



BASIC ASSESSMENT PROCESS
For
**THE PROPOSED VORNA VALLEY EMERGENCY WATER PIPE REPLACEMENT IN
THE CITY OF JOHANNESBURG, GAUTENG PROVINCE**

DRAFT BASIC ASSESSMENT REPORT

Public Review Period:
25 January 2019 to 25 February 2019

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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 1)

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 (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority 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. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed 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. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
 12. 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.
 13. 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 of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
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.

Not Applicable

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

No

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

There are currently no plans to decommission

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?

No

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

Yes

Refer to Appendix E9 – IAP Register

If no, state reasons for not attaching the list.

Have State Departments including the competent authority commented?

N/A

If no, why?

This information will be available after DBAR has been reviewed

PROJECT DETAILS

Reference #:	Not yet assigned
Title:	Environmental Impact Assessment Process The Proposed Vorna Valley Emergency Water Pipe Replacement in the City of Johannesburg, Gauteng Province
Report compiled by:	Company Name: Envirolution Consulting Contact person: Ms Sheila Bolingo Postal Address: P.O. Box 1898, Sunninghill, 2157 Telephone Number: 0861 44 44 99 Fax Number: 0861 62 62 22 Email: sheila@envirolution.co.za
Client	: Johannesburg Water SOC Ltd
Report Status	: Draft Basic Assessment Report for Public Review
Review period	The 30-day period for review is from 25 January 2019 to 25 February 2019

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PUBLIC REVIEW OF THE DRAFT BASIC ASSESSMENT REPORT

The Draft Basic Assessment Report (BAR) has been prepared by Envirolution Consulting (Pty) Ltd in order to assess the potential environmental impacts associated with the Proposed Vorna Valley Emergency Water Pipe Replacement in the City of Johannesburg. The report is made available for public review for 30-day review period from **25 January 2019 to 25 February 2019** at the following places:

- Halfway House Public Library

In order to obtain further information, register on the project database or submit your written comment to:

Environmental Assessment Practitioner

Name: Sheila Bolingo
Physical Address: Vista Place, Suite 1a & 2, No 52,
Cnr Vorster Avenue & Glen Avenue,
Glenanda
Postal Address: PO Box 1898, Sunninghill, 2157
Telephone Number: (0861) 44 44 99
Fax Number: (0861) 62 62 22
E-mail: sheila@envirolution.co.za

The due date for comments on the Draft Basic Assessment Report is 25 February 2019.

EXECUTIVE SUMMARY

Johannesburg Water SOC LTD is proposing upgrading and replacement of an the existing water pipe within identified sections of Vorna Valley, situated in Midrand under region A of the city of Johannesburg. The pipe replacement project will be implemented along Le Roux Avenue starting from Albertyn Street and ending at Pretorious Road in Vorna Valley. Figure 1 below shows the project location of the water pipe replacement in Vorna Valley.

Johannesburg Water's Operations Department, Midrand Depot have through a work request, requested a replacement of two (2) Asbestos Cement (AC) pipes of diameters of 200mm and 250mm running approximately 970m parallel, with 355mm diameter Steel (ST) pipe along Le Roux Avenue due to continuous bursts experienced by the pipes. The existing pipes are crossing a stream at two points and that has made it difficult to operate and maintain the pipes when there is a pipe burst. Vorna Valley Emergency Water Pipe Replacement project aims at replacing the existing Asbestos Cement pipes in the area with the approved Steel pipes as per Johannesburg Water's standard design guidelines, which will help improve the level of service and also curb the loss of water.

A large section of the pipeline falls within modified land comprising of sidewalks or paving within the residential area of Vorna Valley. The upgrade of the pipeline will necessitate two (2) water crossings which were the focus of this assessment. Since the project will have an impact on the environment and the stream, an Environmental Impact Assessment (EIA) and a Water Use Licence Application is being undertaken and the project will be implemented after it has met all the legislation requirements and compliance as per National Environment Management Act (NEMA)

The majority of the proposed pipeline is aligned within the servitudes/ road reserve with two river crossings. Cognisant of the above-mentioned conclusions established through the basic assessment investigation, there were areas of environmental sensitivity identified at the river crossings. These include areas such as sensitive vegetation (i.e. protected plants) & watercourses, these are shown in the environmental sensitivity map (refer to **Appendix A**). The significance levels of the majority of identified negative impacts for all alternatives investigated can generally be reduced to acceptable levels thus, the proposed developments could proceed provided that the mitigation measures set out in this report and in the EMPr and the Rehabilitation Plan (**Appendix H**) are diligently implemented to limit the potential impacts on vegetation, watercourses and social during construction and operation of the developments.

It is the opinion of the specialist that no fatal flaws have been identified for the Vorna Valley Emergency Water Pipe Replacement, and that the project should proceed with adequate mitigation measures implemented to reduce impacts to local and downstream water resources.

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

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

1.1 Project Title

THE PROPOSED VORNA VALLEY EMERGENCY WATER PIPE REPLACEMENT IN THE CITY OF JOHANNESBURG, GAUTENG PROVINCE

1.2 Project Locality

Johannesburg Water SOC LTD (to be referred to Joburg Water hereafter) is proposing upgrading and replacement of an the existing water pipe within identified sections of Vorna Valley, situated in Midrand under region A of the city of Johannesburg. The pipe replacement project will be implemented along Le Roux Avenue starting from Albertyn Street and ending at Pretorius Road in Vorna Valley. **Figure 1** below shows the project location of the water pipe replacement in Vorna Valley.

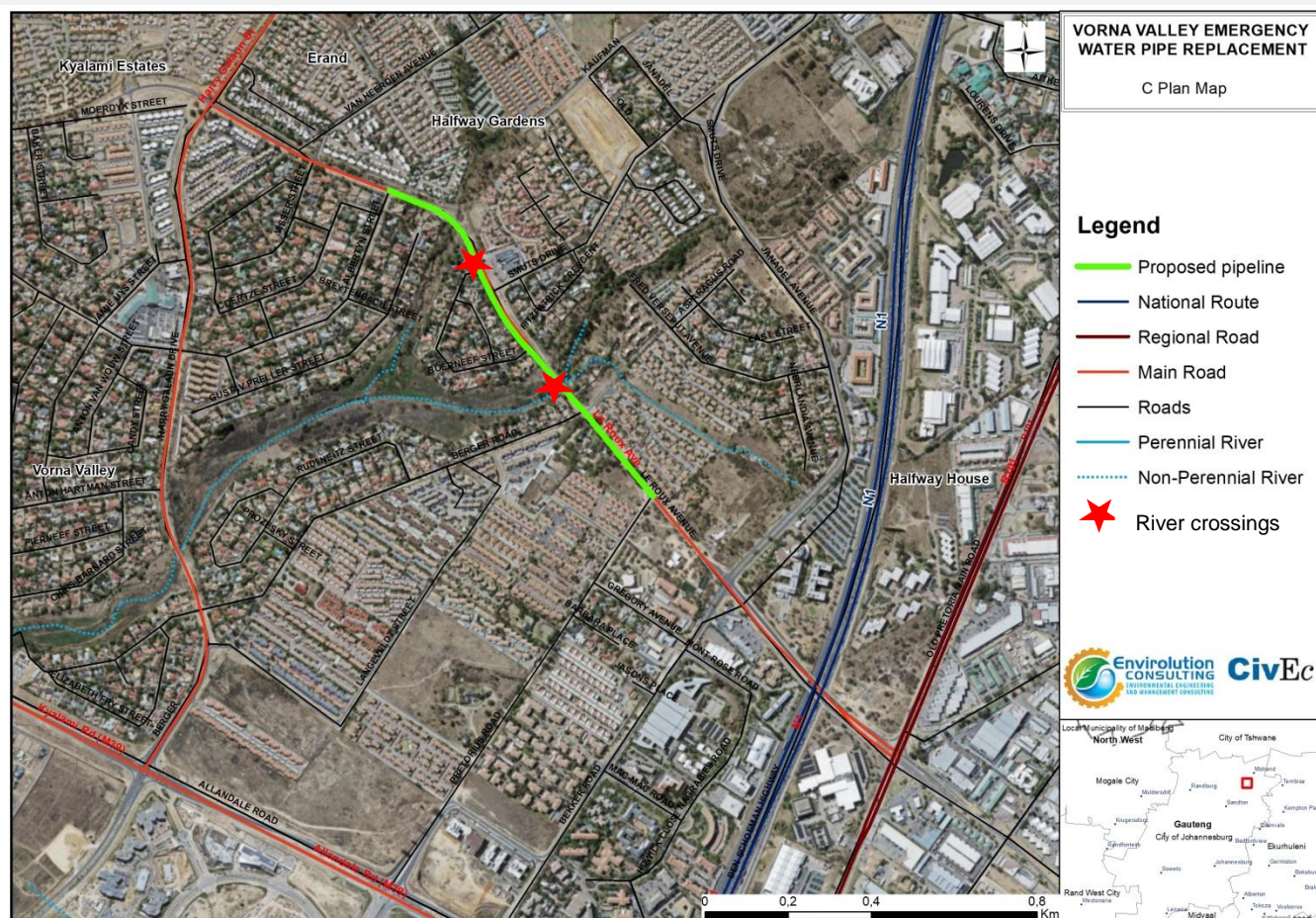


Figure 1: Locality Map showing the implemented in within Vorna Valley. (Refer to **Appendix A** for A3 maps).

1.3 Project Background

Vorna Valley Emergency Water Pipe Replacement project is a project which was initiated by Midrand Depot through a Work Request to address the continuous pipe bursts being experienced in the area due to high pressures that the pipes cannot withstand. Vorna valley is a suburb of Midrand which falls under Region A of the City of Johannesburg. The existing water pipes are Asbestos Cement (AC) pipes with a Remaining Useful Life (RUL) greater than 20 years.

Johannesburg Water's Operations Department, Midrand Depot have through a work request, requested a replacement of two (2) Asbestos Cement (AC) pipes of diameters of 200mm and 250mm running approximately 970m parallel, with 355mm diameter Steel (ST) pipe along Le Roux Avenue due to continuous bursts experienced by the pipes. The existing pipes are crossing a stream at two points and that has made it difficult to operate and maintain the pipes when there is a pipe burst. According to the Asset Register the two existing pipes have a remaining useful life greater than 20 years, but due to the fact that they cannot withstand the pressures in the area they require urgent replacement to lessen the number of bursts.

Vorna Valley Emergency Water Pipe Replacement project aims at replacing the existing Asbestos Cement pipes in the area with the approved Steel pipes as per Johannesburg Water's standard design guidelines, which will help improve the level of service and also curb the loss of water.

1.4 The scope of the works entails the following:

The scope of work will cover the construction of approximately 970m of 355mm diameter steel pipes with a working pressure of 16 bars and associated accessories. The scope of work will incorporate at least the following activities:

- Location, exposing and protection of existing services,
- Removal of man-made surfaces,
- Excavation work for the new water pipes,
- Installation of approximately 970 metres of 355mm diameter Grade X42 Steel pipes with working pressure of 16 bars or more.
- Pipe ramming on all street crossings.
- Hydraulic testing of water pipes,
- Reconnecting the existing networks to new water pipes,
- Decommissioning of old water pipes,
- Reinstatement of man-made surfaces to original condition.

1.5 Requirement for a Basic Assessment Process

A large section of the pipeline falls within modified land comprising of sidewalks or paving within the residential area of Vorna Valley. The upgrade of the pipeline will necessitate two (2) water crossings which were the focus of this assessment.

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GNR 982 to R985 (as amended), **river/watercourse crossings** is a

listed activity for which a Basic Assessment Process is required in order for Joburg Water to obtain environmental authorisation for the implementation of the pipeline over through watercourses. **Table 2** contains the listed activities in terms of the EIA Regulations and includes a description of those project activities which relate to the applicable listed activities.

Table 2: Listed Activities Applicable applied for to be authorise

Listed activities	Description of project activity that triggers listed activity
<p>Activity 19 of Listing Notice (LN) 1 of GNR 983 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse</p>	<p>The proposed project will result in infilling and depositing of more than 10m³ into a watercourse. In addition the excavation and removal of soil materials of more than 10 m³ from a watercourse will take place during the construction of the pipeline.</p>
<p>Activity 12 of GNR R.985: The clearance of an area of 300 square metres or more of indigenous vegetation</p> <p>(b) In Gauteng:</p> <ol style="list-style-type: none"> 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; 	<p>The clearance of an area of 300 square metres or more of indigenous vegetation is required for the proposed pipeline within endangered ecosystem listed in terms of section 52 of the NEMBA and Critical Biodiversity Areas /Ecological Support Areas identified in the Gauteng Conservation Plan.</p>
<p>Activity 14 of Listing Notice (LN) 3 of GNR 985 The development of:– (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs – a) within a watercourse;</p> <p>c) In Gauteng:</p> <ol style="list-style-type: none"> iv. sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) Gauteng Conservation Plan or in bioregional plans; v. sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004); vi. sensitive areas identified in an environmental management framework adopted by relevant environmental body 	<p>The proposed pipeline will be constructed over an area of 10 square meters or more within a watercourse on areas identified as Important and Ecological Support Area by the Gauteng Conservation Plan.</p>

The above listed activities have triggered a Basic Assessment Process, these activities may not commence without an environmental authorization from the competent Authority. The aim of the Environmental Impact Assessment is to ensure that:

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

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

1.6 Details of Environmental Assessment Practitioner and Expertise to conduct the Basic Assessment

Envirolution Consulting was appointed by **CivEc Engineering** on behalf of **Joburg Water** to undertake a Basic Assessment process and Water Use License for the proposed project. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix I** for CV's):

- Cheda Sheila Bolingo, the principle author of this Basic Assessment holds an Msc degree in Environmental Management with 7 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Select the appropriate box

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

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

YES

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

The pipeline will be crossing a watercourse. It is for such reasons that a Water Use License application process has to be undertaken for the development. According to the National Water Act (NWA), 1998 (Act No.36 of 1998), the proposed development requires a Water Use License as per the following regulations:

- Section 21(c): impeding or diverting the flow of water in a watercourse and;
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.

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

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

Impacts on the watercourse have been assessed through the BA process (**Appendix G3: Wetland Report**) for the infrastructure. The following reports / studies as outlined below will be required to be attached to the water use license application forms which will be submitted to the competent authority the Department of Water and Sanitation following the decision of the Basic Assessment Process by the Competent Authority GDARD.

- Basic Assessment Report
- Environmental authorization from GDARD once issued
- Wetland Assessment Specialist Study and Rehabilitation Plan

Note that timeframes for obtaining a WUL from DWS is not specified in the GDARD.

2. APPLICABLE LEGISLATION, POLICIES AND / OR GUIDELINES

Table 3: List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
National			
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> • NEMA requires, inter alia, that: <ul style="list-style-type: none"> * Development must be socially, environmentally, and economically sustainable.” * Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.” * A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.” • EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. • In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. 	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Gauteng Department of Agriculture and Resource Development 	<ul style="list-style-type: none"> • In terms of sections 24(2) and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations 2014 of GN R983 and R985; a Basic Assessment process is required to be undertaken for the proposed project.
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> • A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts. 	<ul style="list-style-type: none"> » National Department of Environmental Affairs 	<ul style="list-style-type: none"> • While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
	<ul style="list-style-type: none"> In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised. 	<ul style="list-style-type: none"> Gauteng Department of Agriculture and Resource Development 	<p>proposed project has found application in the EIA Phase.</p> <ul style="list-style-type: none"> The implementation of mitigation measures are included as part of the Draft EMPr and will continue to apply throughout the life cycle of the project.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	<ul style="list-style-type: none"> The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. In terms of the regulations published in terms of this Act (GN 921 of December 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that <ul style="list-style-type: none"> (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and (e) Pollution of the environment and harm to health are prevented. 	<ul style="list-style-type: none"> National Department of Environmental Affairs (hazardous waste) Gauteng Department of Agriculture and Resource Development (general waste) 	<ul style="list-style-type: none"> In terms of GNR921, no waste license is required for the project Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the applicable EMPr, as well as in accordance with the relevant Norms and Standards.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	<ul style="list-style-type: none"> S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas". Dust control regulations promulgated in December 2013 may require the implementation of a dust 	<ul style="list-style-type: none"> National Department of Environmental Affairs City of Ekurhuleni 	<ul style="list-style-type: none"> Reporting in terms of compliance to GNR831 will be required. While no permitting or licensing requirements arise from this legislation, this

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
	management plan.		Act will find application during the construction phase of the project. The Air Emissions Authority (AEL) may require the compilation of a dust management plan.
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring. 	<ul style="list-style-type: none"> National Department of Water Affairs Gauteng Department of Agriculture and Resource Development 	<p>The proposed development requires a Water Use License as per the following regulations:</p> <ul style="list-style-type: none"> Section 21(c): impeding or diverting the flow of water in a watercourse and; Section 21 (i): altering the bed, banks, course or characteristics of a watercourse. Requirements set by S19 will apply throughout the life-cycle of the project.
Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> National Noise Control Regulations (GN R154 dated 10 January 1992) 	<ul style="list-style-type: none"> National Department of Environmental Affairs Gauteng Department of Agriculture and Resource Development Local Authorities 	There is no requirement for a noise permit in terms of the legislation.
National Heritage Resources Act (Act No. 25 of 1999)	<ul style="list-style-type: none"> S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including: <ul style="list-style-type: none"> * The construction of a road, powerline, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; * Any development or other activity which will change the character of a site exceeding 5 000 m² in extent 	<ul style="list-style-type: none"> South African Heritage Resources Agency 	<ul style="list-style-type: none"> The proposed pipeline exceeds 300m in length. A Heritage Assessment has been undertaken as part of this Basic Assessment Due to the density of the urban development in the region, it is very unlikely that any sites or features dating to the pre-colonial history of the region would still exist in the study area. However, isolated objects such as Stone Age artefacts might be exposed in areas close to stream beds.

<u>Title of legislation, policy or guideline (Promulgation Date)</u>	<u>Applicable Requirements</u>	<u>Administering Authority</u>	<u>Description of compliance</u>
National Environment Management Protected Areas Act, 2003 (Act No. 57 of 2003).	<ul style="list-style-type: none"> Wetlands and other critical Biodiversity areas are regulated under the NEM:BA. Activities that fall within the parameters of these areas require specialist assessment to determine the impacts and the residual effects of mitigation measures 	» National Department of Environmental Affairs	<ul style="list-style-type: none"> No permitting requirements were triggered by the activities.
Conservation of Agricultural Resources Act (Act No 43 of 1983).	<p>Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:</p> <ul style="list-style-type: none"> <u>Category 1 plants</u>: are prohibited and must be controlled. <u>Category 2 plants</u>: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. <u>Category 3 plants</u>: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands. 	» Department of Agriculture, Forestry and Fisheries (DAFF)	<ul style="list-style-type: none"> An alien species management plan to be included in the requirements of the EMPr.
Occupational Health and Safety Act (No 85 of 1993)	The Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.	» Department of Labour	<ul style="list-style-type: none"> The EMPr provides for measures to ensure that objectives of the Act are met on this site

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

Provide a description of the alternatives considered

Table 3: Description of the alternatives considered

Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	Description
Site Alternatives	<p>No site alternatives have been investigated for the proposed development for the following reasons:</p> <p>The main objective of this project is to replace the existing 110mm, 160mm and 200mm AC pipes and associated appurtenances in Vorna Valley Ext. 4. It was determined by infrastructure planning of Johannesburg water that the pipe has reached it useful life, there the pipe needed to be replaced.</p> <p>Thus the identified site is the <u>only one site is deemed feasible</u> and practicable for the proposed development.</p>
River Crossing Technology Alternatives	<p>Proposed Alternative: Pipeline mounted onto existing culvert</p> <p>Due to limited servitude where the pipes are crossing the streams the two pipes make it difficult to do maintenance and it is recommended that they be replaced with a single diameter pipe. Where the pipes are crossing the stream, the proposed pipes will be mounted to a culvert above the stream and will be supported on both ends and throughout the pipeline. The river will not be disturbed thus works will not affect the river as shown on the illustration below.</p>  <p>Pipeline mounted onto culvert</p> <p>Alternative 1: Trenchless Method</p> <p>Maintaining the existing alignment of the pipe; the pipeline will be installed using trenchless method of</p>

construction i.e. **Horizontal Drilling/Pipe Cracking**. The pipeline will be installed under the river bed whereby there will be two pits opened on either side of the stream for the launching and reception pits.

Preferred alternative selection: Currently the existing runs underneath the river bed. The space between the road and edge of the bridge is less than 1m wide and about 400mm deep. Base on the info above, JHB Water is not going to have enough cover for the pipe; cars can easily damage the new pipe. The pipe cracking method requires the use HDPE pipe; JHB water design guideline does not allow us to use HDPE material for water projects. If steel pipe are laid underneath the river bed, the river bed will be disturbed and in future if access to the pipe underneath the river bed is needed, it will be difficult to do maintenance on it. When the pipe is mounted to the bridge no car or any persons will damage easily damage it, it will cost less to maintain it compared to disturbing the river bed and banks. **The proposed Alternative (Culvert Mounted) is preferred method of river crossing**

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

N/A

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	
Alternatives:	
Alternative 1	
Alternative 2 (if any)	
	Ha/ m ²

or, for linear activities:

	Length of the activity:
Proposed activity	970m
Alternatives:	
Alternative 1	
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	350m ²
Alternatives:	
Alternative 1	
Alternative 2 (if any)	
	Ha/m ²

5. SITE ACCESS

Proposed activity

Does ready access to the site exist, or is access directly from an existing road?

YES	

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

Describe the type of access road planned:

The site is easily accessible via the local residential roads as shown in **Figure 2**. The pipeline infrastructure are mostly located on the road reserve, there is therefore direct road access. Where the network is located on a watercourse, these parts of the pipes will have to be accessed by excavation.

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).



Figure 2: Overview of existing access roads to the site and the two river crossings indicated as

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?

YES	
	m

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

Describe the type of access road planned:

Same as for the Proposed Activity.

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 (Not Applicable)

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
m	

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).

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

Section A 6-8 has been duplicated Number of times (only complete when applicable)

6. LAYOUT OR ROUTE PLAN

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)

The layout plan for the proposed development are enclosed within Appendix A

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.

The **Locality Map** for the proposed development are enclosed within **Appendix A**

7. SITE PHOTOGRAPHS

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.

Reference is made to **Appendix B – Site Photographs** included as part of this application

8. FACILITY ILLUSTRATION

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.

Reference is made to **Appendix C – Facility Illustration** included as part of this application

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

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.

1. Indicate on a plan(s) the different environments identified
2. Complete Section B for each of the above areas identified
3. Attach to this form in a chronological order
4. Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.
5. the next page.

Section B has been duplicated for sections of the route 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 alternative 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 times (complete only when appropriate)

It is worth noting that both design alternatives of river crossings as discussed in Section A (3) are proposed in the same receiving environment and therefore will be assessed together as impacts will be similar. It is for this reason that the section will not be duplicated.

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.)

The proposed pipeline is to be constructed along Le Roux Avenue in Vorna Valley, Midrand. The alignment is to be constructed mostly along the road reserves on the following properties:

FARM/ERF NUMBER	PORTION	SG CODES
WATERVAL 5 IR	152	T0IR00000000000500152
ERF 740 IN VORNA VALLEY	0	T0IR09520000074000000
ERF 741 IN VORNA VALLEY	0	T0IR09520000074100000

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.

Proposed Activity:
Centre point of the activity

Latitude (S):	Longitude (E):

In the case of linear activities:

Proposed Activity:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):	Longitude (E):
26° 1'43.10"S	27°58'28.34"E
26° 0'55.05"S	27°58'34.82"E
26° 0'16.27"S	27°58'35.60"E

Alternative 1

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):	Longitude (E):

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. Please refer to **Appendix D** for the co-ordinates taken at every 250 meters

Addendum of route alternatives attached **YES**

The 21 digit Surveyor General code of each cadastral land parcel

FARM/ERF NUMBER	PORTION	SG CODES
WATERVAL 5 IR	152	T0IR00000000000500152
ERF 740 IN VORNA VALLEY	0	T0IR09520000074000000
ERF 741 IN VORNA VALLEY	0	T0IR09520000074100000

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Proposed Activity

Flat	1:50 – 1:20 ✓	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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4. LOCATION IN LANDSCAPE

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

Proposed Activity

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
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5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

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

c) are any caves located within a 300m radius of the site(s) 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):
o	o

d) are any sinkholes located within a 300m radius of the site(s) 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):
o	o

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

Hydrology

As per existing spatial layers, the pipeline traverses two unnamed tributaries of the Jukskei River. The two water crossings are henceforth referred to as the northern and southern water crossing (**Figure 3**).

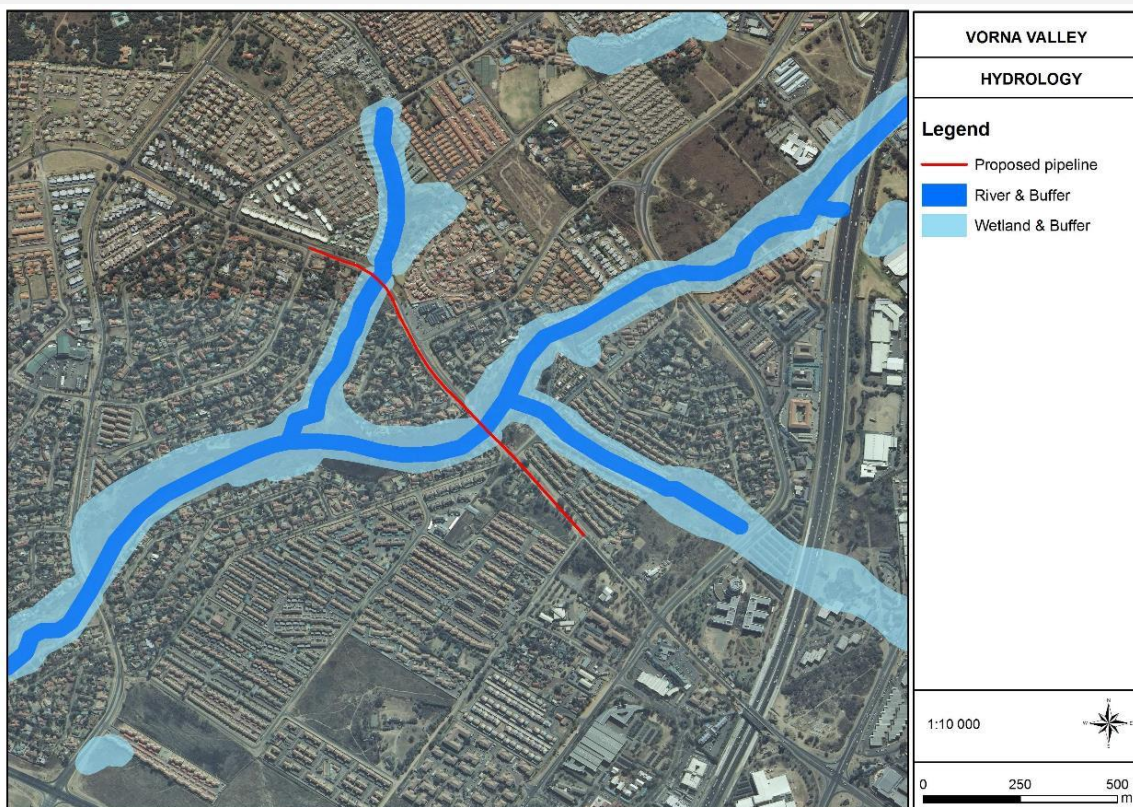


Figure 3: Regional hydrology

Geology and Soils

Archaean granite and gneiss of the Halfway House Granite underlies the entire study site (GDACE, 2002). This formation dates back to the Basement Complex that was formed close to the origin of the earth (approximately 4,600 to 2,500 million years ago). The basement complex acts in the same way as the shales. The shales are the most permeable of rock types, and water moves easily through them, becoming trapped above the intrusions. Groundwater recharge, such as seeps and springs, occurs on the slope face at the contact between the highly weathered shale and the impermeable layers. The soil of the area is summarised in the table and figures (**Figure 4**)

Soil Name	Description	Relation to wetlands
U	Urban Technosols	Hydric technosols can occur when natural or polluted water saturated anthropogenic material (Stilfontein) (SCWG, 2018)
sGs15	Shallow (300-600mm), brown/greyish brown coarse sand/loamy sand with weak blocky structure, non-calcareous	None

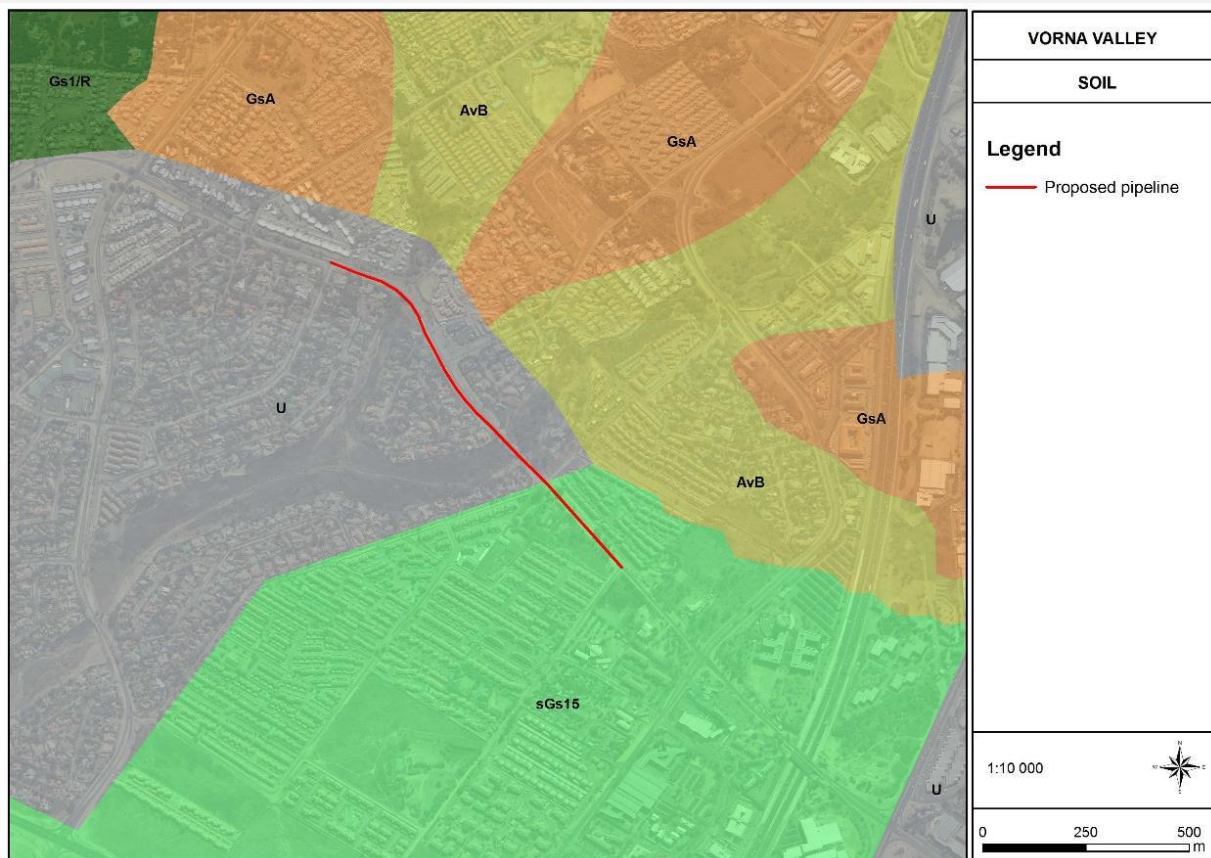


Figure 4: Soils of the study area.

Areas sensitive to erosion

Soil characteristics along the watercourse crossings reflected the urban and highly transformed nature of the area. Soils along Le Roux Road can be described as Technosols (following the definition in SCWG, 2018). These are

soils associated with material from mining, industrial, construction or urban activities that supply parent material for new anthropogenic soils. This results in physical, chemical and hydrological changes in natural soils so that their inherent function differs substantially from that of the natural state.

To a depth of 50cm below the surface, soil samples along the edges of the watercourse reflected transported material associated with road building. This soil was sandy, unstructured, orange and relatively compacted. In the watercourse, the upper layer of soil was dark, orthic with higher organic content although alluvium or transported material was found, maybe transported from upstream erosion gullies. Subsoil was gleyed with rubble in some instances.

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?



According to the Gauteng Agricultural Potential Atlas (GAPA) the site falls mostly within an area of VERY LOW agricultural potential as depicted in **Figure 5** below.

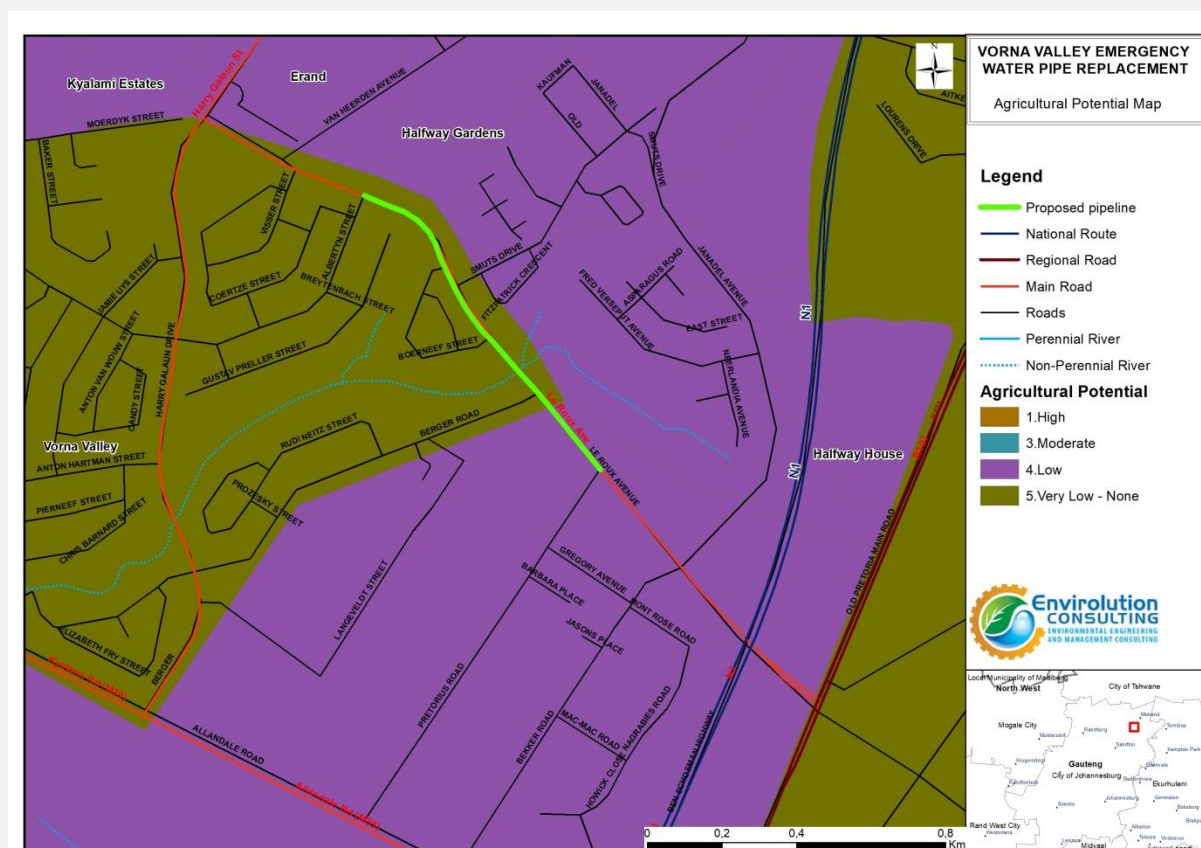


Figure 5: Agriculture potential Map for the study area

Please note: The Department 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 % = 0	Natural veld with scattered aliens % = 0	Natural veld with heavy alien infestation % =2	Veld dominated by alien species % =0	Landscaped (vegetation) % =10
Sport field % =0	Cultivated land % =0	Paved surface (hard landscaping) % =85	Building or other structure % =0	Bare soil % =3

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 ✓

If YES, specify and explain:

Vegetation: The riparian vegetation provide suitable habitat to at least five (5) of these species. However, none was recorded at the crossings. These species may occur up- or downstream of the crossings, although the vegetation is likely too disturbed or invaded by alien species to support them.

Fauna: The study site falls inside the natural range of the coppery grass lizard, but the site is disturbed. A small possibility exists that the coppery grass lizard occurs on this particular study site.

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 ✓

If YES, specify and explain:

Vegetation: The riparian vegetation provide suitable habitat to at least five (5) of these species. However, none was recorded at the crossings. These species may occur up- or downstream of the crossings, although the vegetation is likely too disturbed or invaded by alien species to support them.

Fauna: The study site falls inside the natural range of the coppery grass lizard, but the site is disturbed. A small possibility exists that the coppery grass lizard occurs on this particular study site.

Are there any special or sensitive habitats or other natural features present on the site?

YES ✓

If YES, specify and explain:

Wetland

The proposed pipeline upgraded lies across two branches of a watercourse that feeds into the Jukskei River approximately 2.7km to the west of the site. A small tributary enters this system from the south east. The easternmost sections of the watercourses are classified as riparian with slower energy wetland conditions occurring on the western section, predominantly west of Le Roux Avenue (**Figure 6**)

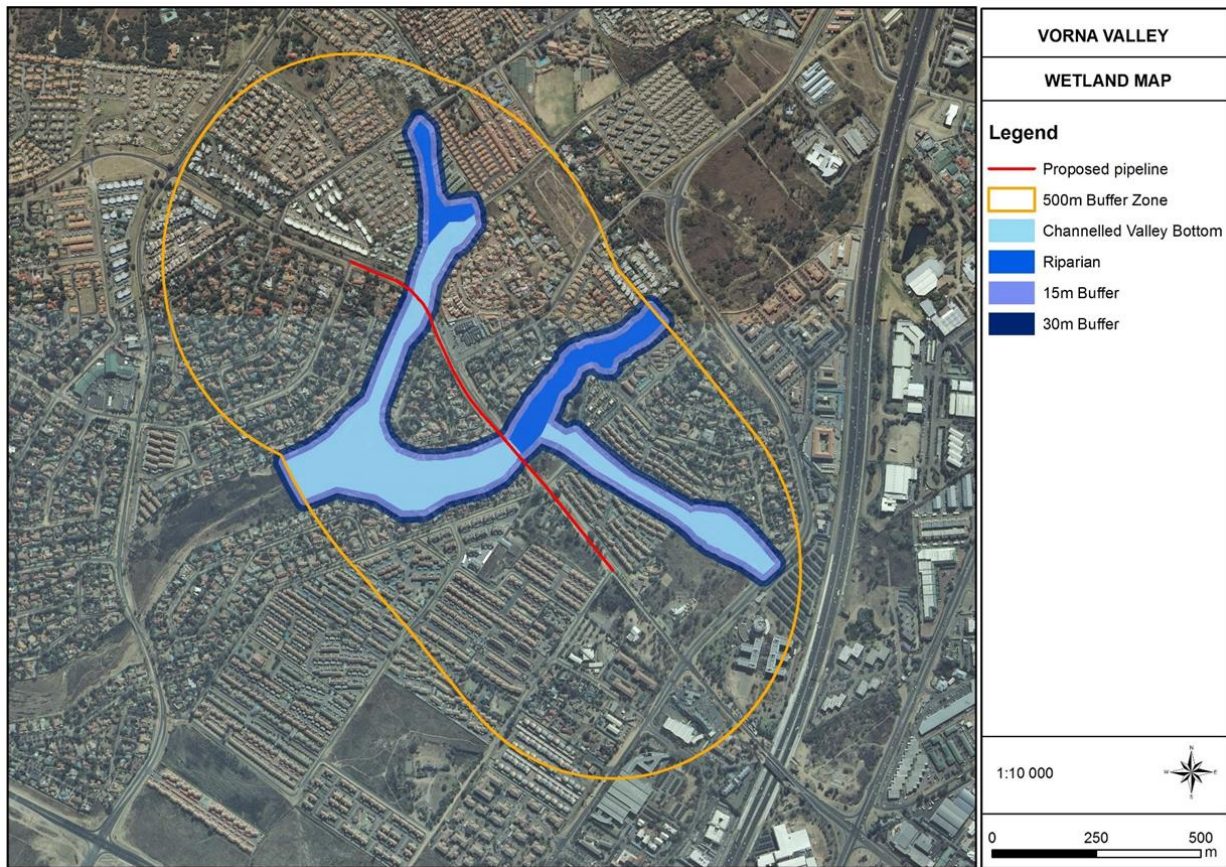


Figure 6: Wetland map indicating the wetlands and associated buffer zones of the study site

Wetland Functionality, Status and Sensitivity

Since 2009 wetland conditions have deteriorated in most sections of the wetland system. In particular, erosion and canalization have increased. This is a result of high energy stormwater input which reflects the changes to hillslope hydrology and the loss of opportunity for water to infiltrate the soil layer, and particularly the plinthic and saprolite layers. A tremendous increase in the energy of water flow together with highly erodible soils result in serious changes to wetlands and also a cumulative negative effect to the Jukskei River which is already highly impacted.

Input of pollutants in the form of hydrocarbons is also expected to have increased as this is a natural consequence of the high density of roads and parking areas in the catchment. Overall scores show that the wetland system in Vorna Valley is in a critical condition and no longer provides many services it would have provided in its reference state, including water energy attenuation, sediment trapping and support of high biodiversity.



Figure 7: General vegetation characteristics of the wetlands at Le Roux Road at the northern (top) watercourse crossing and southern (bottom) watercourse crossings.

In terms of the Ecological Importance and Sensitivity (EIS), The channelled Valley bottom wetland **scored a 0.9**. This score falls into the **Low category** which is characterised by wetlands that are considered to be not ecologically important and sensitive at any scale. The biodiversity of these wetlands is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water in major rivers

The result of the Present Ecological State (PES) assessment indicates that the **PES score** for the channelled valley bottom wetland falls in the **Low category**. In this category, the change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable

Vegetation Sensitivity

Vegetation associations identified during this study are based on the overall similarity in vegetation structure, species composition, and abiotic features such as moistness or rocky areas. The vegetation that will be impacted on by the replacement pipeline was mostly modified from the reference state of Egoli Granite Grassland, while the vegetation associated with the watercourse included a high number of alien and invasive plant species.

Vegetation was mapped within 20 meters on either side of the pipeline route (**Figure 8**). The vegetation was grouped as follows:

1. Riparian vegetation;
2. Modified grassland; and
3. Modified: no natural vegetation remaining (built-up) or mowed lawns.



Figure 8: Vegetation associations along the route (mapped to 20m on either side of the route).



Figure 9: Sensitivity Map (mapped to 20m buffer around the site)

Medium-high: riparian

The riparian vegetation included a high number of alien and invasive plant species. However, some indigenous species remain, as well as suitable habitat for plant species of conservation concern. Although the species composition, and likely the structure, has been modified, the riparian vegetation is essential to maintain ecological corridors for the movement and survival of species within a landscape fragmented by urbanisation. In addition, the hydrological processes associated with these ecological features are closely associated with the intactness of the vegetation. The vegetation plays an important role in flood attenuation, prevent soil erosion and sedimentation of wetlands and pans and promote the uptake of toxins from the water. The riparian vegetation sensitivity rating is based on its functional role, as well as the statutory protection of watercourses.

Low-medium mowed grassland

Modified grasslands flank the riparian areas. Although the species composition of these grasslands are not representative of the Egoli Granite Grassland, the function of the grasslands aids the health and functioning of the watercourses. The vegetation is classified as low-medium sensitivity to the proposed pipeline replacement. From a vegetation perspective, these areas should not be impacted on by the construction, particularly camps and storage of equipment, as it could result in negative effects on the proximate watercourse.

Gauteng Conservation Plan

According to the Gauteng Conservation Plan (version 3.3) (Cplan), the pipeline traverses CBA: Important Areas, as

well as ESA's (**Figure 10**). These areas are mostly centred around the watercourses that are traversed by the pipeline, as well as remnant open spaces in the otherwise urbanised environment. Both the CBA and ESA within the study area provide suitable habitat to a number of threatened plant species and were the main areas assessed for this report.

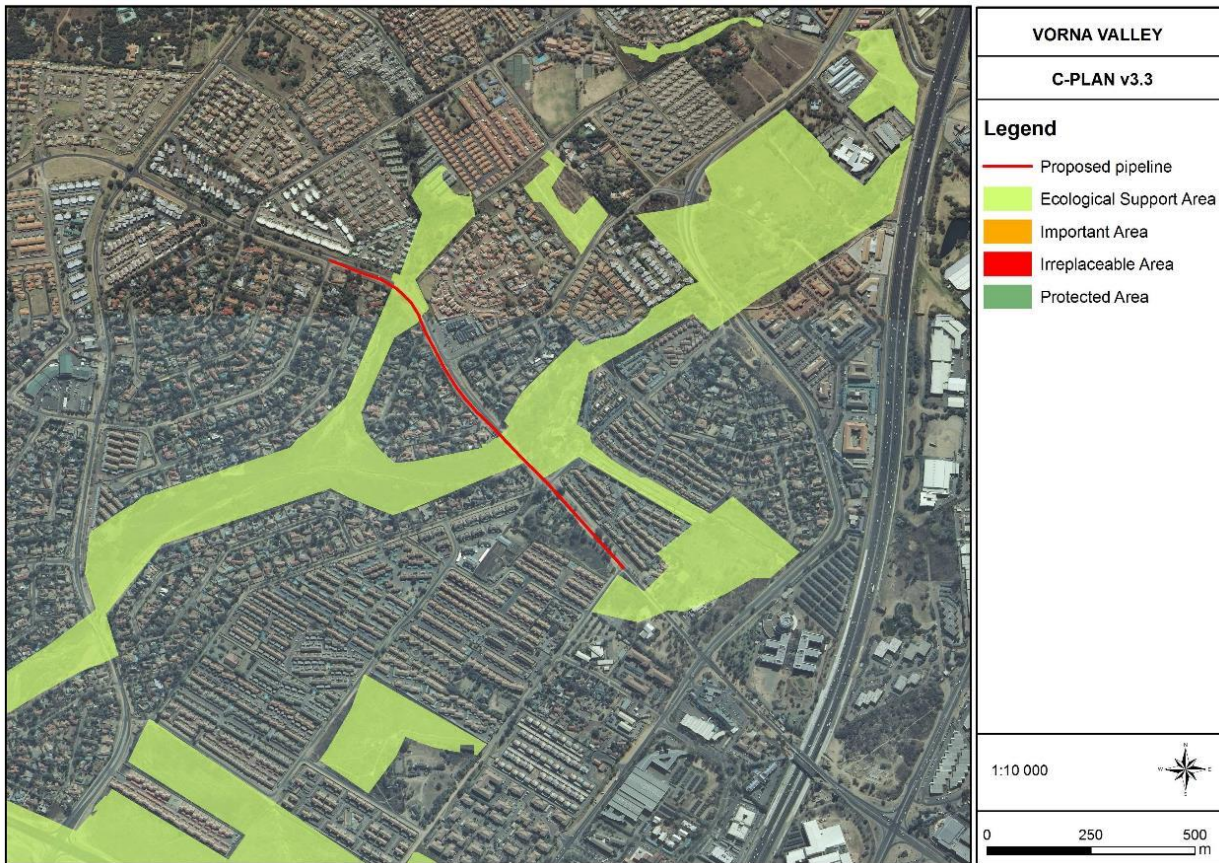


Figure 10: The pipeline route in relation to the Gauteng Conservation Plan.

YES ✓

Was a specialist consulted to assist with completing this section
If yes complete specialist details

1.) Wetland Specialist

Name of the specialist:

Antoinette Bootsma

Qualification(s) of the specialist:

- MSc Ecology, University of South Africa (2017) Awarded with distinction. Project Title: Natural mechanisms of erosion prevention and stabilization in a Marakele peatland; implications for conservation management
- Short course in wetland soils, Terrasoil Science (2009)
- Short course in wetland delineation, legislation and rehabilitation, University of Pretoria (2007)
- B. Sc (Hons) Botany, University of Pretoria (2003-2005). Project Title: A phytosociological Assessment of the Wetland Pans of Lake Chrissie
- B. Sc (Botany & Zoology), University of South Africa (1997 - 2001)

Postal address:

Postal code:

Telephone:

E-mail:

	Cell:	+27 83 4545 454
	Fax:	

antoinette@limosella.co.za

NO ✓

Are any further specialist studies recommended by the specialist?

If YES, specify:

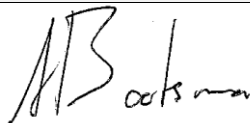
Yes

If YES, is such a report(s) attached?

NO ✓

If YES list the specialist reports attached below

Signature of specialist:



Date:

December 2018

2.) Heritage Specialist

Name of the specialist:

J van Schalkwyk

Qualification(s) of the specialist:

J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 30 years. Based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 60 papers, many in scientifically accredited journals.

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62 Coetzer Avenue, Monument Park, 0181

Postal code:

2194

Telephone:

Cell: 076 790 6777

E-mail:

jvschalkwyk@mweb.co.za

Fax:

NO ✓

Are any further specialist studies recommended by the specialist?

If YES, specify: N/A

If YES, is such a report(s) attached? NO ✓

If YES list the specialist reports attached below

N/A

Signature of specialist:  Date: December 2018

3.) Flora Specialist

Name of the specialist: Antoinette Eyssell-Knox

Qualification(s) of the specialist:

- M.Sc Environmental Science, University of Pretoria (2010)
Dissertation: *Land cover change and its effect on future land uses*
- B. Sc (Hons) Horticulture, University of Pretoria (1999-2000)
Dissertation: *Horticultural uses of the indigenous Barleria species*
- B. Sc (Agriculture) Horticulture, University of Pretoria (1993-1996)

Postal address:

Postal code:

Telephone: 082 642 6295 Cell: 082 642 6295

E-mail: Antoinette@dimela-eco.co.za Fax:

Are any further specialist studies recommended by the specialist? NO ✓

If YES, specify: N/A

If YES, is such a report(s) attached? NO ✓

If YES list the specialist reports attached below

N/A

Signature of specialist:  Date: December 2018

4.) Fauna Specialist

Name of the specialist: Ignatius Lourens Rautenbach

Qualification(s) of the specialist:

- hold higher degrees in the biological sciences, which allowed registration by S.A. Council for National Scientific Professions (SACNASP) as Professional Zoologists that sanction us to function independently as specialist scientific consultants;
- declare that as per prerequisites of the Natural Scientific Professions Act No. 27 of 2003 this project was our own work from inception and reflects exclusively our observations and unbiased scientific interpretations, and executed to the best of our abilities;
- abide by the Code of Ethics of the SACNASP;
- are committed to biodiversity conservation but concomitantly recognize the need for economic development. Whereas we appreciate opportunities to learn through constructive criticism and debate, we reserve the right to form and hold our own opinions within the constraints of our training, experience and results and therefore will not submit willingly to the interests of other parties or change our statements to appease or unduly benefit them;

Postal address:

45 Helgaard Street, Kilner Park, Pretoria

Postal code:

0186

Telephone:

012 3334112

Cell:

082 3351288

E-mail:

naasrauten@mweb.co.za

Fax:

[REDACTED]

NO ✓

Are any further specialist studies recommended by the specialist?

If YES,

N/A

specify:

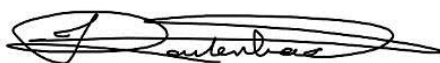
If YES, is such a report(s) attached?

NO ✓

If YES list the specialist reports attached below

N/A

Signature of specialist:



Date:

December 2018

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

Proposed Activity:

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	35 Other land uses (describe):

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

Site 

NORTH					
	9	25	25	25	9
	9	9	9	2,25	9
Note:	1, 9	2	12, 13	9	25
WEST	9, 18	9,14		1, 9	9
	9	2, 9	9,14	1, 2,	9
	9	9	9	9,14	9
	SOUTH				
	EAST				

The pipeline route aligns with existing Le Roux Avenue through Vorna Valley. The busy road is flanked by residential and commercial properties. The road servitude is up to 12m wide and includes mowed lawns, walkways and planted trees (e.g. *Searsia lancea*). The pipeline will also traverse sidewalks and road verges that comprise little to no vegetation.

More than one (1) Land-use may be indicated in a block

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 ✓

If yes indicate the type of reports below

- Vegetation Assessment
- Fauna Impact Assessment
- Wetland Assessment & Wetland Rehabilitation Plans
- Heritage Assessment

The above specialists reports are attached within **Appendix G** of this report

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 project is located in **Region A** of the City of Johannesburg (CoJ) within Ward 23, the following socio-economics characteristics are pertinent to the site:

Population: Understanding both the age as well as anticipated population growth of the city assists in planning for the anticipated demand for services and job opportunities. The CoJ has a population of approximately 4 million made up primarily of a young population aged between 30 and 39 years. This total population translates into roughly 1.3 million households. The city's population is projected to increase to about 4.1 million in 2015 implying an annual rate of growth of the population of about 1.3% per annum by 2015. Household projections further indicate that the number of households in the City is likely to increase from about 1.3 million in 2010 to about 1.5 million in 2015 with an average household size of about 3 persons. The region is home to more than 250 000 residents, most of whom are concentrated in Midrand. The western part of the region is scarcely populated, though some 56 000 people reside in the township of Diepsloot alone (CoJ, 2018), ward is made up of 35 205 inhabitants.

Economic Profile of local Municipality: The City' of Johannesburg` s economy is driven primarily by four economic sectors which are: (a) finance and business services, (b) community services, (c) manufacturing, and (d) trade. These four economic sectors collectively account for more than 82% of economic activity within the City.

Level of Unemployment: The CoJ had high unemployment levels of 23.1% in 2010/2011. Regions E, B have one of the lowest rates of unemployment at 2.3% and 9.2% respectively. Youth unemployment remains a major challenge both nationally and for the city. Low education levels and slow formal sector growth are two of the major causes of youth unemployment. The vast majority of the youthful population in Johannesburg has only a matric certificate preventing access to the labour market (CoJ IDP 2012/2016).

Provision of Basic Service: The provision of (and access to) basic services such as electricity, water, adequate sanitation, etc. is critical for the pathway to poverty reduction, and to some extent, inequality – as these have an impact on the quality of life. Access to basic services is relatively high in Johannesburg (with over 95% of households enjoying access to piped water, flush toilets, and electricity); however, there is still a significant proportion of the population without the capacity / means to access or optimally benefit from these services. This could be attributed to increasing inward migration, rapid urbanisation, and the associated growth in the number of households which require services. It is also important to bear in mind that chronically poor households find it difficult, and often cannot pay for basic services.

https://www.joburg.org.za/documents /Documents/Issue%20_The%20Socio%20Economic%20Status%20of%20the%20City%20of%20Johannesburg.pdf

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 categorized as-
- (a) the construction of a road, wall, power line, 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?

	NO ✓
--	-------------

If YES, explain:

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:

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of very limited Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component, which eventually gave rise to an urban component. As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development.

From a heritage point of view, it is recommended that Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Will any building or structure older than 60 years be affected in any way?
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

	NO ✓
	NO ✓

If yes, please attached the comments from SAHRA in the appropriate Appendix

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 ✓

If yes, has any comments been received from the local authority?

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.

The Draft Report will be submitted to the City of Johannesburg (CoJ) for comment. If any issues and comments are received, these will be collated and responded to. These responses will be incorporated into the Final BAR. The Public Participation Process is currently underway. Once concluded, the issues and comments raised by I&AP will be collated and responded to. These responses will be incorporated into the Final BAR.

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?

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 Report will be circulated to all stakeholders for comment during the review period. If any issues and comments are received, these will be collated and responded to. These responses will be incorporated into the Final BAR. The Public Participation Process is currently underway. Once concluded, the issues and comments raised by I&AP will be collated and responded to. These responses will be incorporated into the Final BAR.

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 authorization 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 to I&APs

Appendix 3 – Proof of newspaper advertisements

Appendix 4 –Correspondences with I&APs

Appendix 5 – Minutes of any public and/or stakeholder meetings – **this is anticipated during the Draft BAR review period**

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report - **Comments are anticipated during the Draft BAR review period**

Appendix 8 –Comments from I&APs on amendments to the BA Report **N/A**

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 alternative 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 times

(Complete only when appropriate)

Section D Alternative No. (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?

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

YES ✓	
Could not be determined at this stage	

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

Some construction rubble/ solid waste will arise from demolition of existing building. This solid waste will be temporarily stored on site in designated waste skips or stockpiles and then reused where possible for backfill. Surplus material will be removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr.

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

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

Will the activity produce solid waste during its operational phase?

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

YES ✓	
<input style="width: 80%; border: none;" type="text" value=""/> m ³	

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

Some construction rubble/ solid waste will arise from demolition of existing building. This solid waste will be temporarily stored on site in designated waste skips or stockpiles and then reused where possible for backfill. Surplus material will be removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr.

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?

	NO ✓
--	------

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

During both construction and operation phase a registered landfill sites within the study area can be used as they still have capacity.

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? 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? 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:

During Construction, wastes must be separated at source into recyclable and non-recyclable materials and distributed for recycling where applicable. During the construction phase, construction waste rubble should be re-used as fill material, erosion protection and gabion construction where possible. The re-use of construction waste materials will minimize the amount of waste that will need to be disposed of at registered municipal waste facilities. In addition, there will be extensive earthworks, but import and export of material will be minimised by balancing cut and fill requirements as far as possible.

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? NO ✓
 If yes, what estimated quantity will be produced per month? N/A m3
 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 onsite? NO ✓
 If yes, what estimated quantity will be produced per month? N/A m3

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

N/A

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? NO ✓
 If yes, provide the particulars of the facility:

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

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

N/A

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal NO ✓

sewage system?

YES	NO

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

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

Will the activity produce any effluent that will be treated and/or disposed of onsite?

YES ✓	
--------------	--

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

Chemical toilets are going to be used and the sewage waste will be collected by the Contractor on for treatment at a treatment facility.

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?

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:

During construction, there will be localized liberation of dust due to excavations and the hauling of materials around the site. Localised exhaust emissions will also occur, however a significant increase in concentrations of hydrocarbons, nitrogen oxides and carbon monoxide is not anticipated. During the operation phase there is likely to be localised petrol fumes in the immediate vicinity of the fuel pumps as is characteristic of a typical filling station. Increased emissions may occur due to increased traffic in the vicinity of the filling station

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 process itself will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

	litters
--	---------

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 ✓	
--------------	--

If yes, list the permits required

The pipeline will be crossing a watercourse. It is for such reasons that a Water Use License application process has been initiated for the development. According to the National Water Act (NWA), 1998 (Act No.36 of 1998), the proposed development requires a Water Use License as per the following regulations:

- Section 21(c): impeding or diverting the flow of water in a watercourse and;
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.

If yes, have you applied for the water use permit(s)?

YES ✓	

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

A pre-application for the submission the WULA has been initiated with the DWS (please refer to Appendix E for correspondence).

3. POWER SUPPLY

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

The development will not require power supply during its operation phase. However generators will be used as a source of power if needed during the construction phase.

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

Please see above.

4. ENERGY EFFICIENCY

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

In other activities (construction and operation) the scope of work will be structured in a way that, where possible, the use of labour intensive methods will be employed. Not only will it serve the local community but it also saves the use of Pneumatic Equipment that requires a lot of energy input.

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

The proposed development is not an energy-intensive development that will require energy/electricity input for its continued operations and will therefore not consume energy during its operation phase.

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

Summaries the issues raised by interested and affected parties.

The PPP is currently underway. Once concluded, the issues and comments raised by I&AP will be collated and responded to. These responses will be incorporated into the Final BAR.

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):

The PPP is currently underway. Once concluded, the issues and comments raised by I&AP throughout the process will be collated and responded to accordingly. These responses will be incorporated into the Final BAR for submission to GDARD for review and decision-making.

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

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

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

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

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

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
 - * The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate with
 - * a score of 1 being site specific,

- * 2 = local (site + immediate surrounds),
- * 3 = regional (the impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns),
- * 4 = national and
- * a score of 5 being international (where the impact has international ramifications that extend beyond the boundaries of South Africa).

- The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4; or;
 - * Permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

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

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

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

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 and OPERATION PHASE** for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

2.1 IMPACTS THAT MAY RESULT FROM THE **CONSTRUCTION PHASE**

Table 4: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that is likely to occur as a result of the **CONSTRUCTION PHASE** for the proposed **Mounted Pipeline on Culvert and Trenchless methods for river crossing**

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
IMPACT ON WATERCOURSES																							
<p>Nature of the Impact: <u>Changes in water flow regime impact ratings</u></p> <ul style="list-style-type: none"> Since the pipes will be mounted to the culvert, this assessment assumes that the footprint of the construction activities will be limited to the existing road and reserve. Since no vehicles will encroach onto the bed and banks of the watercourse, nor will the stream need to be diverted, <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td>Extent</td> <td>Regional (3)</td> <td>Limited to Local Area (2)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>39 (moderate)</td> <td>16 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Long term (4)	Short term (2)	Extent	Regional (3)	Limited to Local Area (2)	Magnitude	Moderate (6)	Low (4)	Significance	39 (moderate)	16 (low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> No construction should take place in watercourses under wet conditions unless there is an emergency with safety implications or environmental impacts. Minimise the footprint of activities in the wetland and buffer zone by preventing unnecessary access of vehicles and personnel Effective rehabilitation should be conducted as specified in a detailed, site specific rehabilitation plan should any activities encroach onto the wetland or its buffer zone Where necessary, corrective action should be determined by a team of specialists including engineers, hydrologists and ecologists 	<p>Some changes in the hydrology of the wetlands could occur if construction activities need to extend into the wetland or its buffer zone</p>
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Long term (4)	Short term (2)																					
Extent	Regional (3)	Limited to Local Area (2)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	39 (moderate)	16 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																		
<p>Nature of the Impact: <u>Changes in sediment entering and exiting the system</u></p> <p>Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount). Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation although this will be limited to areas outside the wetland and its buffer if construction remains limited to the existing road. Mitigation measures below are relevant to borrow pits and construction activities upslope from the wetland where sediment may be washed into the wetland. These include:</p> <ul style="list-style-type: none"> • Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. • Disturbance of soil surface, including establishment of the crew camp. • Disturbance of slopes through creation of roads and tracks adjacent to the watercourse Erosion (e.g. gully formation, bank collapse)) <table border="1" data-bbox="143 1129 748 1334"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Long term (4)</td> <td>Medium term (3)</td> </tr> <tr> <td>Extent</td> <td>Regional (3)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>39 (moderate)</td> <td>18 (low)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Long term (4)	Medium term (3)	Extent	Regional (3)	Local (2)	Magnitude	Moderate (6)	Low (4)	Significance	39 (moderate)	18 (low)	<ul style="list-style-type: none"> • Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses. • Ensure that crew camps are located outside of the wetland or its buffer zone and establish effective sediment control measures, for example hay bales down slope of stockpiles • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. • Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. • Maintain buffer zones to trap sediments • Monitoring should be done to ensure that sediment pollution is timeously dressed 	<p>Moderate to high since reversing sediment pollution is unlikely to be effective and may cause more damage</p>
Description	Without Mitigation	With Mitigation																		
Probability	Probable (3)	Possible (2)																		
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Magnitude	Moderate (6)	Low (4)																		
Significance	39 (moderate)	18 (low)																		

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Introduction and spread of alien vegetation.</u></p> <ul style="list-style-type: none"> The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users. As for the potential impact associated with sedimentation, this potential impact is related to activities upslope from the watercourse rather than along the watercourse crossing itself, since it is expected that the construction footprint across the watercourse crossing will be limited to the existing road and its reserve. 			<ul style="list-style-type: none"> Implement an Alien Plant Control Plan and monitor for at least 3 years Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. Rehabilitate or revegetate disturbed areas 	Expected to be high due to large extent of exotic vegetation in the area.																					
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Status (positive, negative or neutral)	Negative	Negative																							

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>Nature of the Impact: <u>Loss and disturbance of wetland habitat and fringe vegetation.</u></p> <ul style="list-style-type: none"> Limiting construction activities to the existing road and reserve area will largely eliminate this possible impact. However, it is possible that some footprint on either side of the bridge, for example turning of heavy vehicles, or crew camps, may impact on wetland habitat or its buffer <table border="1" data-bbox="143 687 748 983"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Long term (4)</td> <td>Medium term (3)</td> </tr> <tr> <td>Extent</td> <td>Regional (3)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>39 (moderate)</td> <td>18 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Long term (4)	Medium term (3)	Extent	Regional (3)	Local (2)	Magnitude	Moderate (6)	Low (4)	Significance	39 (moderate)	18 (low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> Construction should not encroach onto the demarcated wetland or buffer. These no-go areas should be clearly marked and signposted 	<p>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation and control of alien species on the site is undertaken where necessary.</p>
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Long term (4)	Medium term (3)																					
Extent	Regional (3)	Local (2)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	39 (moderate)	18 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Changes in water quality due to foreign materials and increased nutrients.</u></p> <ul style="list-style-type: none"> Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/rivers and a reduction in watercourse function. <table border="1" data-bbox="143 1329 748 1355"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation				<ul style="list-style-type: none"> Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone. Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. Provision of adequate sanitation facilities located outside of the watercourse area or its associated buffer zone The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc. 	<p>Expected to be low as the pipeline transports clean water only</p>															
Description	Without Mitigation	With Mitigation																					

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented												
Probability	Probable (3)	Probable (3)														
Duration	Medium-term (3)	Short-term (2)														
Extent	Limited to Local Area (2)	Local (2)														
Magnitude	Moderate (6)	Low (4)														
Significance	33 (moderate)	24 (Low)														
Status (positive, negative or neutral)	Negative	Negative														
IMPACT ON VEGETATION																
<p>Nature of the Impact: <u>Clearing of vegetation, especially the modified grassland of low-medium sensitivity</u></p> <p>The may require the removal of some of the modified grassland that serve as catchment to the riparian vegetation. If these impacts are foreseen, it can be mitigated.</p> <p>The sources of this impact could include:</p> <ul style="list-style-type: none"> Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers; Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction. 			<ul style="list-style-type: none"> An independent Ecological Control Officer (ECO) should be appointed to oversee construction. A temporary fence or demarcation must be erected around the construction area to prevent access to adjacent vegetation. Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area or any natural areas outside of the construction footprint (e.g. modified grassland and watercourses). Only remove vegetation where absolutely necessary and retain vegetation in place for as long as possible prior to removal. Planning of the construction site must incorporate eventual rehabilitation (Figure 8). For pipelines, a servitude width of 15m should be permitted for machine excavation, and 6m for manual excavation, unless otherwise specified by the ECO. This working servitude must accommodate all construction related activities, including materials storage, access routes etc (DWAF, 2005). A vegetation rehabilitation plan should already be implemented during construction and include the following: The grassland that needs to be cleared along the entire route and particularly in proximity to the watercourses, can be removed as sods and stored within transformed vegetation or other disturbed areas. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed 													
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Description	Without Mitigation	With Mitigation														
Probability	Probable (3)	Improbable (2)														
Duration	Short term (2)	Short term (2)														
Extent	Site and surrounds (2)	Limited to Site (1)														

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented												
Magnitude	Moderate (6)	Low (4)	<p>areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.</p> <ul style="list-style-type: none"> Grasses that naturally occur in the area should be sown / hydroseeded in the disturbed footprint. Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. No activities should take place during rainy events and at least 2 days afterwards. Where topsoil needs to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation where applicable. Never mix topsoil with subsoils or other spoil materials. Maintain site demarcations in position until the cessation of construction work. 													
Significance	30 (medium)	14 (low)														
Status (positive, negative or neutral)	Negative	Negative														
<p>Nature of the Impact: <u>Destruction or degradation of riparian vegetation</u></p> <p>The construction of the pipeline will inevitably require the removal of or vegetation within and around the watercourse. This will impact on the health and functioning of the vegetation within the watercourse. Construction could also result in pollution of the watercourse.</p> <p>Although the pipeline is planned to be fixed to the existing culverts over the watercourse, trampling, degradation and destruction of some plants can be expected.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Highly probable (4)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Medium-term (3)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to local area (2)</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Highly probable (4)	Probable (3)	Duration	Medium-term (3)	Short-term (2)	Extent	Limited to Local Area (2)	Limited to local area (2)	<ul style="list-style-type: none"> The watercourse and associated buffer zones should be fenced during the construction phase to prevent any human activity from encroaching into these areas, other than that which is essential to the construction. Monitoring of the fences is important to ensure no infringement of the fences occurs. Construction within and around the watercourse should preferably take place during the dry winter months. Input of sediment during construction activities should be prevented at all cost. Mitigation for this potential impact includes establishment of vegetation as soon as possible after construction. Pollution of the surface and groundwater. Mitigation for this potential impact includes: <ul style="list-style-type: none"> In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs must be informed immediately; Store all litter carefully so it cannot be washed or blown into the water course; Construction vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants; A walled concrete platform, dedicated store with adequate flooring or bermed 	Erosion, pollution of the watercourse and invasion by alien invasive plant species.
Description	Without Mitigation	With Mitigation														
Probability	Highly probable (4)	Probable (3)														
Duration	Medium-term (3)	Short-term (2)														
Extent	Limited to Local Area (2)	Limited to local area (2)														

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Magnitude	High (8)	Moderate (6)	<p>area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas;</p> <ul style="list-style-type: none"> ○ Storage of potentially hazardous materials should be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, bitumen etc.; ○ Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils; ○ Concrete is to be mixed on mixing trays only, not on exposed soil; ○ Concrete and tar shall be mixed only in areas which have been specially demarcated for this purpose; ○ After all construction has been complete, waste construction material must be removed from the batching area and disposed of at an approved dumpsite; ○ All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring; Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage; ○ Under no circumstances may ablutions occur outside of the provided facilities; and ○ No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority. 	
Significance	52 (medium)	30 (medium)		
Status (positive, negative or neutral)	Negative	Negative		
<p>Nature of the Impact: <u>Potential increase in invasive vegetation</u></p> <p>The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site</p>			<ul style="list-style-type: none"> • Alien invasive species, in particular category 1b and category 2 wattle species that were identified on site must be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to 	Re-infestation in areas initially cleared.

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
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Description	Without Mitigation	With Mitigation																							
Probability	Highly probable (4)	Probable (3)																							
Duration	Long-term (4)	Short-term (2)																							
Extent	Local Area (2)	Site bound (1)																							
Magnitude	High (8)	Low (4)																							
Significance	56 (medium)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Exposure to erosion, sedimentation or pollution of proximate watercourses</u></p> <p>The removal of surface vegetation will expose the soils, which in rainy events would wash down into the watercourses, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive plant species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance vehicles could disturb rehabilitated areas which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern. The sources of this impact include:</p> <ul style="list-style-type: none"> Removal of vegetation in proximity to the watercourse, without proper rehabilitation or failure of rehabilitation; Access roads, especially on slopes, channels rainfall and causes 			<ul style="list-style-type: none"> During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation. Do not allow erosion to develop on a large scale before taking action. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). Runoff from road must be managed to avoid erosion and pollution problems. Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated (erosion management plan required) Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that indigenous vegetation cover is sufficient within one growing season. Due to the high degree of invasive species in the area, it is active rehabilitation e.g. hydroseeding is recommended, along with an alien invasive management plan. Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and 	Burst pipeline eroding surrounding soils and vegetation.																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>erosion;</p> <ul style="list-style-type: none"> Lack of rehabilitation or failed rehabilitation; Maintenance vehicles disturbing rehabilitated areas; Spillages of construction material and harmful chemicals; and Failure of rehabilitation of the construction footprint <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td>Duration</td> <td>Medium term (3)</td> <td>Short term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to the Site (1)</td> </tr> <tr> <td>Magnitude</td> <td>High (8)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td style="background-color: #ffff00;">39 (medium)</td> <td style="background-color: #90ee90;">14 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Medium term (3)	Short term (2)	Extent	Limited to Local Area (2)	Limited to the Site (1)	Magnitude	High (8)	Low (4)	Significance	39 (medium)	14 (low)	Status (positive, negative or neutral)	Negative	Negative	<p>work areas.</p> <ul style="list-style-type: none"> After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level. 	
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
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Extent	Limited to Local Area (2)	Limited to the Site (1)																					
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Significance	39 (medium)	14 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					
IMPACTS ON FAUNA (Terrestrial)																							
<p>Nature of the Impact: <u>Destruction of natural habitat</u></p> <p>Due to the modest nature of the undertaking, very little (if any) of the existing natural habitat will be destroyed. We do not know how the pipe sections will be handled, but there will be a measure of mechanisation involved, but over a limited period.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Short-term (2)	Short-term (2)	<p>Restrict construction activities to the smallest possible area of development site.</p>	<p>Low if construction activities are restricted to the smallest possible area of development site.</p>												
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Probable (3)																					
Duration	Short-term (2)	Short-term (2)																					

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
Extent	Limited to site (1)	Limited to site (1)																							
Magnitude	Low (4)	Low (4)																							
Significance	21 (low)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Destruction of sensitive vertebrate habitat</u></p> <p>We do not anticipate any permanent damage and we submit that over time no species will be negatively affected</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to site (1)</td> <td>Limited to site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>21 (low)</td> <td>21 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Short-term (2)	Short-term (2)	Extent	Limited to site (1)	Limited to site (1)	Magnitude	Low (4)	Low (4)	Significance	21 (low)	21 (low)	Status (positive, negative or neutral)	Negative	Negative	Nil.	Nil.
Description	Without Mitigation	With Mitigation																							
Probability	Probable (3)	Probable (3)																							
Duration	Short-term (2)	Short-term (2)																							
Extent	Limited to site (1)	Limited to site (1)																							
Magnitude	Low (4)	Low (4)																							
Significance	21 (low)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Loss of ecosystem function</u></p> <p>Construction poses the risk of interfering with ecosystem function, such as reduction in water quality and dispersal, soil pollution or underground water contamination.</p>			Restrict construction activities to the smallest possible area of development site.	Low if construction activities are restricted to the smallest possible area of development site.																					

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Description	Without Mitigation	With Mitigation		
Probability	Probable (3)	Probable (3)		
Duration	Short-term (2)	Short-term (2)		
Extent	Limited to site (1)	Limited to site (1)		
Magnitude	Low (4)	Low (4)		
Significance	21 (low)	21 (low)		
Status (positive, negative or neutral)	Negative	Negative		
Nature of the Impact: <u>Loss of the ecological function of wetland</u>			Runoff and spillages are to be contained.	Nil
Construction should not alter the landscape, influence the drainage processes or impact connectivity along the watercourse.				
Description	Without Mitigation	With Mitigation		
Probability	Probable (3)	Probable (3)		
Duration	Short-term (2)	Short-term (2)		
Extent	Limited to site (1)	Limited to site (1)		
Magnitude	Low (4)	Low (4)		
Significance	21 (low)	21 (low)		
Status (positive, negative or neutral)	Negative	Negative		
Nature of the Impact: <u>Poaching of wildlife in the vicinity</u>			• Education of the construction staff about the value of wildlife and environmental sensitivity.	Nil.

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>The site is marginally vulnerable to hunting/trapping by construction workers. Harassing and hunting by construction workers is deemed unlikely.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to site (1)</td> <td>Limited to site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>21 (low)</td> <td>21 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Short-term (2)	Short-term (2)	Extent	Limited to site (1)	Limited to site (1)	Magnitude	Low (4)	Low (4)	Significance	21 (low)	21 (low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> Restrict access to the suitable and sensitive habitats of faunal species. The contractor/contractors must ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance. 	
Description	Without Mitigation	With Mitigation																							
Probability	Probable (3)	Improbable (2)																							
Duration	Short-term (2)	Short-term (2)																							
Extent	Limited to site (1)	Limited to site (1)																							
Magnitude	Low (4)	Low (4)																							
Significance	21 (low)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
HERITAGE IMPACT																									
<p>Nature of the Impact: <u>Loss and disturbance of heritage sites due to the development.</u></p> <p>There are no heritages or archaeological resources identified at the project site. Therefore this impact will not be assessed further in this basic assessment report</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Low (1)</td> <td>Low (1)</td> </tr> <tr> <td>Duration</td> <td>Permanent (5)</td> <td>Permanent (5)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (1)</td> <td>Limited to Local Area (1)</td> </tr> <tr> <td>Magnitude</td> <td>Minor (8)</td> <td>Minor (8)</td> </tr> <tr> <td>Significance</td> <td>Low (8)</td> <td>Low (8)</td> </tr> <tr> <td>Status (positive,</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Low (1)	Low (1)	Duration	Permanent (5)	Permanent (5)	Extent	Limited to Local Area (1)	Limited to Local Area (1)	Magnitude	Minor (8)	Minor (8)	Significance	Low (8)	Low (8)	Status (positive,	Negative	Negative	<ul style="list-style-type: none"> Nonetheless, should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made. 	N/A
Description	Without Mitigation	With Mitigation																							
Probability	Low (1)	Low (1)																							
Duration	Permanent (5)	Permanent (5)																							
Extent	Limited to Local Area (1)	Limited to Local Area (1)																							
Magnitude	Minor (8)	Minor (8)																							
Significance	Low (8)	Low (8)																							
Status (positive,	Negative	Negative																							

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
negative or neutral)				
VISUAL IMPACTS				
Nature of the Impact: <u>Visual Impacts</u>			<ul style="list-style-type: none"> Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council. Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area; The landscape must be rehabilitated in such a way that it corresponds to the surrounding topography; Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighboring residents. In this situation low flux and frequency lighting shall be utilized. 	The risk is low provided the mitigation measures are implemented
Description	Without Mitigation	With Mitigation		
Probability	Probable (3)	Improbable (2)		
Duration	Short-term (2)	Short-term (2)		
Extent	Limited to Local Area (2)	Limited to Local Area (2)		
Magnitude	Medium (6)	Low (4)		
Significance	30 (Medium)	20 (Low)		
Status (positive, negative or neutral)	Negative	Negative		
NOISE IMPACTS				
Noise Impacts anticipated			<ul style="list-style-type: none"> Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only. If construction is required on the weekend; permission from adjacent landowners will be required prior to construction. No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc) must be used as per operating instructions and maintained properly during site operations. 	Noise pollution caused during construction could potentially be a nuisance to neighbouring residential areas. Health risk on the noise recipient if mitigation measures are not implemented.
Description	Without Mitigation	With Mitigation		
Probability	Probable (3)	Improbable (2)		
Duration	Short-term (2)	Short-term (2)		
Extent	Local (2)	Local (2)		
Magnitude	Moderate (6)	Moderate (5)		
Significance	30 (Moderate)	18 (Low)		
Status (positive or negative)	Negative	Negative		

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
SOCIAL IMPACTS																							
<p>Positive Social impacts anticipated during construction</p> <ul style="list-style-type: none"> • Employment Opportunities • Labour will be required for construction activities of the proposed development. It is therefore expected that jobs will be created during the construction period. • The construction labour requirements have not been estimated as yet. It is expected that much of the work will require mechanised construction methods because of the bulk of the works. However, there will also be a need for manual labour for construction. <table border="1" data-bbox="143 683 768 1011"> <thead> <tr> <th>Description</th> <th>Without Enhancement</th> <th>With Enhancement</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Highly Probable (4)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (6)</td> <td>High (8)</td> </tr> <tr> <td>Significance</td> <td style="background-color: #90EE90;">Low (24)</td> <td style="background-color: #FFD700;">48 (moderate)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Positive</td> <td>Positive</td> </tr> </tbody> </table>	Description	Without Enhancement	With Enhancement	Probability	Probable (3)	Highly Probable (4)	Duration	Short-term (2)	Short-term (2)	Extent	Local (2)	Local (2)	Magnitude	Moderate (6)	High (8)	Significance	Low (24)	48 (moderate)	Status (positive, negative or neutral)	Positive	Positive	<p>Enhancement:</p> <ul style="list-style-type: none"> • It is recommended that local employment policy is adopted to maximise the opportunities made available to the local labour force. • Where reasonable and practical JRA should appoint local contractors and implement a (local first) policy especially for semi-skilled and low skilled job categories. • Training and skills development programmes should be initiated prior to the commencement of the operation phase 	<p>The impact is positive; the only risk anticipated is not providing job opportunities to local people. Influx of workers looking for employment opportunities to the area.</p>
Description	Without Enhancement	With Enhancement																					
Probability	Probable (3)	Highly Probable (4)																					
Duration	Short-term (2)	Short-term (2)																					
Extent	Local (2)	Local (2)																					
Magnitude	Moderate (6)	High (8)																					
Significance	Low (24)	48 (moderate)																					
Status (positive, negative or neutral)	Positive	Positive																					
<p>Negative Social impacts anticipated during the construction period</p> <ul style="list-style-type: none"> • The increased dust resulting from construction activities (vegetation clearing, site preparation, earthworks, uncovered topsoil stockpiles and sand piles and loads on vehicles), vehicles, plant and machinery poses a health hazard to construction staff and people living and working in the vicinity of the site. • Safety And Security issues for the residents due to Inflow of Workers in the area 	<ul style="list-style-type: none"> • All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided. 	<p>Low risk with mitigations</p>																					

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
<ul style="list-style-type: none"> Disturbance of daily Living and Movement Patterns Safety and Security Risks 			<ul style="list-style-type: none"> All flammable substances must be stored in dry area which do not pose an ignition risk to the said substances Ensure all construction vehicles and machinery is under the control of competent personnel. No open fires will be allowed on site unless in a demarcated area identified by the ECO Limit access to the construction site to the workforce only. Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). Construction footprints, including site offices, excavations, storage areas, materials lay-down areas, stockpile area, and workers rest areas should be clearly demarcated or fenced off before construction commences. All construction activities should be limited to the demarcated areas. Access to these demarcated areas strictly controlled. Entry points and access routes to the sites must be clearly marked and traffic limited to those areas as far as possible. Suitable warning and information signage should be erected before construction commences. Adequate sanitary and ablutions facilities must be provided for construction workers The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. 	
Description	Without Mitigation	With Mitigation		
Probability	Highly Probable (4)	Probable (3)		
Duration	Short-term (2)	Short-term (2)		
Extent	Local (2)	Local (2)		
Magnitude	High (8)	Moderate (6)		
Significance	48 (moderate)	Low (24)		
Status (positive or negative)	Negative	Negative		

2.2 IMPACTS THAT MAY RESULT FROM THE OPERATION PHASE

Table 5: A summary of anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the **OPERATION PHASE** for the proposed **Mounted Pipeline on Culvert and Trenchless methods for river crossing**.

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
IMPACT ON WATERCOURSES																							
<p>Nature of the Impact: <u>Changes in water flow regime impact ratings</u></p> <ul style="list-style-type: none"> Since the pipes will be mounted to the culvert, this assessment assumes that the footprint of the construction activities will be limited to the existing road and reserve. Since no vehicles will encroach onto the bed and banks of the watercourse, nor will the stream need to be diverted, <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #cccccc;">Description</th> <th style="background-color: #cccccc;">Without Mitigation</th> <th style="background-color: #cccccc;">With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td>Extent</td> <td>Regional (3)</td> <td>Limited to Local Area (2)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td style="background-color: #ffff00;">33 (moderate)</td> <td style="background-color: #90ee90;">16 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Long term (4)	Short term (2)	Extent	Regional (3)	Limited to Local Area (2)	Magnitude	Moderate (4)	Low (4)	Significance	33 (moderate)	16 (low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> Effective rehabilitation should be conducted as specified in a detailed, site specific rehabilitation plan should any activities encroach onto the wetland or its buffer zone Where necessary, corrective action should be determined by a team of specialists including engineers, hydrologists and ecologists 	<p>Some changes in the hydrology of the wetlands could occur if construction activities need to extend into the wetland or its buffer zone</p>
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Long term (4)	Short term (2)																					
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Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Changes in sediment entering and exiting the system</u></p> <p>Changing the amount of sediment entering water resource and</p>	<ul style="list-style-type: none"> Effective sediment traps should be installed. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). Remove only the vegetation where essential for construction and do not allow any 	<p>Moderate to high since reversing sediment pollution is unlikely to be effective and may cause more damage</p>																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>associated change in turbidity (increasing or decreasing the amount). Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation although this will be limited to the vertical shafts adjacent to watercourses. Trenching through watercourses will have an increased risk of sediment pollution. Possible sources of the impacts include:</p> <ul style="list-style-type: none"> Disturbance of soil surface Disturbance of slopes through creation of roads and tracks adjacent to the watercourse Erosion (e.g. gully formation, bank collapse) <table border="1" data-bbox="143 612 748 946"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Long term (4)</td> <td>Medium term (3)</td> </tr> <tr> <td>Extent</td> <td>Regional (3)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>33 (Moderate)</td> <td>18 (Low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Long term (4)	Medium term (3)	Extent	Regional (3)	Local (2)	Magnitude	Moderate (4)	Low (4)	Significance	33 (Moderate)	18 (Low)	Status (positive, negative or neutral)	Negative	Negative	<p>disturbance to the adjoining natural vegetation cover.</p> <ul style="list-style-type: none"> Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction. Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. Runoff from the construction area must be managed to avoid erosion and pollution problems. <ul style="list-style-type: none"> Monitoring should be done to ensure that sediment pollution is timeously dressed 	
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Long term (4)	Medium term (3)																					
Extent	Regional (3)	Local (2)																					
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Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Introduction and spread of alien vegetation.</u></p> <ul style="list-style-type: none"> The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users. As for the potential impact associated with sedimentation, this 	<ul style="list-style-type: none"> Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. <ul style="list-style-type: none"> Rehabilitate or revegetate disturbed areas 	<p>Expected to be high due to large extent of exotic vegetation in the area.</p>																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>potential impact is related to activities upslope from the watercourse rather than along the watercourse crossing itself, since it is expected that the construction footprint across the watercourse crossing will be limited to the existing road and its reserve.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Medium-term (2)</td> <td>Medium term (3)</td> </tr> <tr> <td>Extent</td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td style="background-color: #c6efce;">24 (low)</td> <td style="background-color: #c6efce;">18 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Medium-term (2)	Medium term (3)	Extent	Local (2)	Local (2)	Magnitude	Low (4)	Low (4)	Significance	24 (low)	18 (low)	Status (positive, negative or neutral)	Negative	Negative		
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Significance	24 (low)	18 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Loss and disturbance of wetland habitat and fringe vegetation.</u></p> <ul style="list-style-type: none"> Limiting construction activities to the existing road and reserve area will largely eliminate this possible impact. However, it is possible that some footprint on either side of the bridge, for example turning of heavy vehicles, or crew camps, may impact on wetland habitat or its buffer <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Medium-term (2)</td> <td>Medium term (3)</td> </tr> <tr> <td>Extent</td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td style="background-color: #c6efce;">24 (low)</td> <td style="background-color: #c6efce;">18 (low)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Medium-term (2)	Medium term (3)	Extent	Local (2)	Local (2)	Magnitude	Low (4)	Low (4)	Significance	24 (low)	18 (low)	<ul style="list-style-type: none"> Operational activities should not take place within watercourses or buffer zones Where wetland habitat is disturbed, this should be noted and rehabilitation to ensure reestablishment of appropriate vegetation species should be ensured. 	<p>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation and control of alien species on the site is undertaken where necessary.</p>			
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Medium-term (2)	Medium term (3)																					
Extent	Local (2)	Local (2)																					
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Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Changes in water quality due to foreign materials and increased nutrients.</u></p> <ul style="list-style-type: none"> Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/ivers and a reduction in watercourse function. <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Possible (2)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td>Magnitude</td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>24 (Low)</td> <td>16 (Low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Short-term (2)	Short-term (2)	Extent	Local (2)	Local (2)	Magnitude	Low (4)	Low (4)	Significance	24 (Low)	16 (Low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer. Maintenance of buffer zones to trap sediments with associated toxins Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects. Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse Treatment of pollution identified should be prioritized accordingly. 	Expected to be low as the pipeline transports clean water only
Description	Without Mitigation	With Mitigation																							
Probability	Probable (3)	Possible (2)																							
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Status (positive, negative or neutral)	Negative	Negative																							
IMPACT ON VEGETATION																									
<p>Nature of the Impact: <u>Clearing of vegetation, especially the modified grassland of low-medium sensitivity</u></p> <p>The may require the removal of some of the modified grassland that serve as catchment to the riparian vegetation. If these impacts are foreseen, it can be mitigated.</p> <p>The sources of this impact could include:</p> <ul style="list-style-type: none"> Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers; 			<ul style="list-style-type: none"> Rehabilitate construction camps and any other vegetation that was impacted on by the construction. Use grass sods that were removed prior to construction to rehabilitate the construction footprints. Sods must not be stored for lengthy periods and should not be stacked on top of each other or on top of grazed and moist grasslands. The sods should preferably be removed during the winter months and replanted by springtime latest. Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular or pedestrian access. Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. Maintenance workers may not trample natural vegetation and work should be restricted to 	<ul style="list-style-type: none"> Localised alteration of soil surface characteristics. The colonisation of the disturbance footprint by invasive trees. 																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<ul style="list-style-type: none"> Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction. <table border="1" data-bbox="143 387 748 687"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td>Duration</td> <td>Short term (2)</td> <td>Very short (1)</td> </tr> <tr> <td>Extent</td> <td>Local area (2)</td> <td>Limited to Site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>30 (medium)</td> <td>12 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Short term (2)	Very short (1)	Extent	Local area (2)	Limited to Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	30 (medium)	12 (low)	Status (positive, negative or neutral)	Negative	Negative	<p>previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.</p> <ul style="list-style-type: none"> Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO. 	
Description	Without Mitigation	With Mitigation																					
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Significance	30 (medium)	12 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Destruction or degradation of riparian vegetation</u></p> <p>The construction of the pipeline will inevitably require the removal or of vegetation within and around the watercourse. This will impact on the health and functioning of the vegetation within the watercourse. Construction could also result in pollution of the watercourse.</p> <p>Although the pipeline is planned to be fixed to the existing culverts over the watercourse, trampling, degradation and destruction of some plants can be expected.</p> <table border="1" data-bbox="143 1147 763 1347"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Improbable (3)</td> </tr> <tr> <td>Duration</td> <td>Short term (3)</td> <td>Very short term (1)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to the Site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Moderate (6)</td> <td>Moderate (6)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (3)	Duration	Short term (3)	Very short term (1)	Extent	Limited to Local Area (2)	Limited to the Site (1)	Magnitude	Moderate (6)	Moderate (6)	<ul style="list-style-type: none"> After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. Ensure that the vegetation disturbed during construction is rehabilitated and prevent the colonisation of the disturbed area by invasive alien plant species. Ensure that maintenance work does not take place haphazardly, but according to a fixed plan and only within the dedicated road reserves. Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular and pedestrian access until such time that rehabilitation was successful. Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to. Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO. Repair all erosion damage as soon as possible and in any case not later than six months before the termination of the Maintenance Period to allow for sufficient rehabilitation growth. 	<p>Erosion, pollution of the watercourse and invasion by alien invasive plant species.</p>						
Description	Without Mitigation	With Mitigation																					
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Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
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Significance	33 (medium)	24 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Potential increase in invasive vegetation</u></p> <p>Removing of existing invasive alien vegetation could have a positive effect and reduce infestations downstream</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Highly probable (4)</td> <td>Improbable (2)</td> </tr> <tr> <td>Duration</td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to the Site (1)</td> </tr> <tr> <td>Magnitude</td> <td>High (8)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>56 (medium)</td> <td>14(low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Highly probable (4)	Improbable (2)	Duration	Long term (4)	Short term (2)	Extent	Limited to Local Area (2)	Limited to the Site (1)	Magnitude	High (8)	Low (4)	Significance	56 (medium)	14(low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> Only use indigenous species for rehabilitation. Rehabilitation within the Andesite Mountain Bushveld should include a suitable, indigenous seed mix. The area should be monitored to ensure that indigenous species colonise the disturbance footprint and that no re-infestation by wattle trees takes place. Remove alien invasive species from the disturbance footprint as soon as they become apparent. 	Re-infestation in areas initially cleared.
Description	Without Mitigation	With Mitigation																							
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Significance	56 (medium)	14(low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Clearing of land for construction camps and potential pollution of the soil and water</u></p> <p>The removal of surface vegetation will expose the soils, which in rainy events would wash down into the watercourses, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive plant</p>			<ul style="list-style-type: none"> Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular and pedestrian access where needed. <ul style="list-style-type: none"> Monitor rehabilitation and ensure that rehabilitated areas do not erode. If monitoring finds that indigenous vegetation from the surrounding grasslands are not colonising the site, implement a re-vegetation plan to ensure that grass species that naturally occur in Andesite Mountain Bushveld, 	Compaction on construction camps could result in altered topsoil characteristics and vegetation composition. These areas are also prone to invasion by alien invasive plant species.																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance vehicles could disturb rehabilitated areas which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern. The sources of this impact include:</p> <ul style="list-style-type: none"> • Removal of vegetation in proximity to the watercourse, without proper rehabilitation or failure of rehabilitation; • Access roads, especially on slopes, channels rainfall and causes erosion; • Lack of rehabilitation or failed rehabilitation; • Maintenance vehicles disturbing rehabilitated areas; • Spillages of construction material and harmful chemicals; and • Failure of rehabilitation of the construction footprint <table border="1" data-bbox="143 826 748 1155"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td>Duration</td> <td>Medium term (3)</td> <td>Short term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to the Site (1)</td> </tr> <tr> <td>Magnitude</td> <td>High (8)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>39 (medium)</td> <td>14 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Medium term (3)	Short term (2)	Extent	Limited to Local Area (2)	Limited to the Site (1)	Magnitude	High (8)	Low (4)	Significance	39 (medium)	14 (low)	Status (positive, negative or neutral)	Negative	Negative	<p>are sowed in order to re-establish indigenous plant cover.</p> <ul style="list-style-type: none"> • Repair identified leaks to the pipe and address issues of water wastage as soon as these are identified. 	
Description	Without Mitigation	With Mitigation																					
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Significance	39 (medium)	14 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses</u></p>	<ul style="list-style-type: none"> • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular and pedestrian access where needed. 	<p>Burst pipeline eroding surrounding soils and vegetation.</p>																					

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
<p>The removal of surface vegetation will expose the soils, which in rainy events would wash down into the watercourses, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive plant species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance vehicles could disturb rehabilitated areas which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern. The sources of this impact include:</p> <ul style="list-style-type: none"> • Removal of vegetation in proximity to the moist grassland, without proper rehabilitation or failure of rehabilitation; • Access roads, especially on slopes, channels rainfall and causes erosion; • Lack of rehabilitation or failed rehabilitation; • Maintenance vehicles disturbing rehabilitated areas; • Spillages of construction material and harmful chemicals; and • Failure of rehabilitation of the construction footprint. <table border="1" data-bbox="143 959 768 1289"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Medium term (3)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Site bound (1)</td> </tr> <tr> <td>Magnitude</td> <td>High (8)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>39 (medium)</td> <td>14 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Medium term (3)	Short-term (2)	Extent	Limited to Local Area (2)	Site bound (1)	Magnitude	High (8)	Low (4)	Significance	39 (medium)	14 (low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> ○ Monitor rehabilitation and ensure that rehabilitated areas do not erode. ○ If monitoring finds that indigenous vegetation from the surrounding grasslands are not colonising the site, implement a re-vegetation plan to ensure that grass species that naturally occur in Andesite Mountain Bushveld, are sowed in order to re-establish indigenous plant cover. • Repair identified leaks to the pipe and address issues of water wastage as soon as these are identified. 	
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Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
IMPACTS ON FAUNA																							
<p>Nature of the Impact: <u>Reduction of natural migratory and faunal dispersal routes.</u></p> <p>Due to the modest nature of the undertaking, very little (if any) of the existing natural habitat will be destroyed. We do not know how the pipe sections will be handled, but there will be a measure of mechanisation involved, but over a limited period.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to site (1)</td> <td>Limited to site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>21 (low)</td> <td>21 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Short-term (2)	Short-term (2)	Extent	Limited to site (1)	Limited to site (1)	Magnitude	Low (4)	Low (4)	Significance	21 (low)	21 (low)	Status (positive, negative or neutral)	Negative	Negative	<p>Ensure maintenance of drainage line with 30-m buffer as primary dispersal corridor.</p>	
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Probable (3)																					
Duration	Short-term (2)	Short-term (2)																					
Extent	Limited to site (1)	Limited to site (1)																					
Magnitude	Low (4)	Low (4)																					
Significance	21 (low)	21 (low)																					
Status (positive, negative or neutral)	Negative	Negative																					
<p>Nature of the Impact: <u>Possible increase in exotic vegetation</u></p> <p>Exotic vegetation may be accidentally introduced to the environment via the intended subterranean pipeline.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Short-term (2)	Short-term (2)	<ul style="list-style-type: none"> • Implement a policy within the development zone that only indigenous plant species is used should landscaping deemed necessary. • Natural open spaces should be left in their undeveloped state and any existing or new exotic vegetation that is present on the site should be removed and eradicated. • Continue to remove all exotic, invasive vegetation and implement a monitoring and eradication plan to keep the site free from invasive plants. 													
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Probable (3)																					
Duration	Short-term (2)	Short-term (2)																					

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
Extent	Limited to Local Area (2)	Limited to site (1)																							
Magnitude	Medium (6)	Low (4)																							
Significance	30 (Medium)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Displacement of indigenous vertebrates</u></p> <p>The development will modestly and temporarily modify the natural habitat of various vertebrates. However, indigenous vertebrate residents should not suffer long term effects of the pipeline once it is operational.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Medium (6)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>30 (Medium)</td> <td>21 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Short-term (2)	Short-term (2)	Extent	Limited to Local Area (2)	Limited to site (1)	Magnitude	Medium (6)	Low (4)	Significance	30 (Medium)	21 (low)	Status (positive, negative or neutral)	Negative	Negative	Maintenance of the dispersal corridor along the stream should minimise losses and assist with any subsequent recolonization along the pipeline route.	
Description	Without Mitigation	With Mitigation																							
Probability	Probable (3)	Probable (3)																							
Duration	Short-term (2)	Short-term (2)																							
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Significance	30 (Medium)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Increased amounts of surface water runoff</u></p> <p>Should there be any runoff waters these will be absorbed by the restored linear development as well as adjacent areas.</p>			Implement an ecologically sound storm water management plan, including where necessary retention ponds and artificial water sponges (wetlands).																						

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
Description	Without Mitigation	With Mitigation																							
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Significance	30 (Medium)	21 (low)																							
Status (positive, negative or neutral)	Negative	Negative																							
<p>Nature of the Impact: <u>Disturbances of fauna in sensitive vegetation</u></p> <p>Vehicle activity along the development could disturb faunal species that depend on any natural, sensitive vegetation on either side of the stream.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to site (1)</td> </tr> <tr> <td>Magnitude</td> <td>Medium (6)</td> <td>Low (4)</td> </tr> <tr> <td>Significance</td> <td>30 (Medium)</td> <td>21 (low)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Probable (3)	Duration	Short-term (2)	Short-term (2)	Extent	Limited to Local Area (2)	Limited to site (1)	Magnitude	Medium (6)	Low (4)	Significance	30 (Medium)	21 (low)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> • A management plan to prevent maintenance workers from disturbing or harassing any mammal, bird, reptile or frog. • Implement a monitoring programme to regularly assess the presence of faunal species within the sensitive vegetation, including road verges, in particular the grassland and drainage habitats. 	
Description	Without Mitigation	With Mitigation																							
Probability	Probable (3)	Probable (3)																							
Duration	Short-term (2)	Short-term (2)																							
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Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented																					
HERITAGE IMPACT																							
<p>Nature of the Impact: <u>Loss and disturbance of heritage sites due to the development.</u></p> <p>There are no heritages or archeological resources identified at the project site. Therefore this impact will not be assessed further in this basic assessment report</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Low (1)</td> <td>Low (1)</td> </tr> <tr> <td>Duration</td> <td>Permanent (5)</td> <td>Permanent (5)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (1)</td> <td>Limited to Local Area (1)</td> </tr> <tr> <td>Magnitude</td> <td>Minor (8)</td> <td>Minor (8)</td> </tr> <tr> <td>Significance</td> <td>Low (8)</td> <td>Low (8)</td> </tr> <tr> <td>Status (positive, negative or neutral)</td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Low (1)	Low (1)	Duration	Permanent (5)	Permanent (5)	Extent	Limited to Local Area (1)	Limited to Local Area (1)	Magnitude	Minor (8)	Minor (8)	Significance	Low (8)	Low (8)	Status (positive, negative or neutral)	Negative	Negative	<ul style="list-style-type: none"> Nonetheless, should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made. 	N/A
Description	Without Mitigation	With Mitigation																					
Probability	Low (1)	Low (1)																					
Duration	Permanent (5)	Permanent (5)																					
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VISUAL IMPACTS																							
<p>Nature of the Impact: <u>Visual Impacts</u></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td>Probability</td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td>Duration</td> <td>Short-term (2)</td> <td>Short-term (2)</td> </tr> <tr> <td>Extent</td> <td>Limited to Local Area (2)</td> <td>Limited to Local Area (2)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Short-term (2)	Short-term (2)	Extent	Limited to Local Area (2)	Limited to Local Area (2)	<ul style="list-style-type: none"> Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent or surrounding properties including road verges, roads or public places and open spaces during or after the construction period. All waste/litter/rubbish etc. must be disposed of at an approved dumping site as approved by the Council. Bare surfaces must be rehabilitated as soon as possible with indigenous vegetation that will be able to grow in the area; The landscape must be rehabilitated in such a way that it corresponds to the surrounding 	The risk is low provided the mitigation measures are implemented									
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Short-term (2)	Short-term (2)																					
Extent	Limited to Local Area (2)	Limited to Local Area (2)																					

Potential impacts:			Proposed mitigation:	Risk of the impact and mitigation not being implemented
Magnitude	Medium (6)	Low (4)	topography; • Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighboring residents. In this situation low flux and frequency lighting shall be utilized.	
Significance	30 (Medium)	20 (Low)		
Status (positive, negative or neutral)	Negative	Negative		
SOCIAL IMPACTS				
Nature of the Impact: <u>Livelihoods improved</u> (Positive)			None required	none
<ul style="list-style-type: none"> Project is meant to address the current situation of the crossing has been severely affected by flooding in the past which has compromised its functional capabilities. This route is currently not safe as it is a low-lying area and has on occasion flooded with fast moving water streams in some areas. This poses a danger to the community and learners in particular. 				
Description	Without Enhancement	With Enhancement		
Probability	Probable (3)	Probable (3)		
Duration	Short-term (2)	Short-term (2)		
Extent	Limited to Local Area (2)	Limited to Local Area (2)		
Magnitude	Medium (6)	Medium (6)		
Significance	30 (Medium)	30 (Medium)		
Status (positive, negative or neutral)	Positive	Positive		

Potential impacts:	Proposed mitigation:	Risk of the impact and mitigation not being implemented

2.3 NO GO OPTION

This is the option of not constructing the pipeline, this option will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. This alternative implies that the Joburg Water Operations Department cannot implementation this project which will address the recurring pipe bursts that cause water interruptions to the residents of Vorna Valley, will improve the level of service in the area.; which will ultatmely result in financial savings for Johannesburg Water as pipe repairs and unaccounted for water will be reduced. **The no go option is therefore not preferred**

Table 6: Potential impacts should the development not be Approved “No-Go” Alternative

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Impact on wetland	Low	There are no mitigation measures	Negligible	No risk
Impact on vegetation	Low	There are no mitigation measures	Negligible	No risk
Sedimentation	Negligible	There are no mitigation measures	Negligible	No risk
Establishment of alien plants	N – Very High	There are no mitigation measures	N – Low	Very Low risk
Loss of wetland habitat	Negligible	There are no mitigation measures	Negligible	No risk
Pollution of watercourses	Negligible	There are no mitigation measures	Negligible	No risk
Destruction of protected plants and plants of conservation concern	Negligible	There are no mitigation measures	Negligible	No risk
Visual Impacts	Negligible	There are no mitigation measures	Negligible	No risk
Noise Impacts anticipated	Negligible	There are no mitigation measure	Negligible	
Loss and disturbance of heritage sites due to the development.	Negligible	There are no mitigation measures	Negligible	No risk
Social impacts anticipated during the construction period (Positive)	N – Very High	There are no mitigation measures	Negligible	No risk

Social impacts anticipated during the construction period (Negative)	Negligible	There are no mitigation measures	Negligible	No risk
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List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

- Wetland Assessment
- Vegetation Assessment
- Fauna Impact Assessment
- Heritage Assessment

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

Vegetation studies should be conducted during the growing season of all plant species that may potentially occur. Threatened species are usually also cryptic species that are easily overlooked when not in flower. This assessment relied on a site visit undertaken on the 26th of September 2018, when some species may still have been dormant. However, the potential occurrence of such species was assessed based on the availability of suitable habitat.

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING 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.

Proposed and Alternative Designs

Potential impacts:	Significance rating of impacts (positive, negative or neutral):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
<p>Considering the strategic importance of this infrastructure, it is unlikely that it will be decommissioned in the foreseeable future. The infrastructure may however require maintenance and repairs during the life of its operation, whereby the similar impacts might be experienced as during construction phase of the project. Should the infrastructure need maintenance or repairs, the mitigation and management measures provided for during the construction phase will be implemented.</p>				

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

Specialist studies for decommissioning and closure phase will be undertaken at the time when decommissioning is contemplated by the developer.

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

Ongoing post decommissioning management cost will not be determined at this stage as this phase of the development is not yet contemplated.

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:

Cumulative impacts can result from an effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. The anticipated cumulative impacts of this development includes the following:

Impacts on the Wetland

- Changing the quantity and fluctuation properties of the watercourse: some changes in the hydrology of the wetlands could occur due to ineffective sediment control and rehabilitation. However, this is considered unlikely given that construction activities are limited to the existing road reserve
- Changes in sediment entering and exiting the system are expected to be moderate to low. Should mitigation measure not be implemented and sediment from upslope activities is washed into the watercourse, changes to the hydrology of the stream, including meandering, increased potential for flooding and movement of bed material may result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place.

Destruction or degradation of riparian vegetation

- Loss of functionality of the vegetation within the watercourse, as well as erosion and subsequent degradation of the riparian vegetation and its function.

Potential increase in invasive vegetation

- A number of invasive species are present within the area that the proposed development is situated in. Therefore, if mitigation measures to limit and prevent the spread of alien species are not implemented, the cumulative impact could lead to remaining natural vegetation transformed by alien plant species.

Exposure to erosion, sedimentation or pollution of proximate watercourses

- Possible contamination of the water course and groundwater reserves due to hydrocarbon or other spillage and an increase of modified areas (together with surrounding developments) that will affect flora population dynamics and runoff patterns
-

Direct impact on species richness and loss of habitat (fauna)

- Construction and operational activities may result in cumulative impact to the traditional migration routes of mammals, reptiles and especially frogs on the study site and on adjacent properties.
- Altered population dynamics of natural indigenous species could cause significant impact on overall faunal community structure and alter natural food-chains.
- It is imperative that effective protective measures should be put into place to protect wetlands and their buffer areas. The increased roads and traffic will definitely cause permanent disruption of migration routes unless mitigation takes place.

Increased socio-economic upliftment as a result of the proposed development (Positive Impact)

- Constructing the proposed development will result in additional jobs being created in the area and skills development during the construction phase. Due to the high unemployment rate in the study area. The positive impact will be very low positive but with enhancement it can be low positive.

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

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.

The following **conclusions were drawn from the specialist studies** undertaken within this Basic Assessment:

Wetland Assessment:

The Vorna Valley wetland system lies in a deep Northeast – Southwest aligned valley approximately 55m below the higher points in the catchment. The catchment is highly transformed with dense residential and commercial infrastructure as well as roads. No natural vegetation remains apart from a small area south of the Grand Central Airport. The drivers of wetlands in Midrand were described as hillslope seepage processes dominated by shallow interflow in a sandy soil layer over an impervious plinthic layer. This process was generally not considered as significant for groundwater recharge (Parsons, cited in Batchelor, 2009).

The proposed pipeline upgraded lies across two branches of a watercourse that feeds into the Jukskei River approximately 2.7km to the west of the site. A small tributary enters this system from the south east. The easternmost sections of the watercourses are classified as riparian with slower energy wetland conditions occurring on the western section, predominantly west of Le Roux Avenue.

Vegetation Assessment

This assessment found that the pipeline route will impact on riparian vegetation at the water crossings, classified as being of medium to high sensitivity. Modified grassland, associated with the riparian vegetation, were classified as being of low-medium sensitivity to the pipeline upgrade. The main concern from a vegetation perspective is the destabilising of vegetation along the riparian areas as well as modified grassland surrounding it. The operational phase impacts are expected to be limited and could take place if the pipe burst, eroding soils

and washing away vegetation. The potential invasion of the disturbance footprint by invasive plant species may also occur.

Fauna assessment:

The intended upgrade of the bulk water supply pipe is essential to maintain reliable service delivery to the Vorna Valley communities and, importantly, the avoidance of ruptured high pressure conduits. It is needless to point out that a rupture of a large high pressure water pipe will, apart from wastage, also have ecological consequences. Furthermore, the ecological footprint of the new pipeline will be insignificant once the trench has been filled and attained ecological equilibrium.

The terrestrial habitat type is relatively small and additionally it has been differentially degraded or transformed by fires, mowing and the side-effects of urbanization. We deem it as of a 'Medium-Low Conservation Sensitivity'.

Since the seasonal stream and associated wetland system enjoys statutory protection, we flag it as having a 'Medium-High Conservation Sensitivity'.

From the perspective of vertebrate species richness, national conservation rankings and population dynamics no reasonable objection can be raised to the planned upgrade. In fact, this undertaking is commendable for its foresight.

Heritage assessment:

As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development. From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the proposed conditions. Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Conclusion:

The majority of the proposed pipeline is aligned within the servitudes/ road reserve with two river crossings. Cognisant of the above-mentioned conclusions established through the basic assessment investigation, there were areas of environmental sensitivity identified at the river crossings. These include areas such as sensitive vegetation (i.e. protected plants) & watercourses, these are shown in the environmental sensitivity map (refer to **Appendix A**). The significance levels of the majority of identified negative impacts for all alternatives investigated can generally be reduced to acceptable levels thus, the proposed developments could proceed provided that the mitigation measures set out in this report and in the EMPr and the Rehabilitation Plan (**Appendix H**) are diligently implemented to limit the potential impacts on vegetation, watercourses and social during construction and operation of the developments. It is the opinion of the specialist that no fatal flaws have been identified for the Vorna Valley Emergency Water Pipe Replacement, and that the project should proceed with adequate mitigation measures implemented to reduce impacts to local and downstream water resources.

Alternative 2

See above, the impacts are similar to those of Alternative 1 therefore are not compared collectively.

No-go (compulsory)

This is the option of not constructing & upgrading the older pipeline within Vorna Valley, this option will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. This alternative implies that the Joburg Water Operations Department cannot implement this project which will address the recurring pipe bursts that cause water interruptions to the residents of Vorna Valley, will improve the level of service in the area.; which will ultimately result in financial savings for Johannesburg Water as pipe repairs and unaccounted for water will be reduced.

The no go option is therefore not preferred

6. IMPACT SUMMARY OF THE PROPOSAL AND ALTERNATIVE

A summary of the impact assessments is presented in **Table 7 and 8**; the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (i.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

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

It must be noted that the impact scores in **Table 7 & 8** below are not intended to be definitive measures of environmental impact, but they are a useful guide to evaluating the overall environmental performance of a new development and they assist in interpreting key influences of a development

Table 7: Impact Summary table : CONSTRUCTION PHASE		
Environmental Aspect	Without Mitigation	With Mitigation
IMPACT ON WATERCOURSES		
Changing the quantity and fluctuation properties of the watercourse by for example restricting water flow or increasing flood flows.	Medium	Low
Changes in sediment entering and exiting the system	Medium	Low
Introduction and spread of alien vegetation.	Medium	Low
Loss and disturbance of wetland habitat and fringe vegetation.	Medium	Low
Changes in water quality due to foreign materials and increased nutrients.	Medium	Low
IMPACT ON VEGETATION		

Clearing of vegetation, especially the modified grassland of low-medium sensitivity	Medium	Low
Destruction or degradation of vegetation associated with watercourses	Medium	Medium
Destruction of protected plants and plants of conservation concern	Medium	Low
Potential increase in invasive vegetation	Medium	Low
Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses	Medium	Low
IMPACTS ON FAUNA (Terrestrial)		
Destruction of natural habitat	Low	Low
Destruction of sensitive vertebrate habitat	Low	Low
Loss of ecosystem function	Low	Low
Loss of the ecological function of wetland	Low	Low
Poaching of wildlife in the vicinity	Low	Low
HERITAGE IMPACT		
Loss and disturbance of heritage sites due to the development.	Low	Low
VISUAL IMPACT		
Visual Impacts	Medium	Low
NOISE IMPACT		
Noise Impacts anticipated	Medium	Low
SOCIAL IMPACT		
Positive Social impacts	Low	Medium
Negative Social impacts	Medium	Low
Table 8: Impact Summary table : OPERATIONAL PHASE		
Environmental Aspect	Without Mitigation	With Mitigation
IMPACT ON WATERCOURSES		
Changing the quantity and fluctuation properties of the watercourse by for example restricting water flow or increasing flood flows.	Medium	Low
Changes in sediment entering and exiting the system	Medium	Low
Introduction and spread of alien vegetation.	Low	Low
Loss and disturbance of wetland habitat and fringe vegetation.	Low	Low
Changes in water quality due to foreign materials and increased nutrients.	Low	Low
IMPACT ON VEGETATION		
Destruction of vegetation of low-medium and medium sensitivity	Medium	Low
Destruction or degradation of vegetation associated with watercourses	Medium	Low

Destruction of protected plants and plants of conservation concern	Medium	Low
Potential increase in invasive vegetation	Medium	Low
Clearing of land for construction camps and potential pollution of the soil and water	Medium	Low
Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses	Medium	Low
IMPACTS ON FAUNA (Terrestrial)		
Reduction of natural migratory and faunal dispersal routes.	Low	Low
Possible increase in exotic vegetation	Medium	Low
Increased amounts of surface water runoff	Medium	Low
Displacement of indigenous vertebrates	Medium	Low
Disturbances of fauna in sensitive vegetation	Medium	Low
HERITAGE IMPACT		
Loss and disturbance of heritage sites due to the development.	Low	Low
VISUAL IMPACT		
Visual Impacts	Medium	Low
NOISE IMPACT		
Noise Impacts anticipated	Medium	Low
SOCIAL IMPACT		
Positive Social impacts	Medium	Medium

For alternative:

Please refer to **Table 7 & 8**

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 assessment described an approach **proposed** by **mounting the pipeline on Culvert** will be used to install pipes over the watercourse, **Trenchless methods** were also have been assessed as an **alternative** method for river crossing.

Having assessed the impacts of both technology methods to be employed for the river crossings, in both cases, the recorded impacts before mitigation were of Medium significance, it is noted that the majority of the impacts can be reduced to Low with the recommended mitigation measures. Therefore from an **environmental perspective, either method** for the river crossings **can be recommended** for implementation.

From a technical view however, the pipe cracking (trenchless) method requires the use HDPE pipe; JHB water design guideline does not allow us to use HDPE material for water projects. If steel pipe are laid underneath the river bed, the river bed will be disturbed and in future if access to the pipe underneath the river bed is needed, it will be difficult to do maintenance on it. When the pipe is mounted to the bridge no car or any persons will damage easily damage it, it will cost less to maintain it compared to disturbing the river bed and banks. The proposed Alternative (Culvert Mounted) is preferred method of river crossing, for this reason the **proposed alternative is preferred and**

recommended.

7. SPATIAL DEVELOPMENT TOOLS

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

Provincial Spatial Development Framework (PSDF)

The Gauteng PSDF is a provincial and strategic planning policy that responds to and complies with in particular the National Development Plan vision 2030 and the National Spatial Development Perspective (NSDP). This framework promotes a developmental state in accordance to the principals of global sustainability as is stated by among others, the South African constitution and enabling legislation. The Gauteng PSDF is based on six growth and development pillars, each of which has its onset of drivers with long term-programmes. Pillar 1 highlights the job creation. The proposed development will create jobs opportunities during the construction phase, these employment opportunities will target local community members that are usually excluded from mainstream economic and formal employment. Therefore, the development is in line with the Gauteng PSDF.

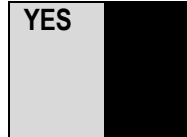
Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).

The study area falls within the City of Johannesburg Metropolitan Municipality Region A. According to the CoJ IDP 2018/19 *The city's total infrastructure backlog stands at R170 billion composed of collapsing bridges, city pavements that are in a poor condition, potholes, burst water pipes and ailing substations. Finding effective solutions to these basic infrastructural problems is crucial, particularly if the City is show increased economic growth and cater to the needs of its poorest and most vulnerable citizens. Despite a requirement to renew approximately 2% of the water network per year, the City has historically renewed only about 0.2% thereof. This decay is reflected in available data from 2016/17 which shows that the water network suffered 45 000 burst for the year have reached 31% and there are currently 371 leaks per kilometre of water pipes. This is despite the fact we know that water will be one of the greatest challenges in our future".*

The proposed development will therefore not compromise the IDP objectives but would rather assist the Local Municipality in achieving the performance areas as identified by the Local Municipality, namely growth in the region and creation of more employment opportunities as well as through the improvement of public services and broadening access to communities and thereby improving quality of living which is further aligned with achieving the goal of opportunity in terms of economic growth and employment which also entails access to basic services, social infrastructure and quality environment. Furthermore the Municipality aims to achieve inclusivity which aims to integrate communities and improve transport corridors and human settlements. One such priority for the Municipality is the improvement of mobility corridors with specific reference to proposed development (road infrastructure). The Municipality seeks to address past spatial planning imbalances by bringing services and economic opportunities close to previously disadvantaged areas.

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).



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:

This Draft BAR has provided a comprehensive assessment of the potential environmental impacts associated with the proposed Vorna Valley Emergency Water Pipe Replacement project. It is the opinion of the EAP and various specialists that there are no environmental or social impacts of high significance that would prevent the establishment of the proposed project, **it is therefore recommended that the project be authorised** with the proposed method of river crossing (pipeline mounted onto existing culvert) be implementation.

The authorisation must be subjected to the following conditions:

- A final detailed layout must be submitted to the relevant authority for approval prior to commencement with the project;
- The Environmental Management Programme (EMPr) as contained within Appendix H of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed power line, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- No construction should take place in watercourses under wet conditions unless there is an emergency with safety implications or environmental impacts.
- Minimise the footprint of activities in the wetland and buffer zone by preventing unnecessary access of vehicles and personnel
- Consider the methods that will have least impact on the watercourses
- Where necessary, corrective action should be determined by a team of specialists including engineers, hydrologists and ecologists
- The relevant authorisations and water use licenses must be obtained from Department of Water Affairs prior to the commencement of construction activities. No activities may proceed within or in proximity to watercourses without a Water Use License permitting the activity.
- The final route and watercourse crossing methods should impact on as little portion thereof as possible.
- Engineer a method whereby water released from the pipeline (e.g. faulty or burst pipe) can be contained and diverted to where slow release or infiltration of the water is allowed.
- Compile and implement an alien invasive monitoring plan to remove alien invasive plant species from the site, prior to construction.
- Should heritage features, archaeological sites or graves be exposed during construction work, it must

immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

- All relevant legislation and requirement of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with
- In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of NEMA.
- Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by GDARD.

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

The pipe replacement programme is one of the key strategies of City of Johannesburg is improving the level of service provided to residents and combating water losses by reduction of burst pipes. Johannesburg water infrastructure strategic planning section commissioned a desktop study to identify pipes which require replacement in order to rank the pipes which require replacement in order of priority. The main factor contributing to burst pipes is ageing of the infrastructure (pipes), based on investigations and assessments pipes which frequently burst are the ones which have a remaining useful life (RUL) of less than 2 years.

Johannesburg Water's Operations Department, Midrand Depot have through a work request, requested a replacement of two (2) Asbestos Cement (AC) pipes of diameters of 200mm and 250mm running approximately 970m parallel, with 355mm diameter Steel (ST) pipe along Le Roux Avenue due to continuous bursts experienced by the pipes. The existing pipes are crossing a stream at two points and that has made it difficult to operate and maintain the pipes when there is a pipe burst. According to the Asset Register the two existing pipes have a remaining useful life greater than 20 years, but due to the fact that they cannot withstand the pressures in the area they require urgent replacement to lessen the number of bursts.

Vorna Valley Emergency Water Pipe Replacement project aims at replacing the existing Asbestos Cement pipes in the area with the approved Steel pipes as per Johannesburg Water's standard design guidelines, which will help improve the level of service and also curb the loss of water.

Implementation of this project will address the recurring pipe bursts that cause water interruptions to the residents of Vorna Valley, will improve the level of service in the area. This will also result in financial savings for Johannesburg Water as pipe repairs and unaccounted for water will be reduced.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (Consider when the activity is expected to be concluded)

Duration and Validity: The environmental authorization is required for a period of 10 years from the date of issue. Should a longer period be required, the applicant/EAP will be required to provide a detailed motivation on what the period of validity should be

11. THE PERIOD 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: APPENDICES

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 A: Site plan(s)

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.