all nearby watercourses identified at a desktop level have been considered in the assessment in terms of their ecological significant;

- To accurately record the species on site, long-term field assessments would have to be conducted to consider seasonal and temporal variations and provide more accuracy. The completed assessment is however considered appropriate for the scale and nature of the proposed development.

3. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

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**
Based on the nature of the proposed development, decommissioning and closure is not envisaged. However, recommendations for post-construction decommissioning and closure of the construction site and activities have been stated in the Draft Environmental Management Programme and must be implemented.				

Alternative 1

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**

Alternative 2

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**

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

N/A

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

N/A

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

The NEMA EIA Regulations define cumulative impact as follows: "*in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area*."

The previous sub-sections assessed the potential environmental impacts which could occur as a result of the construction and operation of the proposed project. The impacts assessed above are direct and immediate, whereas cumulative impacts may not be significant on their own but become significant when coupled with others. In order to consider the cumulative impact, the impacts of the proposed development and its intended purpose, as assessed above, must be placed in context.

The existing Leeuwkuil wastewater conveyance system, together with other infrastructure development and human activities, have resulted to the loss of flora and fauna habitat and decreased water quality of adjacent watercourses. The upgrading of the proposed conveyance systems will not have additional and significant cumulative environmental impacts. Therefore, cumulative impacts are not deemed to be significant in the context and nature of this project.

5. ENVIRONMENTAL IMPACT STATEMENT

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

Proposal

The Impact Assessment identified that the impacts applicable during the construction and operational phases of the wastewater conveyance system, will be of moderate to very low significance. The Environmental Assessment Practitioner is of the opinion that the impacts to the receiving environment during the construction and operational phases will be of very low significance with the implementation of mitigation measures and conditions as set out in the EMPr.

Without upgrading the Leeuwkuil conveyance system, the system will remain unable to cater for the current and future local and municipal needs. Sewage overflow discharge into the Vaal River will continue (as is currently the case), continuously degrading the watercourse quality and other related user health impacts. The need for upgraded wastewater conveyances in the local area (which is able to cater for the current and future demands) therefore outweighs the potential impacts of the proposed project to the surrounding environment.

Alternative 1

N/A - no alternatives have been considered since the upgrade is applicable to the current infrastructure.

Alternative 2

N/A - no alternatives have been considered since the upgrade is applicable to the current infrastructure.

No-go (compulsory)

The no-go option for this project implies that the existing Leeuwkuil wastewater treatment conveyances will not be upgraded. Although this option would avoid the mostly low negative environmental impacts of the proposed project described above, that would imply that the current situation of sewage spillage and negative environmental impact will continue unabated.

With the No-Go alternative being followed, the Leeuwkuil conveyance system will also not be upgraded and will therefore remain unable to cater for the current and future local and municipal needs. Sewage overflow discharge into the Vaal River will continue (as is currently the case), continuously degrading the watercourse quality and other related user health impacts.

With the No-Go alternative being followed, no additional job opportunities will be created.

Should the authorities decline the application, the 'No-Go' option will be followed and the current status quo of the site will remain.

The need for upgraded wastewater conveyances in the local area (which is able to cater for the current and future demands) outweighs the potential impacts of the proposed project to the surrounding environment. The impact to the surrounding environment is expected to be of low negative significance, at worst, and these can be proactively mitigated to acceptable levels. Therefore, the no-go alternative is not preferred.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

Impact Category	*Significance before mitigation*	*Significance after mitigation*
Construction Phase		
Loss of vegetation communities	Low negative	Very low negative
Loss of plant species of conservation concern	Low negative	Very low negative
Loss of faunal species of conservation concern	Low negative	Very low negative
Fragmentation, loss of ecosystem function and edge effects	Low negative	Very low negative
Invasion of alien plant species	Moderate negative	Very low negative
Sewage spills and leaks from conveyance systems	Very low negative	Very low negative
Usage and storage of Hydrocarbon products	Very low negative	Very low negative
Usage of on-site sanitation systems	Very low negative	Very low negative
Loss of wetland area/functionality	Low negative	Very low negative
Excavation of trenches	Low negative	Very low negative
Increased local traffic	Very low negative	Very low negative
Construction of storm water systems	Low negative	Very low negative
Construction of temporary roads	Low negative	Very low negative
Increased waste production	Very low negative	Very low negative
Increased erosion and sedimentation	Low negative	Very low negative
Damage or destruction of heritage resources	Very low negative	Very low negative

Damage or destruction of palaeontological resources	Low negative	Very low negative
Operational Phase		
Loss of faunal species of conservation concern	Very low negative	Very low negative
Invasion of alien plant species	Moderate negative	Very low negative
Sewage spill along conveyance system	Low negative	Very low negative
Proper maintenance of sewer infrastructure	Low negative	Very low negative
Alteration of sub-surface flows	Low negative	Very low negative
Increased sanitation services and improved sewage management	High positive	High positive
Employment creation	Low positive	High positive

From the Impact Assessment and specialist studies, it can be concluded the residual risks / benefits to be considered for decision making of the proposed development are summarised below:

Consequence	***Residual Risk / Benefit***
Negative consequences	
Material Reductions in Environmental Quality	Moderate
Loss of Heritage - and Palaeontological Resources with Cultural Significance	Moderate
Nuisance	Low
Positive consequences	
Improved human welfare	High

For alternative:

N/A - no alternatives have been considered since the upgrade is applicable to the current infrastructure.

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The proposed Leeuwkuil wastewater treatment conveyance upgrades are required to cater for the current and future local and municipal needs and prevent further sewage overflow discharge into the Vaal River. Due to the fact that the proposed upgrades are planned to take place within the existing sewer lines servitude no alternatives to the proposal has been proposed.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

Emfuleni Local Municipality Integrated Development Plan (IDP, 2021/2022)

All efforts have been made to align the current IDP 2021/22 of the ELM IDP's to the National Sustainable Development Goals (SDGs 2030). The ELM IDP identifies need to invest more in water and sanitation services within the municipality. Thus, the upgrading of the Leeuwkuil wastewater treatment conveyances will be aligned to the municipality's development goals.

Gauteng Environmental Management Framework (EMF)

This EMF was used to analyse and determine whether the approval of the application for the proposed development will compromise the integrity of the existing environmental management priorities for the area and if so, justify the identified impacts in terms of sustainability considerations

DEA Screening Tool

Environmental Authorisation (EA) applications are required to submit a report generated from the national web based environmental screening tool, as contemplated in regulation 16(1)(b)(v) of the environmental impact assessment regulations, GNR.982 of December 2014. The report generated from the DEA Screening tool for proposed development has been included as part of **Appendix I** of this report. The screening tool provided a background and preliminary findings for spatial development and biophysical sensitivities within the area of the proposed development, against which a literature review and specialist reports were used to verify the information and inform the EAP's opinion.

8. RECOMMENDATION OF THE 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 as bound by professional ethical standards and the code of conduct of EAPASA).	**YES**	~~NO~~

If "NO", indicate the aspects that require further assessment 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 competent authority in respect of the application:

The following is a list of recommendations made by the EAP as well as the specialists:

- The EMPr is a legally binding document and the mitigation measures stipulated within the document and BAR will be implemented by the appointed contractor;
- An independent ECO will must be appointed to manage the implementation of the EMPr during all development phases of the project;
- The plans for alien invasive plant species control, erosion, top soil and storm water management, as well as the rehabilitation and maintenance plan must be developed and implemented prior to the commencement of construction activities;
- The Storm Water Management Plan must be implemented to ensure sustainable urban drainage;
- It is recommended that the Contractor's construction schedule is approved in writing prior to the start of construction and that penalties are issued for any unsubstantiated delays. Construction within wetland and transitional habitat must be as brief as possible, to prevent any impacts from causing significant and unsustainable harm to habitat on site, and located downstream from each site;
- The Contractor must include environmental topics within toolbox talks at least once a month, and should be made aware of the protected plant species found within the study area and the presence of sensitive habitat nearby (wetland, rivers and

grassland). A list of fines for transgressions must be appended to the EMPr;

- All natural habitats found outside the development footprint must remain untouched, and listed as a no-go area, unless for management and maintenance purposes.

- The proposed development must as far as possible provide employment opportunities to the local people during the construction phase (as far as possible);

- A WUL related to under Section 21(c) and (i) of the NWA will need to be obtained prior to the commencement of construction. The WULA process has begun and registration forms must be submitted to DWS in the Gauteng Province for approval prior to the commencement of construction;

- Prior to construction, effective barriers should be erected in such a manner to prevent access and damage to the delineated wetlands and the associated 20 m buffer area;

- Temporary and permanent erosion control methods may include silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed areas, erosion mats, and mulching;

- Areas which are to be cleared of vegetation, must remain as small as possible to reduce the risk of further proliferation of alien vegetation, and in order to keep a level of protection to the wetlands and drainage lines during construction through slowing storm water runoff and sediment trapping;

- No plant species (SCC or common) must be harvested or removed from site without approval from the ECO or Applicant in writing. If any protected plant species are found within the construction footprint, the allocated authority must issue permits before construction commences on site;

- The construction and operational footprint of the development must not extend past the footprint demonstrated within the proposed development plan. All construction laydown areas should be placed within existing disturbed areas and not within any sensitive habitat located nearby (e.g. wetlands, riverbanks or natural grasslands).

- All access to the proposed development must be limited to existing access roads and pathways. No ad hoc roadways should be permitted, without first being authorised by the ECO and the CA;

- Refuse must be temporarily stored in waste bins and thereafter disposed of at registered landfill site prior to reaching full bin capacity to avoid overflowing on site to ensure the protection of sensitive ecological areas;

- Oil and hydrocarbon spillages must be actively managed on site, by undertaking routine inspections and service of the construction vehicles, placing eco mats underneath leaking vehicles to absorb any spillages and by removing soil containing spillages for disposal as a hazardous waste;

- Drain system are to be installed along the pipeline where sensitive groundwater areas are crossed;

- Water quality monitoring points should be installed within the sub-drainage system;
- No archaeological remains or graves were recorded along the proposed sewer pipeline route or development area. However, the chance find procedure must be put in place to deal with accidental finds;
- Following construction, disturbed areas to be reshaped to the original contours and to blend in with the surrounding topography, and all areas that have been cleared of vegetation must be rehabilitated with appropriate indigenous seed-mix. A site-specific rehabilitation plan must be compiled by a suitable qualified ecologist and implemented by a suitably qualified rehabilitation specialist.

9. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT (as per notice 792 of 2012, or the updated version of this guideline)

The proposed facility upgrades are required in order to cater for the fast growing population in the Leeuwkuil catchment, accommodate sewage flow from the Vereeniging and eastern Vanderbijlpark catchment and also to cater for future planned developments in the area. As part of The Technical Feasibility Report (TFR), Emfuleni Local Municipality recommended that Leeuwkuil WWTW be upgraded with 25Mℓ/d to provide immediate capacity and allow for the moratorium development to be lifted. This additional capacity will accommodate sewage flows from Vereeniging catchment and eastern Vanderbijlpark catchment.

The existing sewerage infrastructure within the Sedibeng District Municipality (SDM) is ageing and not operating at the desired or required capacity. The existing sewerage infrastructure within the Leeuwkuil WWTW (Vereeniging and surroundings) catchments will not be able to handle the sewage generated from future developments. For this reason, Metsi-a-Lekoa, the water services provider of ELM, in conjunction with SDM proposes to develop a regional sanitation scheme for the area. The scheme will therefore provide the following benefits to society:

- Create bulk sanitation capacity in the Sedibeng region;
- Deliver effective solutions to prevent pollution of water resources;
- Unlock development projects that require sanitation services; and
- Facilitate local economic development and socio-economic upliftment.

The SRSS is seen as a flagship project of Sedibeng's Growth and Development Strategy and has the potential to contribute to:

- Economic growth and development through job creation and improved capacity for industrial growth;
- A renewal of Sedibeng's communities though the unlocking of development potential and improved quality of life;
- An improved impact on Sedibeng's environment through reduced frequency and volumes of raw sewage spills.

The potential benefit of the proposed upgrades are therefore focussed on the stimulation of the local economy through the additional employment opportunities created and to

improve sludge management at the plant and cater for the current and future developments. It important to note that the proposed development will indirectly and directly improve the social economy status on a local and regional scale, economies will also be stimulated in the form of additional employment opportunities which will act as a catalyst promoting economic growth within the Sedibeng Region.

The local communities of the area will benefit in the following ways:

- Improve effluent quality;
- Reduce sewer spillages from the pump stations; and
- Enhance skills development through capacity building of process controllers.

The proposed development will have positive benefits to the society in general, through providing local employment opportunities and also benefiting local business during the construction phase of the project. The proposed development cater for the fast growing population, and accommodate sewage flow from Vereeniging catchment and eastern Vanderbijlpark catchment and future planned development. This will create a bulk sanitation capacity in the Sedibeng region, deliver effective solutions to prevent pollution into the Vaal River and improve the water quality and other related user health impacts.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED
(CONSIDER WHEN THE ACITIVTY IS EXPECTED TO BE CONCLUDED)

Decommissioning and closure is not envisaged for the proposed conveyances and will remain as permanent structures post-construction phase.

The construction phase will require environmental authorisation for a period of at least three (3) years.

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached	**YES**

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Other information

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.