

**DRAFT BASIC ASSESSMENT REPORT
FOR THE CONSTRUCTION AND OPERATION
OF A PROPOSED BULK WATER SUPPLY PIPELINE
SALVOKOP, CITY OF TSHWANE
METROPOLITAN MUNICIPALITY,
GAUTENG PROVINCE**

SUBMITTED TO:

The Department of Forestry,
Fisheries and the
Environment:
Integrated Environmental
Authorizations

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APPLICANT:



**public works
& infrastructure**

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA



Analyse
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REPUBLIC OF SOUTH AFRICA



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October 2022

REPORT TITLE:	Draft Basic Assessment Report For The Proposed Construction And Operation Of A Bulk Water Supply Pipeline, Salvokop, City Of Tshwane Metropolitan Municipality, Gauteng Province
DEVELOPER:	Department of Public Works and Infrastructure
CLIENT:	Government Technical Advisory Committee
ENGINEER:	CAPIC SA (PTY) Ltd.
SPOOR PROJECT REFERENCE:	02/03_salvokop env
PLACE AND DATE:	Pretoria, October 2022

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DECLARATION OF INDEPENDENCE

I, JC van Rooyen as authorised representative of SPOOR Environmental Services hereby confirm my independence as an Environmental Assessment Practitioner and declare that neither I nor SPOOR Environmental Services (PTY) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which SPOOR Environmental Services (PTY) Ltd. was appointed as Environmental Assessment Practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed, specifically in connection with the Salvokop Bulk Water Supply Pipeline, City of Tshwane Metropolitan Municipality, Gauteng Province.

Signed JC van Rooyen

Date: 2022-10-07

REPORT DISTRIBUTION LIST

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Cllr. F Mampuru	City of Tshwane Metropolitan Municipality - Councillor Ward 80
M Moshapo	Freedom Park

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EXECUTIVE SUMMARY

SPOOR Environmental Services (PTY) Ltd. was appointed by CAPIC SA (PTY) Ltd. on behalf of the Department of Public Works and Infrastructure (DPWI) as the Environmental Assessment Practitioner (EAP) to apply for Environmental Authorisation (EA) for the proposed bulk water supply pipeline development as a Basic Assessment Process in terms of the NEMA, 2014 EIA Regulations is triggered. The pipeline installation is required in terms of the routine maintenance management planning as outlined in the Water System Master Plan for this area (Salvokop) of the City of Tshwane Metropolitan Municipality (CoT). As part of the appointment SPOOR has also been tasked to develop a site-specific environmental management programme report, inclusive of a landscape rehabilitation plan to guide the construction and post-construction rehabilitation as well as the operational activities at the site .

Locality

The proposed pipeline site is situated to the Southwest of the Tshwane City Centre on the remainder of portion 406 of the Farm Pretoria Town and Townlands 351 -JR, Gauteng Province. Access to the property is gained via Koch Street which connects to the north of the site.

Project Description

The current 700 mm diameter steel pipe from the Salvokop reservoir is approaching the end of its design life and an agreement has been reached between the City of Tshwane Metropolitan Municipality and the Department of Public Works that the existing 700 mm dia pipeline will be decommissioned and replaced by a new 850 mm diameter steel pipeline, which will be sufficient to supply the entire Salvokop reservoir supply zone, i.e. the existing zone and the proposed Salvokop Government Precinct development.

A registered servitude exists for the proposed pipeline, but the existing pipeline cannot be decommissioned while the new pipeline is installed. In addition, there is also tourism infrastructure on top of the existing servitude which necessitated an alternative route.

Approximately 4200m² of indigenous vegetation (280m x 10-15m wide= 4200m²) will be disturbed for the construction of the pipeline on a new alignment.

The proposed infrastructure includes;

- ❖ ± 365m bulk water pipeline of which ±250m falls outside of the existing servitude;
- ❖ Pipeline made of 8mm thick continuous welded steel pipe;
- ❖ Pipeline buried a minimum of 2m deep and placed on a 150mm sand bedding layer;
- ❖ Minimum cover of 1m over pipeline;
- ❖ ± 2m wide excavation in a 10m servitude;
- ❖ Associated pipeline infrastructure.

Construction Phase Activities:

- ❖ Site Camp establishment including site offices, materials, and equipment storerooms, material laydown areas, construction vehicle parking, sanitary facilities, and the fencing off, of the construction camp etc.;

- ❖ Site preparations for the start of construction including setting out of the construction areas by the land surveyor; traffic abatement and other statutory arrangements etc.

Construction Phase Facilities:

- ❖ Security fence around the construction camp;
- ❖ Site offices;
- ❖ Construction materials storerooms and laydown areas;
- ❖ Construction vehicle parking;
- ❖ Chemical Toilets;
- ❖ Waste collection area.

Operational Phase:

- ❖ See first paragraph above.

Study Methodology

In short, this BAR will describe the following:

In short, this BAR will describe the following:

- ❖ The background to the project;
- ❖ The relevant legislation and guidelines that were considered in preparation of the EIA Report;
- ❖ a description of the property on which the proposed activity is to be located;
- ❖ a detailed description of the proposed scope of work;
- ❖ a description of the environment that may be affected by the project which will include all current physical, biological, social, economic, and cultural aspects of the receiving environment;
- ❖ details of the public participation process conducted;
- ❖ a description of all feasible and reasonable alternatives;
- ❖ identification of all physical, biological, social, economic, and cultural environmental impacts of the proposed development on the properties.

Public Participation

The public participation process to follow will be conducted as set forth in Chapter 6 of the Environmental Impact Assessment Regulations R543 of the NEMA (Act No. 107 of 1998). A summary of all the comments received by interested and affected parties, as well as the response from the environmental practitioner will be included in the comments and response report.

Alternatives

Key reasons why no alternatives were considered:

- ❖ The site where the facility is located is within an existing area with the same land use zoning (See Appendix 7),
- ❖ The pipeline installation is required in terms of the routine maintenance management planning as outlined in the Water System Master Plan for this area (Salvokop) of the City of Tshwane Metropolitan Municipality.
- ❖ To avoid having to disturbed already developed areas as part of the Freedom Park development, the pipeline servitude will be realigned.
- ❖ The surrounding land uses adjacent to the site are all vacant or light to medium residential uses,

- ❖ The facility is located on the area that was previously disturbed and are heavily invaded by alien species,
- ❖ the operations currently will secure and provide temporary and permanent employment opportunities,
- ❖ With the growing economic pressures on the basic services sector, the area, services, and tourist attractions will not be able to operate in a financially viable manner without the bulk water supply pipeline,
- ❖ Minimal natural or indigenous vegetation will have to be removed for the development to proceed.
- ❖ No heritage or paleontological features will be affected.

Impact Summary

Potential Impacts	Impact Significance with Mitigation
Climate, Geology and Soils:	
❖ Possible scouring and erosion	Low
❖ Possible loss of topsoil	Low
❖ Contaminations	Low
Hydrology:	
❖ Surface water contaminations	Low
❖ Erosion and siltation	Low
❖ Water quality reduction	Low
❖ Infrastructure failure due to erosion damage	Low
Fauna and Flora	
❖ Damage to existing indigenous vegetation	Low
❖ Proliferation of alien vegetation	Low
Local Employment:	
❖ Additional local job opportunities	High (positive)
Visual Impacts:	
❖ Negative visual impact related to vegetation removal	Low
❖ Final visual outlook of the development.	Low
Noise	
❖ Increase of ambient environmental noise levels.	Low
❖ Possible occupational noise levels	Low
Air Quality	
❖ Potential health impacts on workers and locally sensitive receptors due to dust created by construction.	Low
Traffic Safety	
❖ Possible impacts include unsafe traffic conditions during the arrival and departure of large vehicles.	Low
Fire	
❖ Potential fire hazard	Low
Heritage Features	
❖ Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;	Low

Potential Impacts	Impact Significance with Mitigation
<ul style="list-style-type: none"> ❖ Indirect impacts, e.g., restriction of access or visual intrusion concerning the broader environment; ❖ Cumulative impacts that are combinations of the above. 	
Paleontological Features	
<ul style="list-style-type: none"> ❖ Direct or physical impacts, implying alteration or destruction of palaeontological resources within the project boundaries 	Low

Conclusion

It is believed that the most noteworthy, anticipated impacts and other relevant issues have been identified at the conclusion of this, the draft BAR phase of the Salvokop Bulk Water Supply Pipeline. The receiving environment of the proposed development have been scrutinized in terms of the most pertinent impacts revealed by specialist studies, maps, and other literature as well as discussions with representatives of local authorities and interested and affected parties.

Impacts deemed to occur during the construction and operational phase were identified and their significance rated accordingly. Pertinent impacts identified include:

- ❖ Impacts as a result of inclement weather conditions,
- ❖ Surface and subsurface soil contaminations,
- ❖ Surface and groundwater contaminations,
- ❖ Limited disturbances to faunal species,
- ❖ Occupational noise levels,
- ❖ Limited reduction in air quality,
- ❖ Possible traffic safety issues,
- ❖ Potential fire related impacts,
- ❖ Heritage features, and
- ❖ Paleontological resources.
- ❖ On a positive note, the socio-economic benefits created by local employment and the associated benefits to the local economy.

A thorough Public Participation Process in line with the NEMA (Act 107 of 1998) regulations has been conducted thus far and will be maintained for the remainder of the Environmental Authorisation application process. Responses received from local I&APs and other stakeholders to date, as well as proof of the site and newspaper adverts are included in the Comments and responses report, which is appended to this report. The final issues and response report will serve as a summary of the comments and responses received from I&APs throughout the application process and will be included in the final BAR.

In the light of the environmental data described, issues investigated and discussions with interested and affected parties, it is believed that the Environmental Impact Management Process is completed for this, the Draft BAR phase of the pipeline development. The feedlot development is deemed to have a positive socio-economic impact with limited manageable negative impacts. It is therefore recommended that the feedlot development be approved. It will be important to implement the mitigation measures and recommendations stipulated by this BAR and the various specialist studies. These mitigation measures and recommendations are included and refined in the EMP of which adherence must form part of the contractual agreement with

the construction phase contractors appointed and the operational phase farm management staff. A copy of the draft EMPr is included in Appendix 6 and changes will be made where required, once feedback has been received from DFFE and the consultation process have been completed.

DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

In accordance with Regulation 28(1) (a) of Government Notice No. R. 543 of 18 June 2010, this section provides an overview of SPOOR Environmental Service's experience with EIAs, as well as the details and experience of the EAPs that form part of the EIA team.

Name: Helene Botha for
Company: SPOOR Environmental Services (PTY) LTD.
Qualifications: M. Env. Man.; B. Sc (Hons) Zoology; B. Sc Zoology & Genetics
Professional Registration: IAIAsa; EAPASA: 2019/558

Ms. H. Botha has 7 years of experience in EIA, environmental management, report writing, water use licenses and project management. She was responsible for ensuring that the BAR report satisfies the requirements of Chapter 4, Part 3 of GN 982 of the 2014 NEMA (Act 107 of 1998) regulations.

Name: JC van Rooyen
Company: SPOOR Environmental Services (PTY) LTD.
Qualifications: M.Sc. (Environmental Management), B. Landscape Architecture
Professional Registration: EAPASA: 2020/303

SPOOR Environmental Services (PTY) Ltd. has been in operation since 2011. The Director and principal EAP, Mr JC van Rooyen, has been involved in an array of environmental consultation and planning projects in various spheres of the landscape design, development, and environmental management disciplines over the past 20 years. SPOOR Environmental Service's approach towards projects is to strive for sustainable environments that not only reflect artistic and aesthetic quality but also hold diverse ecological and cultural value. The Company is capable of conducting environmental applications and landscape development planning and design for various projects including:

- Scoping Reports
- Environmental Impact Assessment Reports
- Visual Impact Assessments
- Environmental Management Systems/ Plans
- Environmental Management Programmes (EMPr)
- Air Emissions Licence Applications (AEL)
- Waste Management Licence Applications (WML)
- Environmental Audits & Monitoring
- Integrated Environmental Management (IEM)
- Environmental Rehabilitation
- Conservation Planning / Eco-tourism Developments
- Landscape Design and Development
- Landscape/ Environmental Project Management

Applications and processes included for projects over the past 20 years required that the EAPs have sound knowledge and skill in the areas of undertaking of public participation processes, the translation of scientific information into comprehensible impact assessment reporting and an understanding of the financial implications of the various projects in order for these applications to be successful. This indicates that the EAPs are capable to conduct the environmental assessment for the proposed project.

PROJECT TEAM

The project team working on the proposed project consists of the following practitioners:

- ❖ **Mr. J.C. Van Rooyen** (*BL., M. Sc (Env. Soc)*) (SACLAP) (Principal EAP)
Landscape Technologist and Environmental Assessment Practitioner
- ❖ **Ms. H.E. Botha** (*M. Env. Man.; B. Sc (Hons) Zoology; B. Sc Zoology & Genetics*)
Environmental Assessment Practitioner & Water Use License Consultant

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ABBREVIATIONS

BAR	-	Basic Assessment Report
CoT	-	City of Tshwane
CTMM	-	City of Tshwane Metropolitan Municipality
DFFE	-	Department of Forestry, Fisheries, and the Environment
DPWI		Department of Public Works & Infrastructure
EA	-	Environmental Authorisation
EAP	-	Environmental Assessment Practitioner
EAPASA	-	Environmental Assessment Practitioners Association of South Africa
ECA	-	Environment Conservation Act
EIA	-	Environmental Impact Assessment
EMPr	-	Environmental Management Programme
EMZ	-	Environmental Management Zone
GDARD	-	Gauteng Department of Agriculture and Rural Development
GNR	-	Government Notice Number
GPEMF	-	Gauteng Province Environmental Management Framework
I&AP	-	Interested and Affected Party
IAIAsa	-	International Association for Impact Assessment South Africa
IDP	-	Integrated Development Plan
IEM	-	Integrated Environmental Management
Km ²	-	Square kilometres
m	—	Metre
m ²	—	Square Metres
m ³	—	Cubic Metres
mbgl	-	Meters Below Ground Level
mm	-	millimetre
MSDF	-	Municipal Spatial Development Plan
NEM: AQA	-	National Environmental Management: Air Quality Act
NEMA	-	National Environmental Management Act
NEMBA	-	National Environmental Management: Biodiversity Act
NEMWA	-	National Environmental Management: Waste Act
NFEPA	-	National Freshwater Ecosystems Priority Areas
NHRA	-	National Heritage Resources Act
NWA	-	National Water Act
PHRA-G	-	Provincial Heritage Resources Authority of Gauteng
RSDP	-	Regional Spatial Development Plan
SAHRA	-	South African Heritage Resources Agency
SDF	-	Spatial Development Framework
TIEP	-	Tshwane Integrated Environmental Plan
TOSF	-	Tshwane Open Space Framework
WCDoA	-	Western Cape Department of Agriculture

1. INTRODUCTION


1.1 Project Overview

SPOOR Environmental Services (PTY) Ltd. was appointed by CAPIC SA (PTY) Ltd. on behalf of the Department of Public Works and Infrastructure (DPWI) as the Environmental Assessment Practitioner (EAP) to apply for Environmental Authorisation (EA) for the proposed bulk water supply pipeline development as a Basic Assessment Process in terms of the NEMA, 2014 EIA Regulations is triggered. The pipeline installation is required in terms of the routine maintenance management planning as outlined in the Water System Master Plan for this area (Salvokop) of the City of Tshwane Metropolitan Municipality (CoT) (See Appendix 1). As part of the appointment SPOOR has also been tasked to develop a site-specific environmental management programme report, inclusive of a landscape rehabilitation plan to guide the construction and post-construction rehabilitation as well as the operational activities at the site (See Appendix 6).

1.2 Locality

The proposed pipeline site is situated to the Southwest of the Tshwane City Centre on the remainder of portion 406 of the Farm Pretoria Town and Townlands 351 -JR, Gauteng Province. Access to the property is gained via Koch Street which connects to the north of the site. See **Table 1** and Figure 1.

Table 1: Property details and Coordinates

Properties and Owners		
Property	Owner	SG Codes
Rem of Ptn 406 of the Farm Pretoria Town & Townlands 351 -JR	City of Tshwane Metro Municipality	T0JR00000000075000000
Site Coordinates		
	Decimal Coordinates of Proposed Pipeline	
Locality on site		
Start	S 25.766964°; E 28.185433°	
Point 1	S 25.766843°; E 28.185286°	
Point 2	S 25.766385°; E 28.185247°	
Point 3	S 25.766077°; E 28.185395°	
Point 4	S 25.765496°; E 28.185977°	
Point 5	S 25.765152°; E 28.186165°	
End	S 25.764647°; E 28.187227°	

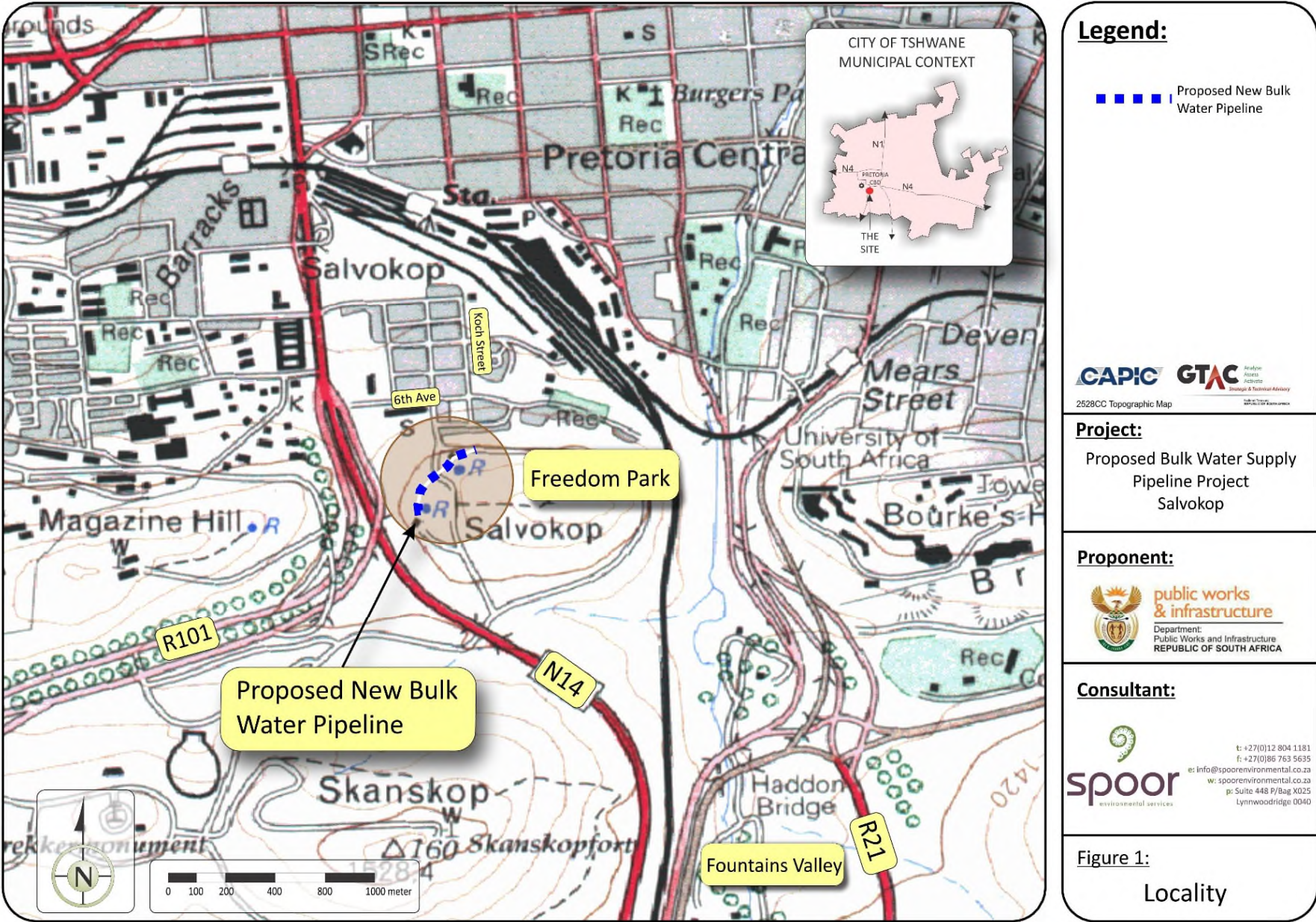
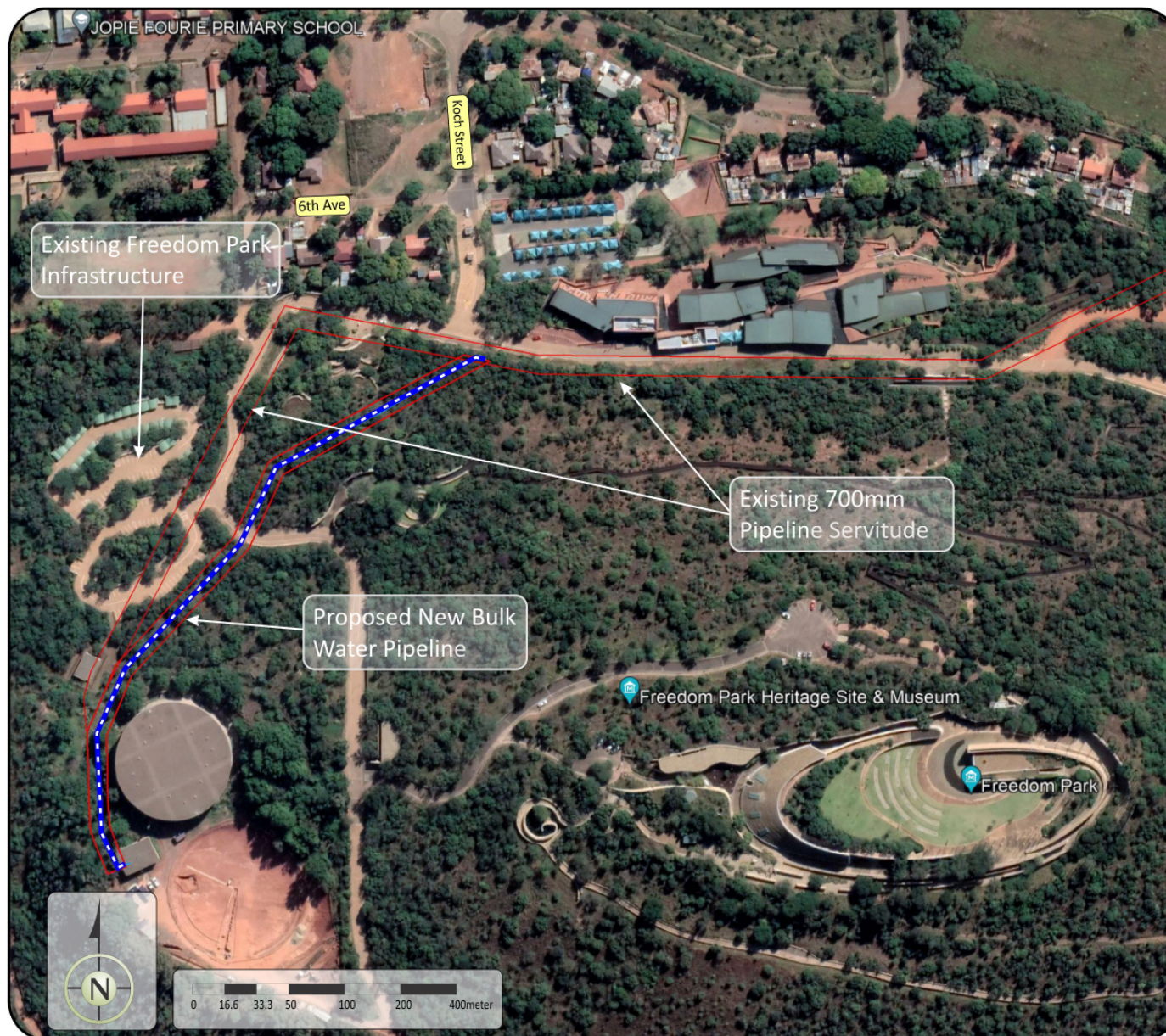


Figure 1: Locality of the Proposed New Bulk Water Pipeline



Legend:

 Proposed New Bulk Water Pipeline

CAPIC GTAC Analyse Assess Advise
Strategic & Technical Advisory
2528CC Topographic Map

Project:

Proposed Bulk Water Supply Pipeline Project
Salvokop

Proponent:

 **public works & infrastructure**
Department:
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Figure 1-1:

Locality (Aerial)

Figure 2: Proposed new Salvokop Bulk Water Supply Pipeline (blue) in relation to the existing pipeline to be decommissioned (red).

1.3 DESCRIPTION OF THE ACTIVITY

The current 700 mm diameter steel pipe from the Salvokop reservoir is approaching the end of its design life and an agreement has been reached between the City of Tshwane Metropolitan Municipality and the Department of Public Works that the existing 700 mm dia pipeline will be decommissioned and replaced by a new 850 mm diameter steel pipeline (see

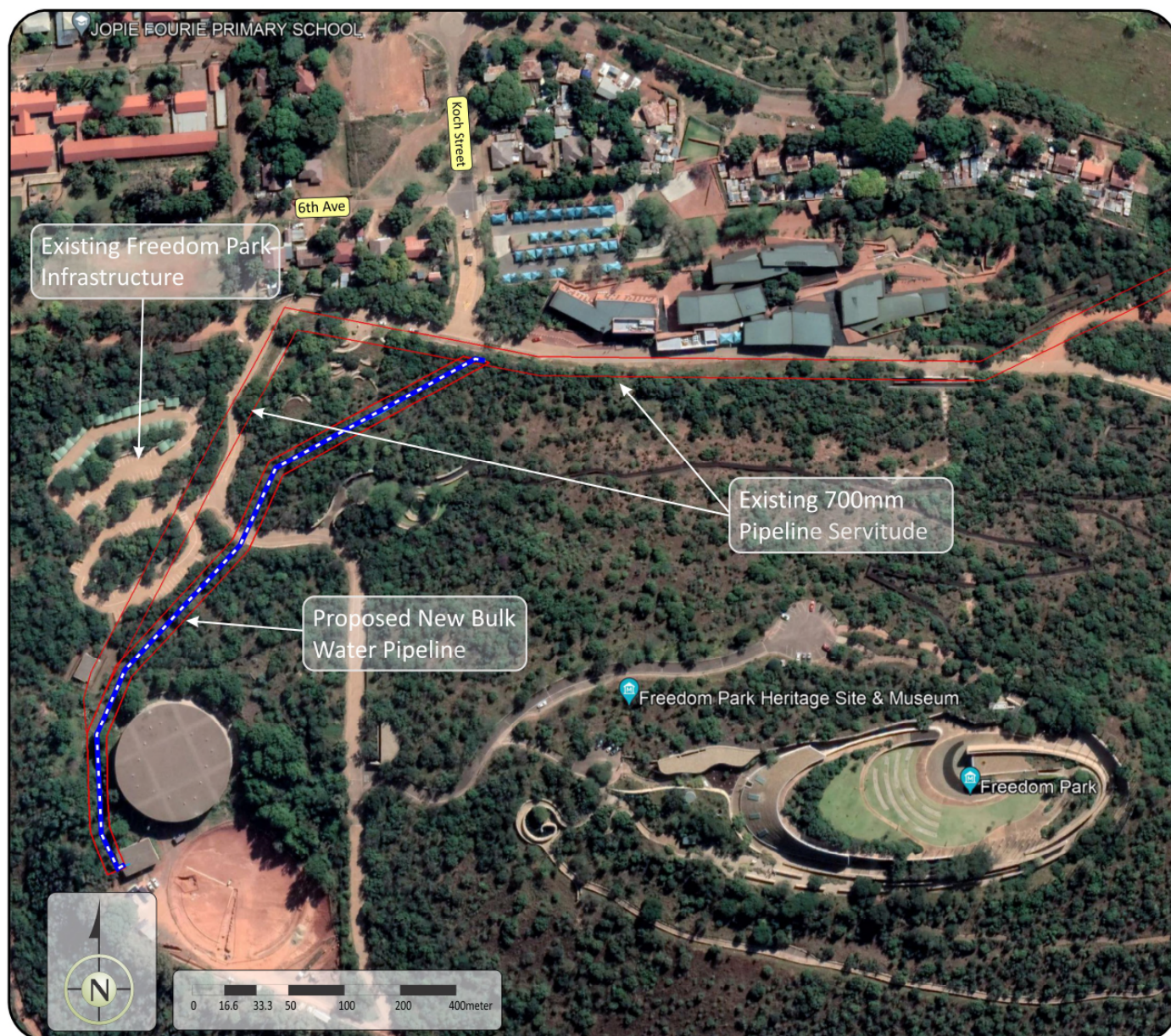


Figure 2), which will be sufficient to supply the entire Salvokop reservoir supply zone, i.e. the existing zone and the proposed Salvokop Government Precinct development. The proposed infrastructure includes;

- ❖ ± 365m bulk water pipeline of which ±250m falls outside of the existing servitude;
- ❖ Pipeline made of 8mm thick continuous welded steel pipe;
- ❖ Pipeline buried a minimum of 2m deep and placed on a 150mm sand bedding layer;
- ❖ Minimum cover of 1m over pipeline;
- ❖ ± 2m wide excavation in a 10m servitude;
- ❖ Associated pipeline infrastructure.

Construction Phase Activities:

- ❖ Site Camp establishment including site offices, materials, and equipment storerooms, material laydown areas, construction vehicle parking, sanitary facilities, and the fencing off, of the construction camp etc.;
- ❖ Site preparations for the start of construction including setting out of the construction areas by the land surveyor; traffic abatement and other statutory arrangements etc.

Construction Phase Facilities:

- ❖ Security fence around the construction camp;
- ❖ Site offices;
- ❖ Construction materials storerooms and laydown areas;
- ❖ Construction vehicle parking;
- ❖ Chemical Toilets;
- ❖ Waste collection area.

Operational Phase:

- ❖ See first paragraph above.

1.4 The needs and desirability of the proposed development (as per notice 792 of 2012, or the updated version of this guideline)

City of Tshwane Metro Municipality is the largest Metro in the Gauteng Province and is bordered by the North West, Limpopo, and Mpumalanga Provinces to the north west, north, and east respectively. The City of Johannesburg and Ekurhuleni Metro's forms the southern boundaries. The municipality covers an area of approximately 6 368 km² and has a population size of 13.2 million people. The Municipality is predominately urban in nature and its main economic sectors include public services, retail, business services, industrial and agriculture to a lesser degree. (<http://www.tshwane.gov.za>)

The City of Tshwane adopted its Integrated Development Plan (IDP) in 2019 which maps out the delivery agenda of the current term of office of the City for the period 2019/20. As part of the process of seven (7) service delivery regions were established, and the City embarked on a process to develop Regional Spatial Development Plans (RSDPs) which will complement the City-wide IDP. These plans are taking their guidance from the City's IDP but will relate it in more detail at regional level.

The proposed bulk water supply pipeline development that is part of this study is in planning region 3 and ward 80 of the CoT in terms of the (CoT, RSDP, 2019/2).

Region 3 is in the southeast of the city. The region is the host of several national government departments and forms the administrative heart of government. The CBD is the largest job opportunity zone in the CoT. Two of the three Gautrain stations are located within this region, i.e., Hatfield and Pretoria Stations. The region is also the focal point of Tshwane's 'knowledge economy' as it incorporates the bulk of tertiary and research institutions, relative to other regions. (CoT, MSDF, 2012).

From a service infrastructure point of view the area is generally well provided for. Rapid development is expanding towards the provincial urban edge. Nonetheless, future development may be subjected to future bulk infrastructure limitations. Unfortunately, further challenges exist in the fact that the CBD has lost its status as the focal point of commercial and office related activity within the metropolitan area. This is largely due to the development of several high order decentralised nodes. This has partially led to

a gradual process of urban decay within the CBD and surrounding areas. The demographics, income status and quality of the built environment vary greatly, with the more affluent areas being located east of the CBD and the less affluent areas being located west of the CBD. (CoT, MSDF, 2012).

The proposed pipeline development is deemed positive as it would provide in the bulk water infrastructure requirements aligning the land use with the required zoning in terms of the revised Tshwane Town Planning Scheme of 2014. This will allow the development of the properties to the north to its potential.

1.5 Methodology

The principles of NEMA (Act No. 107 of 1998) stress the importance of the conservation of the worlds and our country's natural and cultural heritage. It also stresses the fact that environmental management must place people and their needs at the forefront and serve their physical, psychological, developmental, cultural, and social interests equitably. This introduces an anthropocentric approach to environmental management and establishes the importance of a balanced view towards development and conservation.

The principles of IEM also include:

- ❖ the promotion of sustainable development;
- ❖ protecting natural environments;
- ❖ maintaining of an environment which is not harmful to people's health or well-being;
- ❖ an open participatory approach to impact assessment;
- ❖ the timeous consideration of environmental impacts before decisions on proposed developments are taken and;
- ❖ accountability for the potential impacts and the management of these impacts.

In short, this BAR will describe the following:

- ❖ The background to the project;
- ❖ The relevant legislation and guidelines that were considered in preparation of the EIA Report;
- ❖ a description of the property on which the proposed activity is to be located;
- ❖ a detailed description of the proposed scope of work;
- ❖ a description of the environment that may be affected by the project which will include all current physical, biological, social, economic, and cultural aspects of the receiving environment;
- ❖ details of the public participation process conducted;
- ❖ a description of all feasible and reasonable alternatives;
- ❖ identification of all physical, biological, social, economic, and cultural environmental impacts of the proposed development on the properties.

The image below illustrates the BAR process diagrammatically. At the time of submission of this report Phase 1 of the PPP was completed and the process was at the beginning of Phase 2. In Phase 2, comment will be requested on the Draft BAR and the responses on these comments and included in the Final BAR as well as any amendments to the BAR as a result of the public involvement process.

1.5.1 Phase 1: Pre-Application Public Participation (Phase 1) (See Appendix 5)

Interested and Affected Parties (&APs) were notified of the process by way of advertisements in the local newspapers (Daily Sun Newspaper on the 2nd of September 2022) (refer to Appendix 5_2) and via a site notice (refer to Appendix 5_1) placed on the site boundary in accordance with the requirements of the 2014 EIA Regulations.

I&APs adjacent to the development including local resident's associations, the ward Councillor and the relevant Public and State Departments were also notified and provided with Background Information Documents (BIDs) as per Appendix 5_3. The BID included a broad description of the detail as well as the contact details of the EAP, where stakeholders could obtain additional information regarding the proposed feedlot development.

The period for registration and comment on the project terminated on 3 October 2022. During this time the EAP responded to each comment and provided the information as requested. See Section 4.

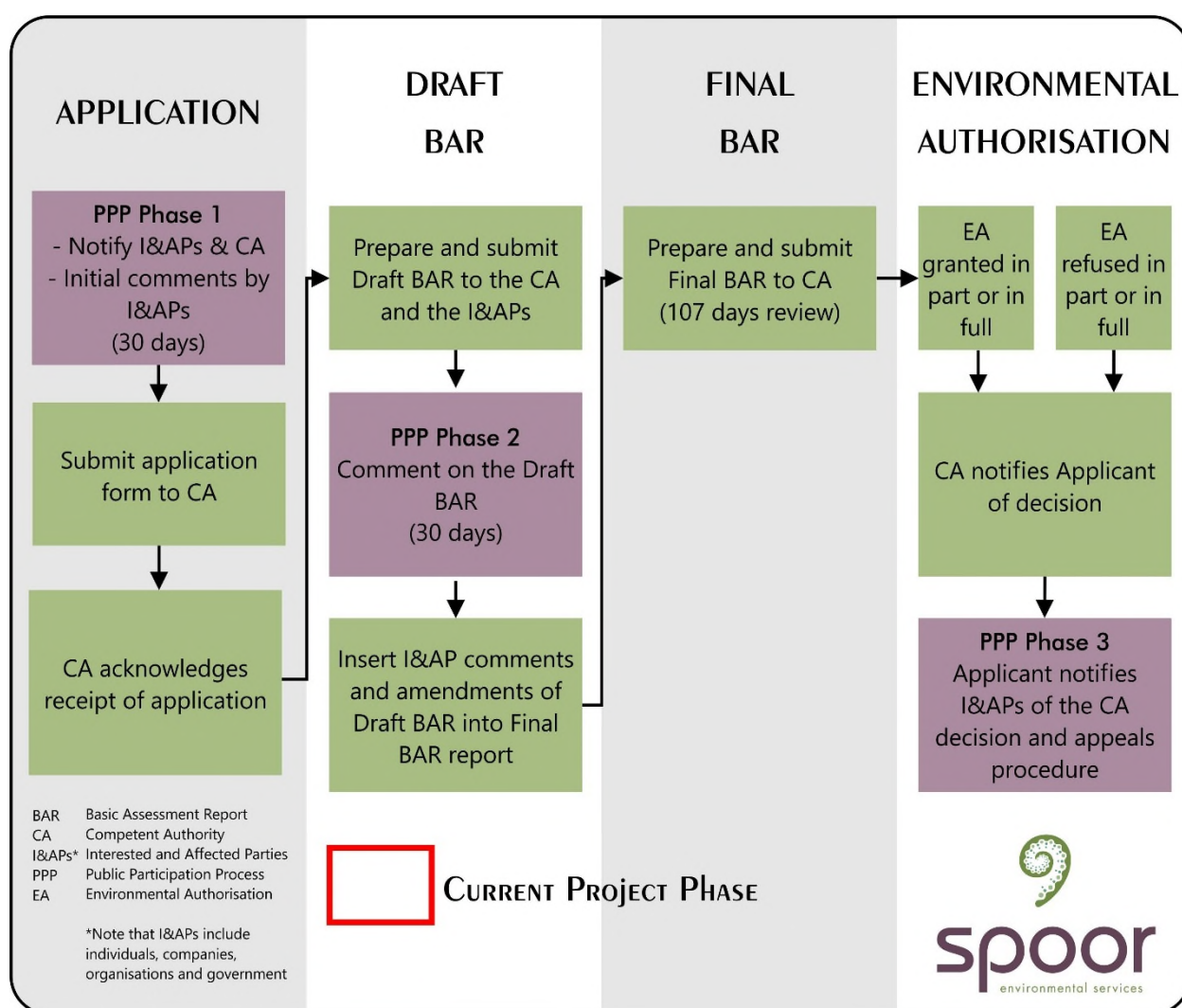


Figure 3: BAR Application Process

1.5.2 Phase 2: Draft BAR Comments

Phase 2 of the public participation process will include the distribution of the Draft BAR to all of the parties that registered as I&AP's during the first phase of public participation process. I&AP's will be given the regulated 30-day period to provide comment on the Draft BAR report.

1.5.3 Phase 3: Final BAR

All the comments received during the first phase and second phase public participation as well as the responses from the EAP will be included in the Draft BAR and redistributed to the registered I&AP's for further comments and review. These comments will then be included in the final BAR which will be submitted to the DFFE for review and authorization.

2. DESCRIPTION OF THE PROPOSED PROJECT

2.1 Introduction

The current 700 mm diameter steel pipe from the Salvokop reservoir is approaching the end of its design life and an agreement has been reached between the City of Tshwane Metropolitan Municipality and the Department of Public Works that the existing 700 mm dia pipeline will be decommissioned and replaced by a new 850 mm diameter steel pipeline, which will be sufficient to supply the entire Salvokop reservoir supply zone, i.e. the existing zone and the proposed Salvokop Government Precinct development. See Figure 2.

A registered servitude exists for the proposed pipeline, but the existing pipeline cannot be decommissioned while the new pipeline is installed. In addition, there is also tourism infrastructure on top of the existing servitude which necessitated an alternative route.

Approximately 4200m² of indigenous vegetation (280m x 10-15m wide= 4200m²) will be disturbed for the construction of the pipeline on a new alignment.

The proposed infrastructure includes;

- ❖ ± 365m bulk water pipeline of which ±250m falls outside of the existing servitude;
- ❖ Pipeline made of 8mm thick continuous welded steel pipe;
- ❖ Pipeline buried a minimum of 2m deep and placed on a 150mm sand bedding layer;
- ❖ Minimum cover of 1m over pipeline;
- ❖ ± 2m wide excavation in a 10m servitude;
- ❖ Associated pipeline infrastructure.

Construction Phase Activities:

- ❖ Site Camp establishment including site offices, materials, and equipment storerooms, material laydown areas, construction vehicle parking, sanitary facilities, and the fencing off, of the construction camp etc.;
- ❖ Site preparations for the start of construction including setting out of the construction areas by the land surveyor; traffic abatement and other statutory arrangements etc.

Construction Phase Facilities:

- ❖ Security fence around the construction camp;
- ❖ Site offices;
- ❖ Construction materials storerooms and laydown areas;
- ❖ Construction vehicle parking;
- ❖ Chemical Toilets;
- ❖ Waste collection area.

Operational Phase:

- ❖ See first paragraph above.

2.2 Site Access

Site access is gained via existing access road currently used to reach the Salvokop Reservoir and the Freedom Park Development.

2.3 Resource Use And Process Details

2.3.1 Waste, Effluent, and Emission Management

Solid Waste Management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
-----	----

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

± 55m ³

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

PLEASE NOTE:

The first phases of the Salvokop Ext 5 development (DFFE Ref No14 /12/16/3/3/2/590) are currently under construction. The proposed bulk water pipeline project will make use of this construction site camp facilities and now new facilities will be erected.

Construction waste will comprise mainly of excess spoil material from excavation and trenching activities, vegetation, construction material, general waste from site personnel, paints and solvents, wastewater, and sewage.

Spoil material will be re-used where possible (as backfill or erosion mitigation works) while excess spoil will need to be disposed of off-site. Spoil material will be hauled with tipper trucks to a predetermined spoil site (usually excavated) identified by the Contractor (off-site). On closing the spoil site, the area will be covered with a layer of topsoil and re-vegetated.

General waste will be kept in bins within the construction site and will be collected and disposed of on a weekly basis or failing this will be disposed of into a skip and transported to the nearest landfill site. Spent canisters for paints and solvents will be the responsibility of the respective Contractor dispose of at a suitably licensed landfill site or to subcontract to a specialist contractor.

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

- ❖ General waste that is not recyclable will be disposed of at the nearest municipal landfill site;
- ❖ Spoil material will be re-used as backfill material and excess will be disposed of at the nearest registered municipal dumping site;
- ❖ Hazardous waste (paint/fuels) will be disposed of at a suitably licensed hazardous waste handling facility or to subcontract to a specialist contractor.

Will the activity produce solid waste during its operational phase?

YES	NO
-----	----

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

0m ³

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

- ❖ Non-recyclables will be disposed of at licensed landfill site. (Construction Phase)

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

YES	NO
-----	----

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

- ❖ Construction phase solid waste will be disposed at the nearest registered municipal landfill site.
- ❖ Any possible construction phase hazardous waste (possible hydrocarbons) will be disposed of at a suitably licensed hazardous waste handling facility or to subcontract to a specialist contractor.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
-----	-----------

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	-----------

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

- ❖ Materials sourced from the site (topsoil) will be used for the site rehabilitation and landscaping post construction.
- ❖ The EMPr further specifies that waste generated during the construction phase should be sorted into the various categories (glass, paper, metals, and plastics) and the relevant local recycling contractors should be contacted to remove this waste on a weekly basis.
- ❖ The Sub Contractors must supply the principal construction Contractor with a monthly report indicating the types and volumes of waste removed from site. (See Appendix 6)

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
-----	-----------

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

0 m ³

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

YES	NO
-----	----

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

Yes	NO
-----	-----------

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

m ³

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

--

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
-----	-----------

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

If any wastewater is generated, this will be used for dust suppression, if possible.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

YES	NO
-----	-----------

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

m ³

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

YES	NO
-----	----

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

YES NO

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES NO

If yes, is it controlled by any legislation of any sphere of government?

YES NO

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

During construction, there will be localized release 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 are not anticipated.

2.3.2 Water Use

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

Municipal	Directly from water board	Groundwater	River, stream, dam, or lake	Other	The activity will not use water
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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:

N/A litres

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

YES NO

If yes, list the permits required

--

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

YES NO

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

YES NO

2.3.3 Power Supply

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

Construction phase:

Mobile generators will be used by the contractor where necessary. The generators will also be supplied and maintained by the contractor for the duration of its use.

Operational phase:

During operation power for the existing Salvokop Reservoir and infrastructure will be connected to the power grid as is the case at present.

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

Not applicable.

2.3.4 Energy Efficiency

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

Construction Phase:

- ❖ Best practice guidelines for sustainable development will be encouraged regarding use of fuels for electrical generators as well as the use of electricity on site (e.g., unnecessary lights and appliances being switched off on the construction site when not in use and after hours).
- ❖ Energy efficient lighting will be used at the site offices and facilities during the construction phase.
- ❖ Construction plant must be maintained to stay in peak condition in order to perform optimally without unnecessary fuel consumption or emissions.

Operational Phase:

- ❖ Lights & other - Energy efficient lighting consoles should be specified in the designs for downlighting (dispensing area and parking) and any other feature where feasible.

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

See above.

2 LEGISLATIVE FRAMEWORK

The following section includes the primary list of legislation which is deemed relevant to the development on all levels of government, including the constitutional, national, provincial, and local level. Although the aim was to be as comprehensive as possible the list does not represent a complete legal review as this falls beyond the scope of this project application. The responsibility remains with the Applicant to ensure compliance with the required relevant legislation.

2.4 The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)

The Constitution of the Republic of South Africa is the principal legal source of the Republic's legislative framework, including its environmental law. The Bill of Rights is fundamental to the Constitution of South Africa and in, section 24 of the Act, it is stated that:

Everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Given that environmental management is founded partly on the principles of public participation, Section 195 of the Constitution is of primary relevance. This section states that:

(1) Public administration must be governed by the democratic values and principles enshrined in the constitution, including the following principles: (a) (b) (c) (d) (e) People's needs must be responded to, and the public must be encouraged to participate in policy making. (f) Public administration must be accountable. (g) Transparency must be fostered by providing the public with timely, accessible, and accurate information (Government Gazette, 1996).

2.5 Environment Conservation Act, 1989 (ECA) (Act 73 of 1989)

The primary objective of the ECA is to provide for the effective protection and control of the environment. Subsequent to the promulgation of the Act in 1989, a number of key regulations governing EIA's and identified activities that may be detrimental to the environment have also been promulgated. Section 8 of the Regulations regarding activities identified under section 21(1) of the Environmental Conservation Act (73 of 1989) – General EIA Regulations states that:

After a plan of study for the environmental impact assessment has been accepted, the applicant must submit an environmental impact report to the relevant authority, which must contain; (a) A description of each alternative including particulars on (i) The extent and significance of each identified environmental impact; and (ii) The possibility for mitigation of each identified impact. (b) A comparative assessment of all the alternatives; and (c) Appendices containing descriptions of (i) The environment concerned; (ii) The activities to be undertaken; (iii) The public participation process followed, including a list of interested parties and their comments; (iv) Any media coverage given to the proposed activity; and (v) Any other information included in the accepted plan of study.

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

The purpose of the Environmental Impact Assessment Amendment Regulations of 2014 (amended by GN 517 w.e.f. 11 June 2021) is to:

“The purpose of these Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.”

The Act provides for the right to an environment that is not harmful to the health and well-being of South African citizens; the equitable distribution of natural resources, sustainable development, environmental protection, and the formulation of environmental management frameworks (Government Gazette, 1998).

2.6.1 Listed Activities Applicable to the Proposed Salvokop Bulk Water Supply Pipeline

The table below provides a summary of the listed activities specified in the EIA Regulations of June 2014 (amended in 2021) and which is applicable to the proposed development.

SPOOR Environmental Services Environmental Services has subsequently been appointed by the Applicant, as the independent Environmental Assessment Practitioner (EAP) to undertake this Environmental Impact Assessment process and to ensure compliance with all the relevant Environmental Legislation, Regulations and Guidelines.

Table 2: Listed Activities in terms of the June 2014 NEMA EIA Regulations

Listed Activity in terms of the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended and published in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)	Describe the portion of the proposed project to which the applicable listed activity relates.
<p>Listing Notice 3: Activity No. 12: <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i> <i>c. Gauteng</i> <i>ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;</i></p>	<p>A registered servitude exists for the proposed pipeline, but the existing pipeline cannot be decommissioned while the new pipeline is installed. In addition, there is also tourism infrastructure on top of the existing servitude which necessitated an alternative route. Approximately 4200m² (280m x 10-15m wide= 4200m²) of the pipeline will need to be constructed on a new alignment. The proposed new alignment is included in CBA and ESA areas which necessitates the Application.</p>

2.7 National Environmental Management: Biodiversity Act, 2004 (NEM:BA) (Act 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. In terms of the Biodiversity Act, the developer has a responsibility for:

- ❖ The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations),

- ❖ Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity,
- ❖ Limit further loss of biodiversity and conserve endangered ecosystems.

2.8 National Environmental Management: Air Quality Act, 2004 (NEM: AQA) (Act 39 of 2004)

In regulating air quality in South Africa, The NEM: AQA was introduced to protect the environment by introducing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development whilst promoting justifiable economic and social development. In addition, the act aims to provide national norms and standards for regulating air quality monitoring as well as air quality management and control. The list of activities included in General Notice 248 must be considered for any activities that produces emissions. The following passages of the act bare relevance;

Section 22: No person may without a provisional atmospheric emissions licence conduct an activity;

- (a) listed on the national list anywhere in the Republic; or
- (b) listed on the list applicable in a province anywhere in the province.

2.9 National Environmental Management: Waste Act, 2008 (Act 59 of 2008)

Act no 59 of 2008 provides for the control of waste management activities which have or is likely to have a detrimental effect on the environment. The act aims to;

- ❖ Reform the law regulating waste management in order to protect health and the environment by providing reasonable measures to prevent pollution and ecological degradation and for securing ecologically sustainable development,
- ❖ To provide for institutional arrangements and planning matters,
- ❖ To provide for national norms and standards for regulating the management of waste by all spheres of government,
- ❖ To provide for specific waste management measures,
- ❖ To provide for the licencing and control of waste management activities,
- ❖ To provide for the remediation of contaminated land,
- ❖ To provide for a national waste information system,
- ❖ To provide for compliance and enforcement, and
- ❖ to provide for all matters related to the above aspect.

Importantly the act furthermore includes requirements that stipulate that no person may commence, undertake, or conduct a waste management activity listed in the act unless a licence is issued in respect of that activity.

The proposed activity will not constitute the storage, treating, or processing of any waste. Waste will be disposed of as per **section 2.3.1** above.

2.10 Hazardous Substances Act (Act No. 15 of 1973)

The Hazardous Substances Act (15 of 1973) is regulated by the Department of Health. The Act and its regulations regulate the transportation of defined hazardous

2.11 National Heritage Resources Act, 1999 (NHRA) (Act 25 of 1999)

Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study be undertaken for:

- (a) construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;*
- (b) construction of a bridge or similar structure exceeding 50 m in length; and*
- (c) any development, or other activity which will change the character of an area of land, or water –*
 - (1) exceeding 10 000 m² in extent;*
 - (2) involving three or more existing erven or subdivisions thereof; or*
 - (3) involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or*
 - (d) the costs of which will exceed a sum set in terms of regulations; or*
 - (e) any other category of development provided for in regulations.*

A Phase 1 Cultural Heritage Impact Assessment and a Desktop Study (Phase 1) Paleontological Impact Assessment were completed and submitted on SAHRIS for comment from the Provincial Heritage Resources Authority of Gauteng (PHRA-G).

2.12 Municipal Systems Act, 2000 (Act 32 of 2000)

The Municipal Systems Act form part of a string of other legislation which aims at empowering local government to fulfil its constitutional obligations. As part of this objective the SA government published the Local Government White Paper in 1998, which outline the policy framework for local government structures. In addition, government furthermore published the Municipal Demarcation Act, 1998 (Act 27 of 1998) which allowed for the demarcation of new municipal boundaries, the Municipal Structures Act, 2000 (Act 33 of 2000) which outlines the required structures of a local authority and the Municipal Financial Management Act, 2003 (Act 56 of 2003) which must secure sound and sustainable management of the fiscal and financial affairs of municipalities and municipal entities by establishing norms and standards and other requirements for the lawful financial management of these entities.

The Municipal Systems Act work in unison with these sets of legislation by regulating key municipal organizational, planning, participatory and service delivery systems. In combination these sets of legislation provide a framework for the democratic, accountable, and developmental local government system as envisaged by the Constitution.

2.13 Integrated Environmental Management

The term Integrated Environmental Management (IEM) has been used in South Africa since the 1980's. Documentation on how IEM would assist the EIA process was originally produced in 1992 by the then National Environmental Management Competent Authority. The need has since arisen for more comprehensive inputs in the EIA process, and this paved the way for the development of the Integrated Environmental Management Series in 2002 which consisted of a set of booklets providing more detailed insights in the approach and methodologies associated with EIA. In brief the IEM seeks to achieve the following;

“Integration of environmental considerations across the full lifecycle of the activity: for example, for a project this implies consideration of environmental issues through pre-feasibility, feasibility, planning and design, construction, operation and decommissioning” (DEAT 2002).

2.14 Occupational Health and Safety Act, 1993 (Act 85 of 1993)

The Occupational Health and Safety Act, 1993 (Act 85 of 1993) provides for the health and safety of individuals in the workplace as well as for the health and safety of individuals working near or with of plant and machinery. The Act also protects people, other than persons at work, against hazards to health and safety due to the activities of people at work.

2.15 Sustainable Development

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa (108 of 1996) and given effect by NEMA and the ECA. Section 1(29) of NEMA states that sustainable development means the integration of social, economic, and environmental factors into the planning, implementation, and decision-making process so as to ensure that development serves present and future generations. Thus, Sustainable Development requires that:

- ❖ The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- ❖ That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- ❖ That waste is avoided, or where it cannot be altogether avoided, minimised, and re-used or recycled where possible and otherwise disposed of in a responsible manner
- ❖ That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions;
- ❖ Negative impacts on the environment and on people's environmental rights be anticipated; and, prevented and where they cannot altogether be prevented, are minimised and remedied.

2.16 Regional Policies

The following Regional strategies were considered;

2.16.1 Gauteng Urban Edge 2010

The study area is located inside the Gauteng Environmental Management Zone (EMZ) Zone 1 (i.e., the urban development zone), and Zone 5 is not applicable to the study area. While the EMZ refers to Zones 2, 3, and 4, the spatial datasets for these zones are not available from egis.environment.gov.za, and therefore the applicable EMZ for the study area could not be determined. The EMZ Zone 1 boundary corresponds to that of the GDARD C-Plan Urban Edge, which indicated that the study area is located inside of the Urban Edge.

In terms of the RSDF policy document, as adopted by the City of Tshwane Metropolitan Municipality, the proposed infrastructure is situated within the latest Urban Development Boundary and the essential services provided thereby can be made readily available for the proposed new developments in the area.

2.16.2 Gauteng Provincial Environmental Management Framework:

The Gauteng Department of Agriculture and Rural Development (GDARD) decided to produce an Environmental Management Framework for the whole of Gauteng (GPEMF). The GPEMF replaces all other EMFs in Gauteng except for the Cradle of Humankind World Heritage Site which is incorporated within

the GPEMF. The objective of the GPEMF is to guide sustainable land use management within the Gauteng Province. (GDARD, 2014). The GPEMF, inter alia, serve the following purposes:

- ❖ To provide a strategic and overall framework for environmental management in Gauteng;
- ❖ Align sustainable development initiatives with the environmental resources, developmental pressures, as well as the growth imperatives of Gauteng;
- ❖ Determine geographical areas where certain activities can be excluded from an EIA process; and
- ❖ Identify appropriate, inappropriate, and conditionally compatible activities in various Environmental Management Zones in a manner that promotes proactive decision-making.
- ❖ The pipeline site is located north of the Urban Development Zone 1 where infill, densification and concentration of development is encouraged.

2.16.3 Tshwane Metropolitan Spatial Development Framework (MSDF) - Administrative Region 3

The site falls within Region 3 of the City of Johannesburg Metropolitan Municipality, Gauteng Province.

The estimated population of the region is 394 000, representing 14 percent of the population of Greater Johannesburg. It is composed of 87 percent black, 11 percent white, 1 percent Indian and 1 percent coloured people, mostly between 17 and 35 years old. The extremely low percentage (less than 5 percent) of children and the elderly highlights the transient nature of the inhabitants of Alex.

As described above, the MSA determines that a municipality must adopt a framework for integrated development in its area in the form of an IDP. A Spatial Development Framework, (SDF) which guides and informs all development in a municipality forms part of the IDP (Section 35 (2)). In addition, the Gauteng Planning and Development Act, 2003 (Act 3 of 2003) determines that municipalities must formulate spatial development frameworks for their areas (Section 31 and 32).

In terms of the above, the proposed bulk water pipeline development falls within the southern sections of Area 3 about the CoT MSDF. The development area is clearly demarcated in terms of its biodiversity category, proposed local nodes and transport corridors, proposed rural community service centres and related urban development requirements. (CoT MSDF)

2.16.4 Gauteng Ridges Policy

The following was taken from the Terrestrial Biodiversity Compliance Statement undertaken by The Biodiversity Company in May 2022 (Appendix 4):

“The quartzite ridges of Gauteng are one of the most important natural assets in this northern province of South Africa. This is because these ridges, and the areas immediately surrounding them, provide habitat for a wide variety of fauna and flora, some of which are Red Listed, rare, or endemic species or, in the case of certain plant species, are found nowhere else in South Africa or around the world.

In order to give practical effect to this policy, the Gauteng Department of Agriculture and Rural Development (GDARD) has classified all ridges in Gauteng into one of four classes, based on the existing extent and percentage of area converted by urban development or disturbed by other human activities. The project area occurs on the ‘Class 2’ Salvokop ridge, a ridge of which more than 5%, but less than 35%, of its surface area has been converted by urban development activities (Figure 4).

According to The Ridges Guideline (GDARD, 2019), only low impact development activities, such as tourism facilities, which comprise of an ecological footprint of 5% or less of the

property may be supported. (The ecological footprint includes all areas directly impacted on by a development activity, including all paved surfaces, landscaping, property access and service provision)."

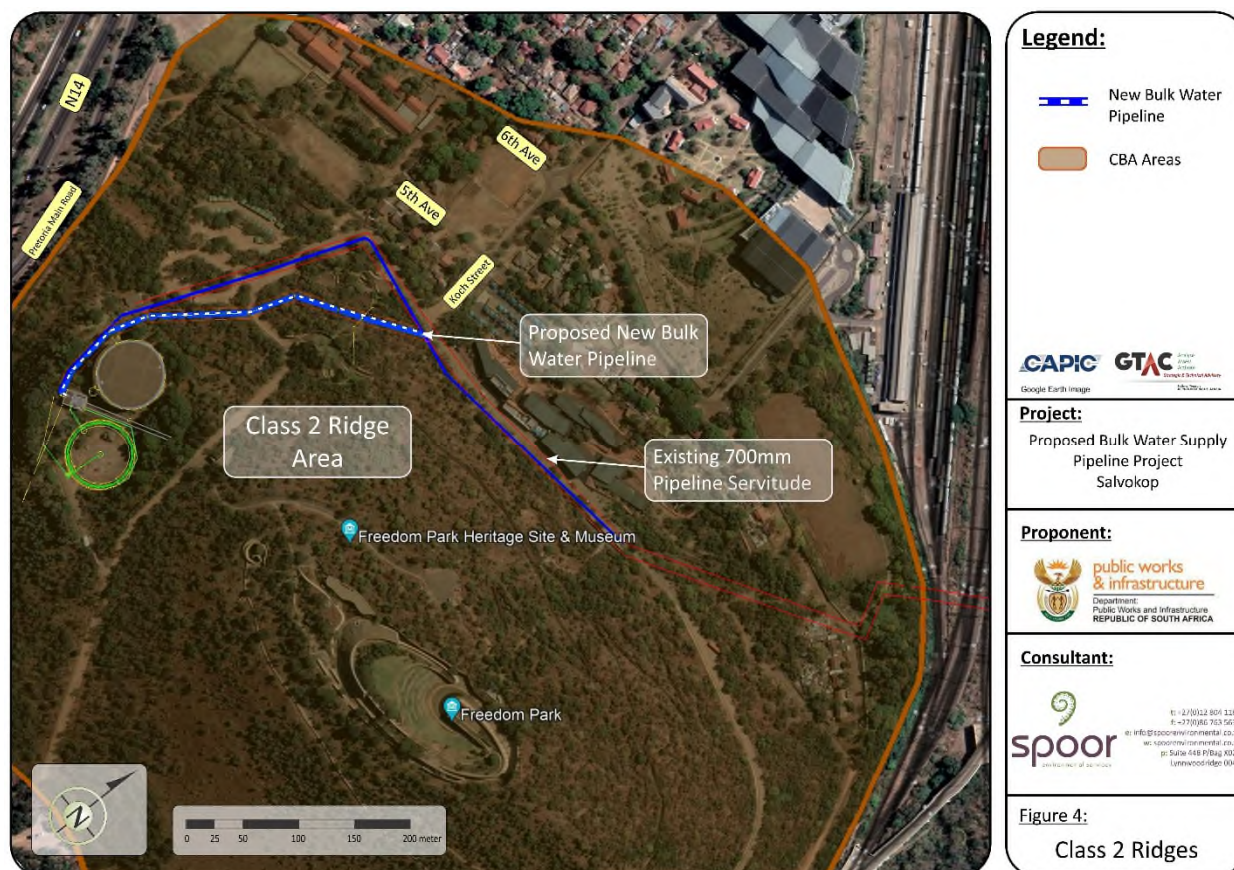


Figure 4: The project area superimposed on the 2019 Gauteng Ridges dataset

2.16.5 Tshwane Open Space Framework

The CoT has been facing the challenges of sustainable urban development for many years. In 2010, 13 municipalities within the functional area of Pretoria were amalgamated to form the City of Tshwane Metropolitan Municipality (CTMM). This has enlarged the local government's jurisdiction to one of the largest in the world covering 220 000ha. This has necessitated the CoT to develop an integrated Open Space policy framework that applies to its entire area of jurisdiction and that can address the sustainable utilisation and integration of Open Spaces within a context of rapid population growth, urban sprawl, poverty and dwindling financial resources. In order to facilitate the above, a series of open space typologies were developed that would describe a spatial conceptualisation of the open space network. (CoT TOSF, 2005).

Open Space as defined by the Tshwane Open Space Framework (TOSF), adds ecological, social, economic and place making value to any development, and the integration and appropriate response of development to Open Space must at all times be facilitated. Any development within or adjacent to the TOSF network, must be compatible to the functioning, quality, safety requirements and aesthetics of the Open Space in terms of land use, scale, spatial interaction, appearance, and landscaping. Developments must actively contribute to the protection and enhancement of the current and envisioned open space network, without harming the integrity of the open space in any way.

According to the TOSF, open space within a developed area, is referred to as an Urban Environment. This open space becomes Private Open Space, for the exclusive use of the specific community, and is owned and maintained by the representative entity of the development. The Tshwane Open Space Framework provides a holistic Framework within which the sustainable spatial development of the City can be guided and directed. The principles of the TOSF will be taken into account during construction of the proposed bulk water supply pipeline in the planning phases.

2.16.6 Tshwane Integrated Environmental Management Plan

The City of Tshwane Metropolitan Municipality (CTMM) incorporates a diversity of land uses, including residential (rural and urban), agricultural, natural open spaces and industrial and commercial areas within an area of about 2 200 km². The area is rich in natural, cultural, and historical resources but is also faced with a number of problems, such as redressing past inequity and apartheid legacies, the need for housing, pollution by industries and communities, unemployment, and poor service delivery.

The growing needs of the increasing population in Tshwane have resulted in a growing demand for development. The CTMM recognises that, although development must be economically and socially acceptable, it is imperative that the development challenges facing Tshwane be addressed in an environmentally sustainable manner.

The development of the TIEP is a further demonstration of the commitment of the people of Tshwane towards sustainable development and the protection of the environmental resources of the area.

Overarching goals, objectives and policy statements of the TIEP have been identified as:

- ❖ Environmental governance
- ❖ Spatial development planning
- ❖ Economic development
- ❖ Social development
- ❖ Environmental awareness and education
- ❖ Environmental resource management
- ❖ • Environmental health management

The proposed bulk water supply pipeline will be in line with the above identified goals and the related objectives as set out in TIEP.

3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

BIO-PHYSICAL ENVIRONMENT

3.1 Climate

The climate is typical of Highveld conditions, with relatively warm to hot summers, with fairly high rainfall and moderate to cool winters with little or no rain. Valleys and wetlands are much cooler at night and more prone to frost than higher lying areas. The area experiences thunderstorms, which usually occur in the late afternoons during the summer months. The project area falls within the summer rainfall area, with the majority of rain falling within the months of October to March (SEC, 2016).

3.2 Topography

As per the Salvokop Township Establishment EIAR, with EA issued 15 December 2016 (Ref.:14/12/16/3/3/2/590) , EA Amendment issued 13 February 2017 under reference number 14/12/16/3/3/2/590/AM1 (with the relevant section related to the development area for the pipeline underlined):

“The topography of the property can be described as undulating and relatively steep in the south of the property and gentle in the centre and northern parts of the property. “

Spoor Environmental conducted a desktop slope analysis in respect of the property and the pipeline area. This study clearly indicates the presence of steep slopes in the southern section of the proposed pipeline and a gentle to moderate slope for the rest of the pipeline. See **Figure 5 & Figure 6**.



Figure 5: Map Indicating the Site Topography



Figure 6: Slope Along the Proposed Bulk Water Pipeline Route

3.3 Geology and Soils

According to the Map data from Council for Geoscience, sourced on CapeFarmMapper the study area is classified as Timeball Hill And Rooihogte Formations. This formation is classified by Mudrock, quartzite (ferruginous in places), wacke, chert breccia, minor diamictite, conglomerate, shale, magnetic ironstone. (WCDa, 2022).

The Palaeontologist Specialist indicated the following (See **Figure 7**):

“The project lies in the Transvaal Basin of the Transvaal Supergroup where only a few of the many formations are present. Considerably younger Quaternary alluvium and sands occur in river valleys”.

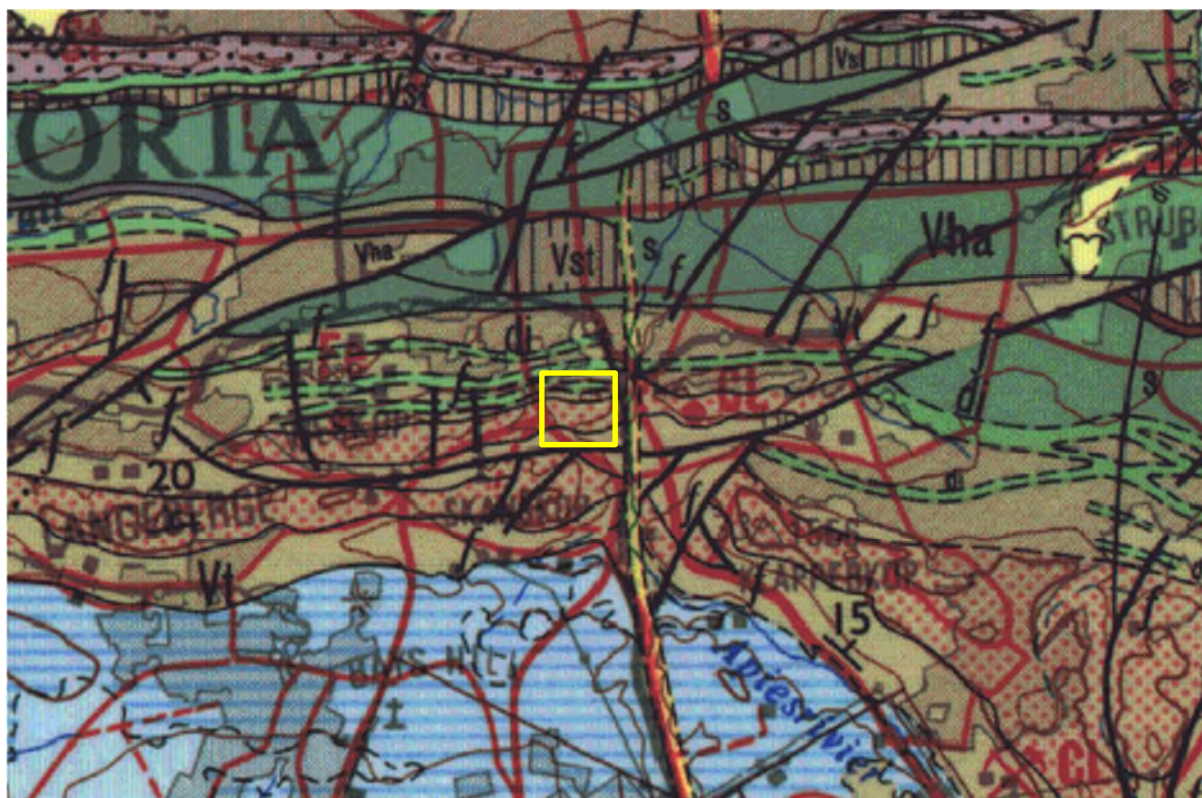


Figure 7: Geological Map of the Area Around the Salvokop Reservoir and Proposed Pipeline Indicated within the Yellow Rectangle. Abbreviations of the rock types are explained in Table 3. Map enlarged from the Geological Survey 1: 250 000 map 2528 Pretoria.

Table 3: Explanation of symbols for the geological map and approximate ages (Eriksson et al., 2006. Johnson et al., 2006; Zeh et al., 2020). SG = Supergroup; Fm = Formation; Ma = million years; grey shading = formations impacted by the project.

Symbol	Group/Formation	Lithology	Approximate Age
Q	Quaternary	Alluvium, sand, calcrete	Quaternary, ca 1.0 Ma to present
Vdi	Diabase	Intrusive volcanic dykes and sills	Post Transvaal SG
Vst	Strubenkop Fm, Pretoria Group, Transvaal SG	Shale, in places ferruginous	Ca 2242 Ma
Vha	Hekpoort Fm, Pretoria Group, Transvaal SG	Volcanic rocks	Ca 2224 Ma
Vt	Timeball Hill Fm Pretoria Group, Transvaal SG	Shale, siltstone, conglomerate in places; dotted = Quartzite	Ca 2316 – 2266 Ma
Vmd	Malmani SG, Chuniespoort Group, Transvaal SG	Dolomite, chert	Ca 2585 – 2480 Ma

3.4 Surface Water

As per the Salvokop Township Establishment EIAR, with EA issued 15 December 2016 (Ref.:14/12/16/3/3/2/590) , EA Amendment issued 13 February 2017 under reference number 14/12/16/3/3/2/590/AM1 (with the relevant section related to the development area for the pipeline underlined):

No water bodies are located within the boundaries of the study area. The hydrological map for the study area is represented in Figure 11.

The map indicates the Apies river is located 220m East of the proposed pipeline.



Figure 8: Hydrology map of Salvokop area as per Salvokop Township Establishment EIAR, with EA issued 15 December 2016 (Ref.:14/12/16/3/3/2/590) , EA Amendment issued 13 February 2017 under reference number 14/12/16/3/3/2/590/AM

Furthermore, the Salvokop Township Establishment EIAR states:

“Scientific Aquatic Services (SAS) was appointed to conduct a wetland verification assessment on the study area. A site investigation was undertaken to verify if any wetland areas are present, which would pose a constraint to the development of the study area. SAS determined the following:

- 1. Consultation of South Africa’s 1:50 000 topographic maps indicate that the study contains no drainage lines or any other watercourses.*
- 2. Analysis of the National Freshwater Ecosystem Priority Areas (NFEPA) database of 2011, indicates that no wetland areas or waterbodies are present on the study area.*
- 3. The Gauteng Department of Agriculture and Rural Development (GDARD) C-Plan (Version 3.3) does not indicate any wetlands or similar ecological features on the study area.*

4. During the site assessment, the study area was investigated in order to determine whether the study area contains any features which may be classified as wetlands. The study area is situated in an urban area with urban development comprising the dominant land-use.

3. The dominant vegetation consisted of terrestrial species and alien invasives. No vegetation associated with wetlands or riparian areas was encountered, indicating that insufficient water is present to support vegetation typically adapted to life in saturated soil as per the definition of a wetland according to the National Water Act (NWA) (Act 36 of 1998) and the National Environmental Management Act (NEMA) (Act No. 107 of 1998).

4. No soils indicative of wetlands (such as gleyed soils or mottled soils) are present on the study area.

5. Based on the above findings, it is the opinion of the wetland ecologist that no wetlands are present on the study area or the immediate surroundings; nor are there features which support the presence of saturated soils for long enough periods; for facultative or obligate wetland vegetation to become established.”

3.5 Vegetation and Animal Life

3.5.1 Desktop Assessment

Ecological Importance and Flora Assessment

Site specific ecological investigations or a Terrestrial Biodiversity Compliance Statement was undertaken by The Biodiversity Company in May 2022. This is included in Appendix 4. The project area is situated within the Savanna Biome and on a fine-scale vegetation type, the project area is classified as Gauteng Shale Mountain Bushveld.

The desktop assessment indicates that the development area overlaps with an Ecosystem Threat Status that is Least Concern, and the Ecosystem Protection Level is classified as Poorly Protected. In terms of Critical Biodiversity Areas and Ecological Support Areas, according to the Gauteng Conservation Plan, the project area overlaps with equal portions of CBA and ESA area.

According to the 2021 SAPAD and SACAD datasets, the project area is within 5 km of several protected areas as well as the Magaliesberg Biosphere Reserve (Figure 6-3). The closest protected area is the small Groenkloof National Park, just over 1 km east of the project area.

National Protected Area Expansion Strategy 2016 (NPAES) areas were identified through a systematic biodiversity planning process and the project area overlaps with priority focus areas for expansion according to the 2016 NPAES dataset. No Important Bird and Biodiversity areas overlap the development areas (The Biodiversity Company, 2022).

Faunal Assessment

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, IUCN Digital Distribution Maps (IUCN, 2016), and the Animal Demography Unit (ADU, 2020) databases 311 bird species have the potential to occur in the vicinity of the project area. The IUCN Red List Spatial Data (IUCN, 2017), and other references, lists 140 mammal species, 132 reptile amphibian species have the potential to occur in the project area (The Biodiversity Company, 2022).

3.5.2 Fieldwork findings

Flora Assessment

As stated in the Terrestrial Biodiversity Compliance Statement, Appendix 4:

“The majority of the project area was found to be significantly impacted by dense Invasive Alien Plant (IAP) growth and the related edge effects from nearby current and historical development activities. No portions of the project area were found to be representative of intact Gauteng Shale Mountain Bushveld vegetation nor CBA area.

*The most prominent indigenous vegetation recorded included stands of young-mature *Searsia leptodictya*, *Pappea capensis*, and *Combretum molle* trees, interspersed with *Vangueria infausta*, *Euclea crispa*, and *Gymnosporia buxifolia* shrubs/small trees. Sparse populations of *Aloe* and *Asparagus* spp. were also noted.*

*The herbaceous layer was however dominated by numerous IAP species, the most problematic of which included *Lantana camara*, *Salvia tilifolia*, *Verbena bonariensis*, *Tithonia rotundifolia*, *Solanum mauritianum* and *S. seafortianum* (all category 1B invasive species as per NEMBA). Common exotic weeds were also found to be prolific in many sections, including *Tagetes minuata* and *Bidens pilosa*.*

*Pioneer and exotic grasses were common throughout, and more common IAPs were recorded nearby to roadways and historical development areas, such as *Campuloclinium macrocephalum*, *Leucaena leucocephala*, *Agave* sp., *Ipomoea* sp., *Pinus* sp. and *Eucalyptus* sp.*

No protected trees or SCC flora species were observed; however, it is suspected that these species may occur in certain sections of the less disturbed north and south - eastern portions of the ridge property. (The Biodiversity Company, 2022).

Faunal Assessment

As stated in the Terrestrial Biodiversity Compliance Statement, Appendix 4.

*“The mature indigenous trees occurring throughout the area provide ample forage and nesting opportunities for local avifauna, although the degraded state of the herbaceous layer limits this – particularly for seed eaters and ground-based birds. Several common species were recorded during the field survey, including *Laniarius ferrugineus* (Southern Boubou), *Prinia subflava* (Tawny-flanked Prinia), and *Colius striatus* (Speckled Mousebird).*

*Mammal and herpetofauna activity were low, despite the extensive rocky ridge microhabitat present (found to be degraded and impacted). *Sylvicapra grimmia* (Common Duiker) scat was recorded, and common small mammal and reptile species are expected to frequent the ridge.*

No fauna SCC were recorded, and none are expected to occur within the project area.” (The Biodiversity Company, 2022).

3.5.3 Habitat Assessment and Site Ecological Importance

As stated in the Terrestrial Biodiversity Compliance Statement, Appendix 4:

“The main habitat types identified across the project area were initially identified and pre-delineated largely based on aerial satellite imagery. These habitat types were then refined based on the field coverage and data collected during the survey. Two habitat units are delineated for the project area: degraded bushveld ridge and transformed.

The degraded bushveld ridge habitat was comprised of a dense to open tree layer, largely dominated by indigenous trees and shrubs common to the region, and a dense IAP

herbaceous layer, dominated by numerous species of aggressive weeds and listed invasive species (Figure 6-13). The habitat unit was impacted by direct edge effects from the nearby development activities, including old water infrastructure and related materials, clearing activities and erosion, as well as rubble/general waste dumping. The extensive rocky outcrops, characteristic of a highveld ridge, in addition to the dense populations of indigenous trees, add to this habitat's sensitivity in spite of the numerous negative ecological impacts present.

The transformed sections of the area consisted of the large existing reservoir and the construction footprint of the new reservoir, as well as the existing roads and pathways throughout the property. No functional vegetation was recorded within any of the transformed areas, as even the adjacent vegetation communities were comprised of dominant stands of exotics and IAPs.

Based on the criteria provided in section 4.5 of this report, the two delineated habitat types have each been allocated a sensitivity category, or SEI, and this breakdown is presented in Table 6-4 below. In order to identify and spatially present sensitive features in terms of the relevant specialist discipline, the sensitivities of each of the habitat types delineated within the project area are mapped in Figure 6-14.

It is important to note that this map does not replace any local, provincial, or national government legislation relating to these areas or the land use capabilities or sensitivities of these environments.

Consider the following guidelines when interpreting SEI in the context of any proposed development or disturbance activities:

- *Very Low: Minimisation mitigation - Development activities of medium to high impact acceptable and restoration activities may not be required.*
- *Medium: Minimisation and restoration mitigation - Development activities of medium impact acceptable followed by appropriate restoration activities.*

The terrestrial biodiversity theme sensitivity as indicated in the screening report (compiled by the National Web based Environmental Screening Tool) was derived to be 'Very High' (Figure 6-15), mainly due to the CBA status of the area.

The completion of the terrestrial desktop and field studies disputes the 'Very High' sensitivity presented by the screening report. As discussed above, the project area is largely degraded and as such is assigned a sensitivity rating of 'Very Low' to 'Medium', and the CBA status is no longer considered to be relevant as far as it pertains to the current state of the project area.

The screening report classified both the animal and plant species theme sensitivities as being of a 'Medium' sensitivity. Following the field survey findings, both the animal and plant species themes may be re-classified as having 'Low' sensitivities. This is due to the fact that there is little suitable habitat available to support the regular occurrence of any faunal SCC within the project area, and the heavy invasion of IAPs limits the likelihood of flora SCC occurring.

Site specific environmental management measures are included in the Environmental Management Programme (EMPr) to limit and reduce activities that could cause harm to faunal and floral species. See Appendix 6.

3.6 Cultural Heritage

A Phase 1 Cultural Heritage Impact Assessment was undertaken by J A van Schalkwyk in May 2022 (see Appendix 4). This report will be submitted via the South African Heritage Resources Agency (SAHRA) or

relevant Provincial Heritage Resources Agency (PHRA) by means of the online SAHRIS System. The report states the following:

“The Palaeontological Sensitivity Map (<http://www.sahra.org.za/sahris/map/palaeo>) indicate that project area (Fig. 7) has a high sensitivity of fossil remains to be found and therefore a desktop palaeontological study is required. Based on the outcome of the desktop study, a field assessment is likely.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of limited Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component, which eventually gave rise to an urban component.

During the survey, the following sites, features, and objects of cultural significance were identified in the project area

Stone Age

No sites, features or objects of cultural significance dating to the Stone Age were identified in the project area.

Iron Age

No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

Historic Period

No sites, features or objects of cultural significance dating to the historic period were identified in the project area.

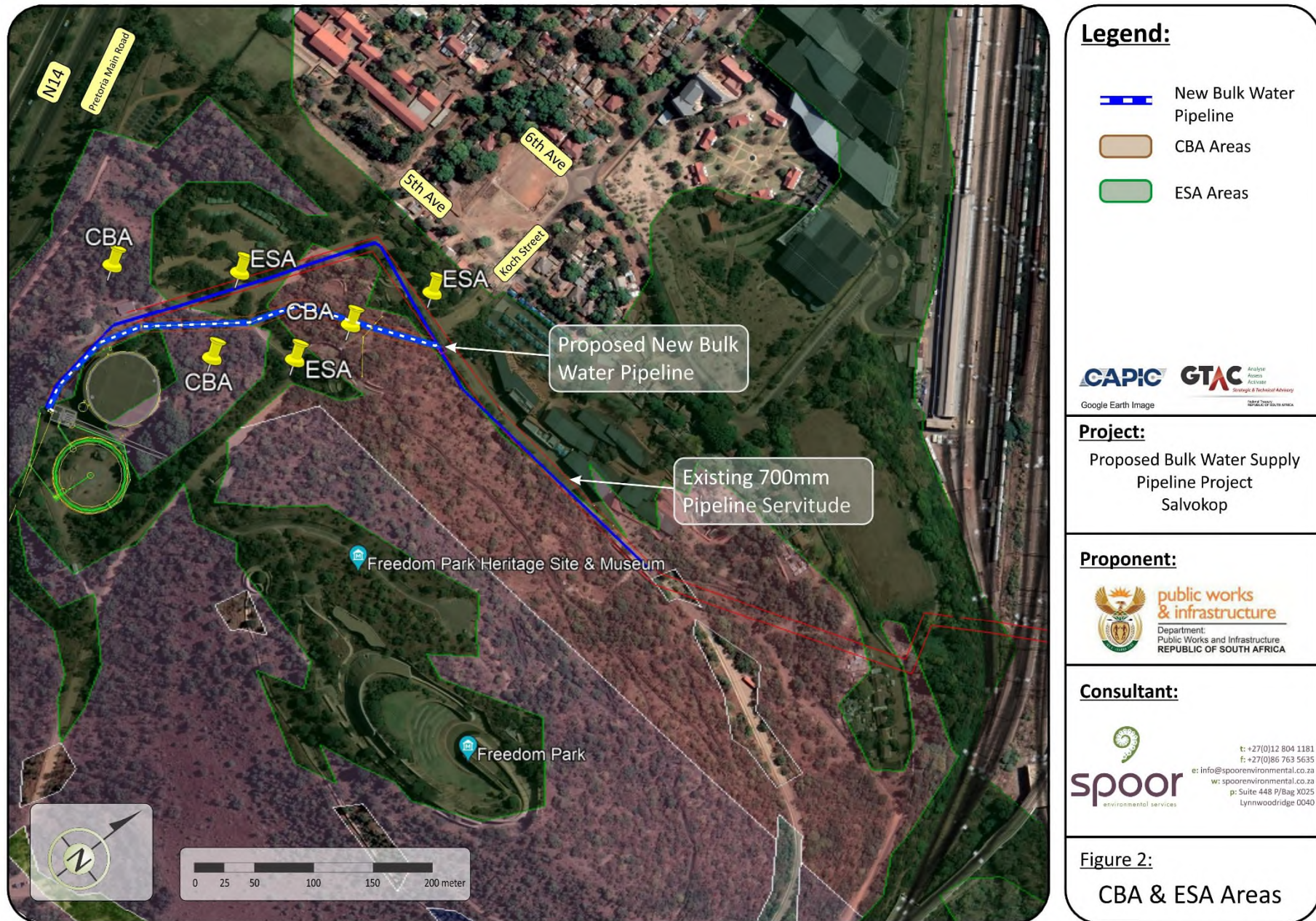


Figure 9: Site Ecological Sensitivity

3.7 Palaeontological Background

A Phase 1 Paleontological Impact Assessment was undertaken by Prof Marion Bamford in September 2022 (see Appendix 4). This report will be submitted via the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Agency (PHRA) by means of the online SAHRIS System. The report states the following:

The proposed site lies on the shallow to deep water high energy shales of the Silverton Formation (Pretoria Group, Transvaal Supergroup) that are about 2250 million years old, and on outcrops of diabase (volcanic so no fossils). None of the geological literature indicates the presence of any stromatolites but the Palaeotechnical Report for Gauteng Province does. Although there is an extremely small chance that stromatolites or microbialites (microbial features) are present, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer, or other designated responsible person once excavations or drilling activities have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

From the SAHRIS map above the area is indicated as highly sensitive (orange) and this applies to the Timeball Hill Formation quartzites that might preserve microbial features according to the Palaeotechnical report for Gauteng (Groenewald et al., 2014). From the geology, however, this seems highly unlikely. Diabase (grey) is an intrusive volcanic rock and does not preserve fossils

SOCIO-ECONOMIC ENVIRONMENT

3.8 Provincial and Municipal Context

3.8.1 General

City of Tshwane is classified as a Category A municipality by the Municipal Demarcation Board in terms of section 4 of the Local Government Municipal Structures Act, 1998 (Act 117 of 1998). The Municipality was established on 5 December 2000 through the integration of various municipalities and councils that had previously served the greater Pretoria regime and surrounding areas. The boundary of the city was further amended on 28 May 2008 through a proclamation in the Government Gazette which incorporated the former Metsweding District Municipality, including Nokeng tsa Taemane (Cullinan) and Kungwini (Bronkhorstspuit), into the borders of the city of Tshwane. The incorporation, which gave birth to the new City of Tshwane in May 2011 after the local government elections, was in line with the Gauteng Global City Region Strategy to reduce the number of municipalities in Gauteng by the year 2016.

With the incorporation of the above-mentioned areas, enlarged the area which covers to an extent of 6 345 km². The extent of this can be practically explained in that the City stretches almost 121 km from east to west and 108 km from north to south making it at that time the third-largest city in the world in terms of land area, after New York and Tokyo/Yokohama. It also makes up more than 30% of Gauteng which is 19 055 km² in extent.

Tshwane consists of 7 planning regions each with their own unique characteristics. The proposed pipeline will be situated in Region 3 of the municipality and in Ward 60. (Cot, 2019)

3.8.2 Demographics

With an estimated 3.31 million population, the City of Tshwane Metropolitan Municipality housed 5.8% and 24.1% of South Africa's and Gauteng's total population in 2017 respectively. Between 2007 and 2017, the population growth rate in the City of Tshwane averaged 2.92% per annum, which is close to double the growth rate of South Africa as a whole (1.56%). Gauteng's average annual growth rate came in just under at 2.57% over the same period.

Region 3 has a population of 656 000. This is approximately 18% of the total population of the City of Tshwane of 2 921 488 (Source: Statistics SA Census 2011).

in 2017, the City of Tshwane's population comprised of: 78.94% of the African population (2.61 million); 17.11% of the White population (566 000); 2.07% of the Coloured (68 500); and 1.88% of the Asian (62 100). Though the Asian population contributes the least in population shares in the City of Tshwane, it should be noted that it has recorded the highest average annual population growth rate over the 2007-2017 period. (CoT RIDF, 2014/5)

3.8.3 Regional Economy

The three sectors that contribute most to the national GDP is Community services (37%), Finances (29%) and Trade (11%). Region 3 contributes to 3% of the national GDP. (CoT RSDF, 2012)

3.8.4 Unemployment

In terms of income groups 45.7 % can be regarded as below the upper poverty line. 24.6% OF THE region is unemployed.

The region has fairly low education levels, with few people having a tertiary qualification. It is furthermore reported that only 7% of all adults have any schooling with a further 19% only being schooled up to Grade 12. This is most probably a significant factor in terms of the unemployment figures of the region and hence the issue of income. Approximately 26% of economically active persons were reported to be permanently unemployed in the 2011 national census. (CoT RIDF, 2014/5).

3.8.5 Health

Typical poverty related health issues persist with HIV Aids and Tuberculosis still being encountered at high percentages. The CoT has a number of programmes in place to address this situation. Target programmes include the following:

- ❖ An expanded programme on immunisation
- ❖ Women's healthcare
- ❖ Chronic services cancer, diabetes etc)
- ❖ Antenatal care and PMTCT (Prevention of Mother to Child Transfer)
- ❖ Tuberculosis and antiretroviral treatment
- ❖ Pharmaceutical services
- ❖ Mental health (clinics are rendering first level of care whereas second level of care is a specialised level of care and rendered in all community health centres (CHCs) and some selected clinics. All regions are covered.
- ❖ Dental services are a specialised service rendered by provincial staff in selected facilities. (CoT 2017 Annual Report)

Region 3 has 8 Clinics i.e., Gazankulu Clinic, Hercules Clinic, Lotus Garden Clinic, Phomoling Clinic, Saulsville Clinic, which provides these Primary Health Care services to the Community as well as the implementation of health programmes. (CoT RIDF, 2014/5)

3.8.6 Services

Region 3 has to operate and maintain the municipal water and sanitation infrastructure within the region, which includes – inter alia – a total length of approximately 1 830km of sewer pipe infrastructure and 2 130km of water pipe infrastructure. This function is rendered from two depots, namely the Water Distribution depot situated at 11 Johannes Ramokhoase Street, and the Wastewater Collection depot situated at 13 Johannes Ramokhoase Street.

Water Distribution involves Infrastructure Operations and Maintenance services on water networks excluding reservoirs, bulk pipelines pump stations and pressure control installations all of which are operated and maintained by the Bulk Water Section of the Water and Sanitation Division. Normal daily maintenance complaints are resolved on burst pipes, faulty water meters and other water- provision related complaints.

3.9 Land Use Character Of The Surrounding Area

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

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

NORTH						
	8	9	9	8, 9	4, 8	
WEST	8, 12	1, 4	1, 4, 8	1, 4, 8	1, 4, 13, 8	
	1, 25	1, 25		1, 20, 28	1, 20, 28	
	1, 25	1, 25	1	1	1	
	1, 25	1, 25	1, 25	1, 25	1	
SOUTH						
						EAST

NOTE: Each block represents an area of 250m X 250m,

Properties directly adjacent to the site to the north, east and west are also agricultural/rural areas and are basically similar in function and visual appearance. Further afield the area consists predominantly of undulating hills and mountainous areas.

3.10 Visual Environment

The construction phase of the new pipeline will cause an alteration to the character of the site in the form of the construction activities being visible on the Salvokop Ridge.

The Freedom Park Monument and heritage site is located on the apex of Salvokop but is only recognizable by the sequence of flagpoles on the skyline. The remaining heritage site features have been set in such a way that they are almost completely obscured and not visible from a distance.

A permanent geological feature in the form of the Salvokop outcrop, forms the focus of the area and the ultimate visual feature defining the skyline for surrounding residential areas. The only visual element dominating the skyline is the green vegetation that defines the general character of Salvokop.

Given these present visual attributes of the study area, the proposed pipeline will not have a significant visual impact on the existing Salvokop residents. This is based on the fact that the topography of the site will not be altered and neither the skyline. The removal of medium to large trees will have the most significant effect. For this reason, a site specific landscape rehabilitation plant has been developed to mitigate the anticipated visual in the short and long term. If this plan is implemented, it is believed that the proposed development will have no discernible visual impact during the operational phase.

3.11 Noise

As the activities and facilities will undergo the construction phase, there will be some construction related noise impacts. Local communities and surrounding landowners will not be able to differentiate between this and the existing construction related noise impacts and for this reason the additional impact in terms of the construction phase noise of the proposed pipeline should be negligible. No operational noises will occur.

3.12 Traffic

The anticipated traffic volumes and types of traffic which is expected as a result of proposed bulk water supply are deemed to be in keeping with the land use and will mostly be concentrated on the construction area. As in the case above, additional construction related traffic will not be recognisable by the local communities and surrounding landowners. Mitigation in terms of keeping to the agreed access routes, maintenance of the construction vehicles and traffic safety has to be strictly adhered to as per the EMPr mitigation measures.

4. THE PUBLIC PARTICIPATION PROCESS

4.1 Introduction

The objective of the public involvement process is to provide interested and affected parties (I&AP's) e.g., all local and provincial authorities, adjacent landowners, community leaders, service providers and other stakeholders, with the opportunity to identify issues and concerns regarding the proposed project. The participation process also assists in the identification of ways in which concerns can be addressed and alternatives considered. The DFFE was consulted prior to the start of the public participation process in order to establish their requirements in this regard. The prescribed process entailed inter alia the process as set forth in Chapter 6 of the EIA Regulations R543 of the NEMA (Act No. 107 of 1998).

The basic elements of the public participation process consist of the advertisement of the project in the press, as well as on site whereby the intent of the proposed project is described. These advertisements also disclose the environmental assessment practitioners' contact details to enable I&APs to register and to express any interest or concern which they may harbour. I&APs are also invited to a public meeting (to be held should the proposed project evoke sufficient interest). A Background Information Document (BID) is drafted and distributed to all of the I&APs via registered mail, e-mail, or other communication method. This document again explains the intent of the applicant as well as what the full extent of the project will include. Contact details are again provided in order to assist I&APs in forwarding their comments. Any and all of the positive and negative comments are thereby obtained and dealt with on a case-by-case basis.

4.2 Identification of Interested and Affected Parties

Advertisements regarding the activities and facilities was placed on the site boundary (See Appendix 5_1) as well as being published in the Daily Sun Newspaper on the 2nd of September 2022. (See Appendix 5_2).

All of the implicated Local, Provincial and National Government Departments and their relevant sub sections were contacted, and their contact details obtained. Other non-government organizations and institutions as well as the local and provincial service providers in the area were informed in the same manner (See Appendix 5_4). The BID regarding the project was drafted and distributed via e-mail to all of the abovementioned parties. The BID was also distributed to all the surrounding landowners. Some of the surrounding landowners were contacted by telephone and the project discussed. This was followed up by providing them with the BID document. (See Appendix 5_3).

4.3 Summary of Comments Received During Phase 1

Immediate Neighbours, Adjacent Landowners and Landowners

In short, the following aspects were noted by the adjacent landowners:

- ❖ **Freedom Park**

The General Manager of the Freedom Park Infrastructure Section requested additional detail on the alignment of the proposed pipeline and the connection point to the existing bulk pipeline in the pipeline servitude.

Ward Councillors

- ❖ No comments were received to date.

Government Departments

- ❖ The Gauteng Department Agriculture and Rural Development (GDARD) and the Gauteng

Provincial Department of Roads and Transport (GPDRT) registered and Interested and Affected Parties. The Draft BAR will be forwarded to them for comment in due course.

Local Authorities

- ❖ No comments were received from any Municipal Department to date.

NGOs, CBOs, Conservancies, Residential Associations, Service Providers

- ❖ Rand Water Responded and requested that they be provided with the GIS Shapefiles and the Application for the proposed pipeline in order for them to determine if their services would be affected.

- ❖ Sasol Gas

Sasol Gas responded and indicated that their services are not affected.

- ❖ Transnet

Transnet Pipelines responded and indicated that their services are not affected.

The EAP responded to each of the aspects raised above and the responses are summarised in the paragraph below.

4.4 Summary of Responses During Phase 1

The summary below provides an overview of the responses made by the EAP on the principal comments raised by the stakeholders. Feedback in this section represents that included up to the submission of the Draft BA.

Immediate Neighbours, Adjacent Landowners and Landowners

- ❖ Freedom Park

A short telecom was held between SPOOR and the Freedom Park Facilities and Infrastructure Section, and the project discussed. The relevant background information was sent through as well as an Engineering drawing to shed light on the specific alignment and the connection points.

Government Departments

- ❖ GDARD & The GPDRT

The notices of the GDARD and the GPDRT were acknowledged. The Draft BARs will be forwarded to them for comment in due course.

Other NGOs, CBOs, Conservancies, Residential Associations, Service Providers

- ❖ Rand Water

The requested information was sent. Rand water subsequently responded in that their services are not affected.

4.5 Conclusion

The overarching aim of the PPP is not only to adhere to the required legislation, but also to give as many stakeholders as possible an opportunity to be actively involved in this process. SPOOR Environmental Services (Pty) Ltd. identified and contacted the relevant I&APs as far as possible to inform them of the proposed development and relevant procedures as well as to provide opportunity to raise issues and

concerns about the proposed hydrogen development.

SPOOR believes that I&APs were given sufficient opportunity to participate in the environmental process to date. I&APs that registered because of the advertisements and subsequent notices were logged and provided with additional information where this was requested. All of these responses (to and from the EAP) were included in the assessment to guide the studies to reach the most productive solutions for the Salvokop bulk water supply pipeline. Where I&AP's could not be contacted during the initial stages of the public involvement process, the EAP continues attempts to reach these parties to be able to involve them in the process.

5. DESCRIPTION OF ALTERNATIVES

The concept of the weighing of different alternatives in a proposed development is defined in the Department of Environmental Affairs and Tourism's (DEAT) 2004 Integrated Environmental Management (IEM) Information Series as:

"a possible course of action, in place of another, that would meet the same purpose and need".

Additionally, the role of alternatives is explained to be:

"to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts." (DEAT, 2004).

The following alternatives will be considered for the development of the Salvokop Bulk Water Supply Pipeline.

5.1 Environmental Authorisation Application – for the Construction of a Proposed Bulk Water Supply Pipeline Salvokop, City of Tshwane Metropolitan Municipality

This alternative is the preferred property, layout, design, and activity alternative. As per the abovementioned motivations, the proposed bulk water supply pipeline will comprise of a continuous welded steel pipeline of 850mm diameter, spanning 365m of which approximately 250m was outside of the existing servitude. The servitude would be on the order of 10m wide on the Remainder of Portion 406 of the Farm Pretoria Town and Townlands 351-JR.

A registered servitude exists for the proposed pipeline, but the existing pipeline cannot be decommissioned while the new pipeline is installed. In addition, there is also tourism infrastructure on top of the existing servitude which necessitated an alternative route. Approximately 280m (x 10-15m wide) of the pipeline will need to be constructed on a new alignment.

The current 700 mm diameter steel pipe from the Salvokop reservoir is approaching the end of its design life and an agreement has been reached between the City of Tshwane Metropolitan Municipality and the Department of Public Works that the existing 700 mm dia pipeline will be decommissioned and replaced by a new 850 mm diameter steel pipeline, which will be sufficient to supply the entire Salvokop reservoir supply zone, i.e. the existing zone and the proposed Salvokop Government Precinct development. The proposed infrastructure includes:

- ❖ ± 365m bulk water pipeline of which ±250m falls outside of the existing servitude;
- ❖ Pipeline made of 8mm thick continuous welded steel pipe;
- ❖ Pipeline buried a minimum of 2m deep and placed on a 150mm sand bedding layer;
- ❖ Minimum cover of 1m over pipeline;
- ❖ ± 2m wide excavation in a 10m servitude;
- ❖ Associated pipeline infrastructure.

Construction Phase Activities:

- ❖ Site Camp establishment including site offices, materials, and equipment storerooms, material laydown areas, construction vehicle parking, sanitary facilities, and the fencing off, of the construction camp etc.;
- ❖ Site preparations for the start of construction including setting out of the construction areas by the land surveyor; traffic abatement and other statutory arrangements etc.

Construction Phase Facilities:

- ❖ Security fence around the construction camp;
- ❖ Site offices;
- ❖ Construction materials storerooms and laydown areas;
- ❖ Construction vehicle parking;
- ❖ Chemical Toilets;
- ❖ Waste collection area.

Operational Phase:

- ❖ See Project Overview

5.2 The “NO-GO” Alternative

This alternative involves maintaining the status quo by not developing this bulk water supply pipeline. This alternative is not considered to be viable at this stage. With the growing population worldwide the associated demand for basic services like water, increases yearly. The existing pipeline has reached its end of life but can't be decommissioned until a new pipeline has been installed to be used as replacement. If the new pipeline is not installed, water supply the entire Salvokop reservoir supply zone, i.e., the existing zone and the proposed Salvokop Government Precinct development will not be able to continue. Without the water supply, the historic features, sports facilities and residents and businesses will not be able to continue to contribute to the GDP of South Africa. Tourism and the associated income will decrease as facilities at the Freedom Park monument and stadium will not be able to continue. Additionally, the site where the pipeline will be installed is situated on disturbed and highly invaded areas, thus the majority of the project area no longer represents CBA area nor intact savannah habitat. The development can therefore be supported if due consideration is made of all the recommendations prescribed in section 7 as well as the mitigation measures laid down in the EMPr (Appendix 6) for the proposed development.

5.3 Key reasons why no other alternatives were considered:

- ❖ The proposed bulk water supply pipeline is required in terms of the masterplan.
- ❖ To avoid having to disturbed already developed areas as part of the Freedom Park development, the pipeline servitude will be realigned.
- ❖ The surrounding land uses adjacent to the site are all vacant or light to medium residential uses,
- ❖ The facility is located on the area that was previously disturbed and are heavily invaded by alien species,
- ❖ the operations currently will secure and provide temporary and permanent employment opportunities,
- ❖ With the growing economic pressures on the basic services sector, the area, services, and tourist attractions will not be able to operate in a financially viable manner without the bulk water supply pipeline,
- ❖ Minimal natural or indigenous vegetation will have to be removed for the development to proceed.
- ❖ No heritage or paleontological features will be affected.

6. DESCRIPTION OF ENVIRONMENTAL ISSUES IDENTIFIED

6.1 Introduction

Environmental Issues Identified in the impact assessment section of the report were identified in accordance with the guidelines as set forth by Section 21(1) of the Environment Conservation Act, (Act No. 73 of 1989), as well as the regulations described in the DEAT IEM Information Series (DEAT, 2004).

6.2 Key Environmental Issues

The National Web based Environmental Screening Tool was used to generate a Screening Tool Report. The report is included in Appendix 3. The Screening Tool identifies related exclusions and/ or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site.

The Screening Tool allows for the generating of a Screening Report referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended whereby a Screening Report is required to accompany any application for Environmental Authorisation and as such the tool has been developed in a manner that is user friendly and no specific software or specialised GIS skills are required to operate this system. The gazetted protocols in **Table 4** are applicable to the proposed development according to the screening report.

Anticipated environmental issues were further determined by superimposing the various elements of the proposed activity over the existing environment. This information was screened and used to inform the specialist studies where relevant. Detailed information from the specialists was used to develop a site sensitivity analysis. Further planning and design decisions and recommendations were made based on this site sensitivity analysis. Impacts will be discussed in terms of the criteria mentioned in the following section.

Table 4: Summary of Screening Tool Report Findings and Reasons of Inclusion or Exclusion of Specialist Assessment

No.	Specialist Assessment	Screening Report Sensitivity Rating	Inclusion or Exclusion	Reasons
1	Agricultural Theme & Agricultural Impact Assessment	Medium	Exclusion	The property is zoned for S.A.R. and may be used for Railway purposes. The proposed project will not influence the agricultural potential. As such, a Compliance Statement will not be conducted.
2	Landscape/ Visual Impact Assessment	No rating	Exclusion	The proposed development is for a bulk water supply pipeline, which will have a very low impact on the visual landscape as the construction will be temporary and no above-ground infrastructure will be visible. As such, no visual or landscape assessment will be included in the BAR.
3	Archaeological and Cultural Heritage Theme &	Very High	Inclusion	Phase I Cultural Heritage Impact Assessment has been completed and will be submitted to the South African Heritage Resources Agency (SAHRA) by means of the online SAHRIS System.

No.	Specialist Assessment	Screening Report Sensitivity Rating	Inclusion or Exclusion	Reasons
	Impact Assessment			which will indicate whether any specialist assessments are required.
4	Palaeontology Theme & Impact Assessment	Very High	Inclusion	Phase I Cultural Palaeontological Impact Assessment has been completed and will be submitted to the South African Heritage Resources Agency (SAHRA)) by means of the online SAHRIS System. which will indicate whether any specialist assessments are required.
5	Terrestrial Biodiversity Theme & Impact Assessment	Very High	Inclusion	The EAP does not concur with the finding of the screening report that the area is very highly sensitive for biodiversity, since most of affected area has been disturbed by previous development activities, for this reason the EAP regards the area to have a medium sensitivity. A Terrestrial Biodiversity Compliance Statement was conducted.
6	Plant Species Theme	Medium	Inclusion	The EAP agrees with the medium sensitivity for plant species. A Terrestrial Plant Species Compliance Statement was conducted.
7	Animal Species Theme	Medium	Inclusion	The species mentioned in the screening report were not observed during the visual inspection and due to the property already being disturbed by construction activities it is expected that these species would have migrated to adjacent, less disturbed areas. The EAP does not concur with the rating and is of the opinion that the site is of low sensitivity. A Terrestrial Biodiversity Compliance Statement was conducted.
8	Aquatic Biodiversity Theme & Impact Assessment	Low	Exclusion	There are no surface water resources within 100m of the development area. The EAP concurs with the findings of the screening report and is of the opinion that the rating should be low. No aquatic biodiversity compliance statement will be done for the BAR.
9	Civil Aviation Theme	Medium	Exclusion	The EAP does not concur with the finding of the screening report and is of the opinion that the sensitivity is low to insignificant. As such, no further studies will be conducted.
10	Defence Theme	Very High	Exclusion	The development will not impact on defence installation. As such, no further assessment is required.

6.3 Impact Significance Criteria and Rating Scales

In accordance with the requirements of the NEMA, 1998 (Act 107 of 1998) the potential and anticipated impacts will be assessed in terms of the criteria and rating scales listed below. Table 3 provides a summary of the impact criteria and rating scales used to determine the significance of potential impacts.

Table 5: Impact Criteria and Rating Scales

Criteria	Rating Scales	Notes
Nature	❖ Positive	This is an evaluation of the type of effect the construction, operation and management of the proposed development would have on the affected environment.
	❖ Negative	
	❖ Neutral	
Extent	❖ Low	Site-specific, affects only the development footprint.
	❖ Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius).
	❖ High	Regional (beyond a 10 km radius) to national.
Duration	❖ Low	0-4 years (i.e., duration of construction phase).
	❖ Medium	5-10 years.
	❖ High	More than 10 years to permanent.
Intensity	❖ Low	Where the impact affects the environment in such a way that natural, cultural, and social functions and processes are minimally affected.
	❖ Medium	Where the affected environment is altered but natural, cultural, and social functions and processes continue albeit in a modified way; and valued, important, sensitive, or vulnerable systems or communities are negatively affected.
	❖ High	Where natural, cultural, or social functions and processes are altered to the extent that the impact will temporarily or permanently cease these functions and processes; and valued, important, sensitive, or vulnerable systems or communities are substantially affected.
Frequency of Occurrence	❖ Continuous	Where Impact will occur without interruption
	❖ Intermittent	Impact occurring from time to time without any periodicity
	❖ Periodic	Impact occurring at more or less regular intervals
	❖ Time-linked	Impact occurring only or mostly at specific times e.g., at night or during office hours

Criteria	Rating Scales	Notes
Probability (the likelihood of the impact occurring)	❖ Low	It is highly unlikely or less than 50 % likely that an impact will occur.
	❖ Medium	It is between 50 and 70 % certain that the impact will occur.
	❖ High	It is more than 75 % certain that the impact will occur, or it is definite that the impact will occur.
Reversibility	❖ Low	Low ability of environment to be reverted to pre-impact state if cause of impact is removed
	❖ Medium	Medium ability of environment to be reverted to pre-impact state if cause of impact is removed
	❖ High	High ability of environment to be reverted to pre-impact state if cause of impact is removed
Potential for impact on irreplaceable resources	❖ Low	No irreplaceable resources will be impacted.
	❖ Medium	Resources that will be impacted can be replaced, with effort.
	❖ High	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence (A combination of extent, duration, intensity, and the potential for impact on irreplaceable resources).	❖ Low	A combination of any of the following: - Intensity, duration, extent, and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium and all three other criteria are rated low.
	❖ Medium	Intensity is medium and at least two of the other criteria are rated medium.
	❖ High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all of the other criteria being rated medium or higher.
Significance (all impacts including potential cumulative impacts)	❖ Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.
	❖ Medium	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	❖ High	High consequence and medium probability. High consequence and high probability.

Criteria	Rating Scales	Notes
Confidence (Degree of confidence in the predictions, based on the availability of information and the specialist's knowledge and expertise)	❖ High	High degree of confidence in the predictions
	❖ Medium	Medium degree of confidence in the predictions
	❖ Low	Low degree of confidence in the predictions

An explanation of the above-mentioned impact criteria is provided below. Only the above-mentioned criteria will be taken into account during the assessment of impact significance. In addition, the degree of confidence in the prediction of impacts, the nature of applicable mitigation measures and legal requirements applicable to the impacts will also be described.

6.3.1 Nature

This is an evaluation of the type of effect the construction, operation and management of the proposed development would have on the affected environment. Will the impact change in the environment be positive, negative, or neutral? This description will include that which will be affected and the manner in which the effect will transpire. There may be a number of possible activities contributing to the same impact. Vice versa there may be a number of different impacts resulting from a single activity.

6.3.2 Extent or Scale

This refers to the spatial scale at which the impact will occur. Extent of the impact is described as: low (site-specific - affecting only the footprint of the development), medium (limited to the site and its immediate surroundings and closest towns) and high (regional and national). This refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of small extent, are of very high importance, e.g., impacts on species of very restricted range.

6.3.3 Duration

The lifespan of the impact is indicated as low (short-term: 0-4 years, typically impacts that are quickly reversible within the construction phase of the project), medium-term: (5-10 years, reversible over time) and high (long-term: greater than 10 years and continue for the operational life span of the proposed development).

6.3.4 Intensity or Severity

This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or

render it slightly altered? The EAP will quantify the magnitude of the impacts and outline the rationale used.

6.3.5 Impact on Irreplaceable Resources

This refers to the potential for an environmental resource to be replaced, should it be impacted. A resource could possibly be replaced by natural processes (e.g., by natural colonisation from surrounding areas), through artificial means (e.g., by re-seeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems substitutes are often possible (e.g., by constructing new social facilities for those that are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable e.g., red data species that are restricted to a particular site or habitat of very limited extent.

6.3.6 Consequence

The consequence of the potential impacts is a summation of above criteria, namely the extent, duration, intensity, and impact on irreplaceable resources.

6.3.7 Probability of Occurrence

The probability of the impact actually occurring based on professional experience of the EAP with environments of a similar nature to the site and/or with similar projects. Probability is described as low (improbable), medium (distinct possibility), and high (most likely). It is important to distinguish between probability of the impact occurring and probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.

6.3.8 Significance

Impact significance is defined to be a combination of the consequence (as described below) and probability of the impact occurring. The relationship between consequence and probability highlights that the risk (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact actually occurring. In simple terms, if the consequence and probability of an impact is high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.

6.3.9 Degree of Confidence in Predictions

The EAP will provide an indication of the degree of confidence (low, medium, or high) that there is in the predictions made for each impact, based on the available information and their level of knowledge and expertise. Degree of confidence is not taken into account in the determination of consequence or probability.

6.4 Environmental Aspects Identified

6.4.1 Climate, Geology and Soils

The following potential impacts have been identified with regards to geology and soils:

- ❖ Possible scouring and erosion
- ❖ Possible loss of topsoil
- ❖ Contaminations

Table 6: Impact Rating of Potential Geology & Soil Related Impacts

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Possible scouring and erosion	Phase: Construction										
Without Mitigation	Negative	Low	Low	Medium	Periodic	Medium	Medium	Low	Medium	Medium	High
With Mitigation	Negative	Low	Low	Low	Periodic	Low	High	Low	Low	Low	High
Possible loss of topsoil	Phase: Construction										
Without Mitigation	Negative	Low	High	Medium	Intermittent	High	Medium	Medium	Medium	Medium	High
With Mitigation	Neutral	Low	Low	Low	Intermittent	Low	High	Low	Low	Low	High
Surface and subsurface water contaminations	Phase: Construction										
Without Mitigation	Negative	Low	High	Medium	Intermittent	High	High	Medium	Medium	Medium	High
With Mitigation	Neutral	Low	Low	Low	Intermittent	Low	High	Low	Low	Low	High

Management and Mitigation Measures

1. Implement a construction/management plan to specify the most appropriate time (preferably May – early September) for any construction activities to commence and to phase the construction phase to clear only those areas influenced by the next phase of construction.
2. Special attention must be given to the overall storm water design to increase the volume of local storm water absorption, thereby decreasing the volumes and velocities of storm water at the discharge ends of the storm water system.
3. Construction and occupational phase storm water management must ensure community safety. Concentrated discharge must be avoided as far as possible and discharged safely.
4. Special attention must also be given to the design of the stormwater structures at the discharge ends of the overflow system so as not to cause erosion damage here.
5. Heavy downpours can create flash floods and the site area is specifically prone to these incidences during the summer months. The PC during construction and the management during the operational phase must create clearly visible on-site awareness to the risk of flash flooding.
6. Topsoil (top 300mm layer minimum) must be removed prior to any earthmoving activities and stockpiled separately from subsoil material and only at the sites of the construction camps and the footprint of the pipeline. The stockpiled topsoil mounds should not exceed 1,5m in height.
7. Topsoil should as far as possible not be stripped while wet.
8. Topsoil stripping should occur in a phased manner and only where construction will follow rapidly to avoid long periods of exposure and only during periods of low precipitation to avoid erosion and subsequent siltation of nearby water bodies.
9. Areas where construction must take place must be clearly demarcated to ensure that only these areas are stripped.
10. Topsoil must be stockpiled as close as possible to the area where it was stripped.
11. Stockpiled topsoil must not be compacted by any vehicle and should be protected against erosion. (E.g., construct a bunded area of sand around the topsoil stockpiles to ensure the containment of the topsoil).
12. Stockpiled topsoil must not be contaminated with oil, diesel, petrol, construction material or rubble or any other foreign matter, which may inhibit its potential to harbour faunal and floral communities after rehabilitation.
13. Stockpiled topsoil must not be used as fill material and should be replaced in the same order as it was stripped and in the same area where it was stripped for the pipeline excavation.
14. Compressibility and collapse potential of the soils and subsurface material of areas where the infrastructure is to be constructed should be investigated by a qualified engineer and construction should then commence according to the engineering Specialist's recommendations)
15. It is recommended that an engineering geologist or geotechnical engineer inspect all foundation areas and trenches prior to construction in order to identify and evaluate any surface or subsurface geological characteristics in variance with that found during the original geotechnical investigations. Any trench or cutting must also be declared safe to work in by the relevant Engineer and OHS Officer.
16. Erosion control measures should be implemented to prevent siltation and loss of existing and remaining topsoil on site.

17. In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product, such as Petro-Clean TM or similar. The absorbent and soil must be placed in a bin and removed from the site by a certified company and disposed of as a hazardous waste at a licensed commercial facility. No Hydrocarbons may escape into the environment. A spill recovery kit must be on site, along with trained personnel.
18. Vehicle tanks must not be over-filled. Overfill protection devices and shear-off valves must be installed in fuel dispensers and fuel dispensing hoses to prevent fuel spillages in the event of a drive-away during refuelling operations.
19. Staff must be trained to fill vehicles without spilling fuel.
20. A sufficient no. of Spill Kits must supply by a suitably accredited Supplier for the construction phase.
21. Any spill should be cleaned up immediately. Surface contaminations as a result of spillages outside of the dispensing apron area should also be cleared up immediately. Contaminated topsoil and surface water should be disposed of at designated hazardous waste handling facility or be managed by an appropriately qualified Contractor.

6.4.2 Hydrology

The following potential Stormwater Contamination related impacts have been identified:

- ❖ Surface water contaminations
- ❖ Erosion and siltation
- ❖ Water quality reduction
- ❖ Infrastructure failure due to erosion damage

Table 7: Impact Rating of Possible Storm Water Contamination Related Impacts

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Surface water contaminations	Phase: Construction										
Without Mitigation	Negative	Low	High	Low	Intermittent	High	High	Low	Medium	Medium	High
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High
Erosion and siltation	Phase: Construction & Operational										
Without Mitigation	Negative	Low	High	Medium	Intermittent	Medium	High	Medium	Medium	Medium	Medium
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High
Water quality reduction	Phase: Construction										

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Without Mitigation	Negative	Low	High	High	Intermittent	Medium	High	High	High	High	High
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High
Infrastructure failure due to erosion damage	Phase: Operation										
Without Mitigation	Negative	Low	High	High	Intermittent	Medium	High	High	High	High	High
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High

Management and Mitigation Measures

1. Topsoil (top 300mm layer minimum) must be removed prior to any earthmoving activities and stockpiled separately from subsoil material and only at the sites of the construction camps and the footprint of the pipeline. The stockpiled topsoil mounds should not exceed 1,5m in height.
2. Topsoil should as far as possible not be stripped while wet.
3. Topsoil stripping should occur in a phased manner and only where construction will follow rapidly to avoid long periods of exposure and only during periods of low precipitation to avoid erosion and subsequent siltation of nearby water bodies.
4. Areas where construction must take place must be clearly demarcated to ensure that only these areas are stripped.
5. Topsoil must be stockpiled as close as possible to the area where it was stripped.
6. Stockpiled topsoil must not be compacted by any vehicle and should be protected against erosion. (E.g., construct a bunded area of sand around the topsoil stockpiles to ensure the containment of the topsoil).
7. Stockpiled topsoil must not be contaminated with oil, diesel, petrol, construction material or rubble or any other foreign matter, which may inhibit its potential to harbour faunal and floral communities after rehabilitation.
8. Stockpiled topsoil must not be used as fill material and should be replaced in the same order as it was stripped and in the same area where it was stripped for the pipeline excavation.

9. Compressibility and collapse potential of the soils and subsurface material of areas where the infrastructure is to be constructed should be investigated by a qualified engineer and construction should then commence according to the engineering Specialist's recommendations)
10. It is recommended that an engineering geologist or geotechnical engineer inspect all foundation areas and trenches prior to construction in order to identify and evaluate any surface or subsurface geological characteristics in variance with that found during the original geotechnical investigations. Any trench or cutting must also be declared safe to work in by the relevant Engineer and OHS Officer.
11. Erosion control measures should be implemented to prevent siltation and loss of existing and remaining topsoil on site.
12. Concurrent monitoring must be done on the rehabilitated area to ensure that no sagging is taking place. Any sagging must be rehabilitated when discovered as well as the formation of erosion gullies and any other form of infrastructure failure that might cause erosion and siltation.
13. In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product, such as Petro-Clean TM or similar. The absorbent and soil must be placed in a bin and removed from the site by a certified company and disposed of as a hazardous waste at a licensed commercial facility. No Hydrocarbons may escape into the environment. A spill recovery kit must be on site, along with trained personnel.
14. Vehicle tanks must not be over-filled. Overfill protection devices and shear-off valves must be installed in fuel dispensers and fuel dispensing hoses to prevent fuel spillages in the event of a drive-away during refuelling operations.
15. Staff must be trained to fill vehicles without spilling fuel.
16. A sufficient no. of Spill Kits must supply by a suitably accredited Supplier for the construction phase.
17. Any spill should be cleaned up immediately. Surface contaminations as a result of spillages outside of the dispensing apron area should also be cleared up immediately. Contaminated topsoil and surface water should be disposed of at designated hazardous waste handling facility or be managed by an appropriately qualified Contractor.

6.4.3 Biodiversity Impacts

The following potential impacts related to visual aspects have been identified:

- Damage to existing indigenous vegetation
- Proliferation of alien vegetation

Table 8: Impact Rating Relating to Possible Terrestrial Biodiversity Impact

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
The further loss and fragmentation of vegetation communities within the CBA and ESA areas in the vicinity of the project area	Phase: Construction										
Without Mitigation	Negative	Low	High	Low	Intermittent	Medium	High	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High
The negative fragmentation effects of the development and enable safe movement of faunal species.	Phase: Construction										
Without Mitigation	Negative	Low	High	Low	Intermittent	Medium	High	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
The direct and indirect loss and disturbance of faunal species and community (including potentially occurring species of conservation concern).	Phase: Construction										
Without Mitigation	Negative	Low	High	Low	Intermittent	Medium	High	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Intermittent	Low	High	Low	Low	Low	High

Management and Mitigation Measures

1. Any individual protected plant that may be observed needs a relocation or destruction permit for any individual that may be removed or destroyed as a result of the activities. Preferably, the plants should be relocated to an area that will not be impacted on by future activities.
2. Activities should as far as possibly take place within the 'Very Low' sensitivity areas. Any activities that must take place within the medium areas must take special precautions against significantly disturbing indigenous flora and fauna species.
3. Any indigenous woody material that is removed during construction can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent erosion. Large, wooded stumps or branches may be used to enhance the local habitat features and encourage herpetofauna.
4. Areas of dense and healthy indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further. This is particularly relevant to the extensive rocky outcrops
5. Areas to be developed/disturbed must be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon.
6. All vehicles and personnel must make use of the existing roads and walking paths, especially construction/operational vehicles.
7. All laydown, chemical toilets etc. should be restricted to 'Very Low' sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded.
8. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds and to support the adjacent habitat. This will also reduce the likelihood of encroachment by more alien invasive plant species

9. All disturbed areas are to be rehabilitated and appropriately landscaped. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to the project area vegetation type. Progressive rehabilitation of cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank.
10. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.
11. Rocks removed during the construction phase may not be dumped but can be used in areas where erosion control needs to be performed. Alternatively, they may be piled to create useful habitat features for herpetofauna.
12. Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair.
13. A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment is to take place on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. It is important to appropriately contain any diesel storage tanks and/or machinery spills (e.g., accidental spills of hydrocarbons, oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.
14. A fire management plan needs to be compiled and implemented to restrict the impact that fire would have on remaining natural and newly rehabilitated areas. Natural areas remaining adjacent to the development footprint should be left to naturally regenerate, fire and cutting control methods are not to be used to clear areas containing natural indigenous vegetation.
15. Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks. This involves the installation of leak warning and detection systems, as well as the planting of dense indigenous pioneer grass seeds across all bare earth areas.
16. No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this. These actions are illegal in terms of provincial environmental legislation.
17. A qualified environmental control officer must be on site when clearing begins. The area must be walked through prior to construction to ensure that no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.
18. Any holes/deep excavations must be dug in a progressive manner in order to allow burrowing animals time to move off and to prevent trapping. Should the holes remain open overnight they must be covered temporarily to ensure no fauna species fall in.
19. Should any SCC fauna be observed nesting within the project area before or during construction, all activities must cease immediately. A relevant faunal specialist must be consulted in order to facilitate the capture or removal of any SCC animals.
20. The areas to be developed (or activity areas) must be specifically demarcated to prevent the movement of staff or equipment/vehicles into the surrounding environments. Signs must be put up to enforce this.
21. The duration of the construction should be minimized to as short a term as possible, to reduce the period of disturbance on fauna.

22. Outside lighting should be designed and limited to minimize impacts on fauna. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible.
23. All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. Speed bumps should be built to force slow speeds.
24. Noise must be kept to a minimum during the evenings/ at night to minimize all possible disturbances to amphibian species and nocturnal mammals.
25. Schedule activities and operations during the least sensitive periods, to avoid migration, nesting, and breeding seasons as far as possible.
26. Any significant heat generated from any source must be monitored to ensure that it does not negatively affect the local fauna.
27. Signs must be put up in order to show the importance and sensitivity of surrounding areas and their functions. This especially pertains to more natural ridge areas.
28. Only use environmentally friendly dust suppressant products.
29. The implementation of an Alien Invasive Plant management plan is very important, especially because of the invasive species identified on site which, if left unchecked, will continue to grow, and spread prolifically leading to further and more significant deterioration to the health of the natural environment within and nearby to the project area. The plan must especially pertain to any recently cleared and changed areas.
30. The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Road footprints must be kept to prescribed widths.
31. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site and proliferating.
32. A pest control plan must be put in place and implemented; it is imperative that poisons not be used.
33. All personnel are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on all sensitive environmental receptors within the project area to inform contractors and site staff of the presence of sensitive habitat features, such as ridges, and management requirements in line with the Environmental Authorisation and within the EMPr.
34. Contractors and employees must all undergo a strict environmental induction and be made aware of the sensitive habitats within and nearby to the project area.
35. All staff should receive an Environmental Awareness programme which also covers the surrounding area (ridges). This programme must be used to inform of the importance of these areas and their conservation.

6.4.4 Employment

The following potential impacts related to job creation has been identified:

- Additional local job opportunities

Table 9: Impact Rating Related to Job Creation

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
37 Permanent jobs created	Phase: Operation										
Without Mitigation	Positive	Low	High	High	Continuous	High	High	Low	High	High (Positive)	High
With Mitigation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Management and Mitigation Measures

1. Members of the local community should be employed as far as possible to increase the positive socio-economic effect in the local area.

6.4.5 Noise

The following potential noise related impacts have been identified:

- ❖ Increase of ambient environmental noise levels.
- ❖ Possible occupational noise levels.

Table 10: Impact Rating Related to Possible Noise Pollution

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Possible increase of environmental noise	Phase: Construction										
Without Mitigation	Negative	Low	High	Low	Periodic	Medium	Medium	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Periodic	Medium	Medium	Low	Low	Low	High
Possible occupational noise	Phase: Operation										
Without Mitigation	Negative	Low	High	Medium	Periodic	Medium	Medium	Medium	Medium	Medium	High
With Mitigation	Neutral	Low	High	Low	Periodic	Low	High	Low	Low	Low	High

Management and Mitigation Measures

1. The necessary personal protective equipment must be worn by construction staff and those working with noisy plant on a permanent basis.
2. The human resources manager must review Regulation 4 of the Noise-Induced Hearing Loss Regulations of the Occupational Health and Safety Act (Act no. 85 of 1993) and implement the necessary protective measures where relevant.
3. Perform regular maintenance, such as lubrication of moving machine parts of the construction machines and motors to reduce noise and vibration levels.
4. A complaints register can be kept on site where adjacent landowners can lodge complaints if required.

6.4.6 Air Quality

The following potential air quality related impacts have been identified:

- ❖ Potential health impacts on workers and locally sensitive receptors due to dust created by construction.

Table 11: Impact Rating Related to Air Quality

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Potential Impacts on sensitive receptors, surrounding residents and staff.	Phase: Construction										
Without Mitigation	Negative	Low	High	Low	Continuous	Medium	Medium	Low	Low	Low	Medium
With Mitigation	Negative	Low	High	Low	Continuous	Low	High	Low	Low	Low	Medium

Management and Mitigation Measures

1. Dust-reducing mitigation measures must be put in place and be strictly adhered to, particularly for all dirt roads and any earth dumps. This includes the wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated. Only environmentally friendly suppressants may be used to avoid the pollution of water sources. Speed limits must be put in place to reduce erosion, and speed bumps should also be constructed.
2. Develop and implement a dust monitoring programme for the area.
3. The measures below are general good practice but will become essential in the event of dust complaints:
 - a) Dust control measures include but are not limited to covering of dry materials, rehabilitation of exposed areas, reducing drop heights of dry materials such as feed and dried manure etc., maintaining road surfaces.
 - b) Servicing of vehicles and plant on a regular basis will ensure that the minimum levels of exhaust gasses are released during operations.

6.4.7 Traffic Safety

The following potential traffic safety impacts have been identified:

- ❖ Possible impacts include unsafe traffic conditions during the arrival and departure of large vehicles.

Table 12: Impact Rating of Possible Traffic Related Impacts

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Movement of large vehicles on and off the Construction site	Phase: Construction										
Without Mitigation	Negative	Low - high	High	Medium	Periodic	High	High	High	High	High	High
With Mitigation	Neutral	Low - high	High	Low	Periodic	Low	High	Low	Low	Low	High

Management and Mitigation Measures

1. Drivers of vehicles must hold the relevant licencing and permits for the class of vehicle that they drive.
2. The contractor or delegated staff member must perform periodic assessments of the road infrastructure at the entrance to the facility and repair any damage caused by construction activities.
3. Due to the locality of the construction site, it is recommended that warning signs be erected notifying road users of slow-moving heavy vehicles entering and exiting the construction site at this point.

6.4.8 Fire

The following potential impacts related to the incidence of fire have been identified:

- ❖ Potential fire hazard.

Table 13: Impact Rating Related to Possible Fire Hazard

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Potential fire hazard	Phase: Construction										
Without Mitigation	Negative	Low	High	High	N/A	Medium	High	High	High	High	High
With Mitigation	Neutral	Low	High	Low	N/A	Low	High	Low	Low	Low	High

Management and Mitigation Measures

1. Designated smoking areas must be created.
2. All activities and facilities where flammable fuels, liquids and other solvents are stored must be equipped with appropriate fire distinguishing equipment which must be monitored and serviced by a qualified service operator on the recommended schedule.
3. Training must be provided on the site fire hazards and an appropriate procedure developed to manage the potential incidence of a fire at the farm.

6.4.9 Heritage Features Impacts

The following potential impacts related to visual aspects have been identified:

- ❖ Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- ❖ Indirect impacts, e.g., restriction of access or visual intrusion concerning the broader environment;
- ❖ Cumulative impacts that are combinations of the above.

Table 14: Impact Rating Relating to Possible Heritage Features Impact

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Alteration or destruction of heritage features	Phase: Construction										
Without Mitigation	Neutral	Low	High	Low	Periodic	Low	Not applicable	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Periodic	Low	Not applicable	Low	Low	Low	High

Management and Mitigation Measures

1. For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed.

6.4.10 Paleontological Features Impacts

The following potential impacts related to palaeontological resources have been identified:

- ❖ Direct or physical impacts, implying alteration or destruction of palaeontological resources within the project boundaries;

Table 15: Impact Rating Relating to Possible Heritage Features Impact

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Alteration or destruction of heritage features	Phase: Construction										
Without Mitigation	Neutral	Low	High	Low	Periodic	Low	Not applicable	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Periodic	Low	Not applicable	Low	Low	Low	High

Management and Mitigation Measures

1. Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the quartzites of the Timeball Hill Formation (Pretoria Group, Transvaal Supergroup) or in the sands and soils of the Quaternary. There is a very small chance that trace fossils may occur in the quartzites and shale lenses of the Timeball Hill Formation so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the environmental officer or other responsible person once excavations have commenced, then they should be rescued, and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be low, therefore as far as the palaeontology is concerned, the project should be authorised.

6.4.11 Visual Impacts

The following potential impacts related to visual aspects have been identified:

- ❖ Construction related activities.
- ❖ Final visual outlook of the development.

Table 16: Impact Rating Relating to Possible Heritage Features Impact

Activity/Impact	Nature	Extent	Duration	Intensity	Frequency	Probability	Reversibility	Potential for Impact on Irreplaceable Resources	Consequence	Significance	Confidence
Construction related activities & final visual outlook of the development	Phase: Construction & Operation										
Without Mitigation	Neutral	Low	High	Low	Periodic	Low	Not applicable	Low	Low	Low	High
With Mitigation	Neutral	Low	High	Low	Periodic	Low	Not applicable	Low	Low	Low	High

Management and Mitigation Measures

1. Negative impacts related to the construction phase of the development will only last for the duration of the construction phase of the development and will thus not be permanent. The PC and subcontractors must see to the overall tidiness of the construction area and that construction vehicles, materials and personnel stay within the construction camps after hours, over weekends and on public holidays. For the relevant proposed fines see APPENDIX 1.
2. Indigenous vegetation must be used to screen negative visual aspects of structures. Screening must however not be obtrusive to the natural character of the site.
3. The landscape rehabilitation plan included in the EMPr must be implemented.
4. Existing vegetation should be retained as far as possible at the construction site and the temporary construction camp structures to act as visual screens/absorbers and dust collectors.
5. No painting or marking of natural features shall be allowed. Marking for surveying and other purposes shall only be with pegs and beacons.
6. Additional locally indigenous landscaping should also be implemented in key areas to screen negative visual aspects.

7. Topographic shaping should be implemented - final profile of rehabilitated areas is formed to emulate natural contours of the area. Cuttings and fill areas to be rehabilitated to emulate occurrence of natural rocky outcrops in the area both in colour and shape.
8. Rehabilitate/restore exposed areas as soon as possible after construction activities are complete.
9. Dust suppression techniques should be in place at all times during the construction phase.
10. No construction rubble, construction material, refuse, litter, or any other material not found naturally in the surroundings should be allowed at any time to be lying around on the construction site.

6.5 Impact Summary

The following table serves as a summary of the identified impacts associated with the proposed bulk water supply pipeline. The significance of the impacts discussed in Table 15 is of that without any mitigation measures added. To view the significance of the possible impacts with mitigation added see Section 6.4.1 – 6.4.11.

Table 17: Impact Summary

Potential Impacts	Impact Significance with Mitigation
Climate, Geology and Soils:	
❖ Possible scouring and erosion	Low
❖ Possible loss of topsoil	Low
❖ Contaminations	Low
Hydrology:	
❖ Surface water contaminations	Low
❖ Erosion and siltation	Low
❖ Water quality reduction	Low
❖ Infrastructure failure due to erosion damage	Low
Fauna and Flora	
❖ Damage to existing indigenous vegetation	Low
❖ Proliferation of alien vegetation	Low
Local Employment:	
❖ Additional local job opportunities	High (positive)
Visual Impacts:	
❖ Negative visual impact related to vegetation removal	Low
Noise	
❖ Increase of ambient environmental noise levels.	Low
❖ Possible occupational noise levels	Low
Air Quality	
❖ Potential health impacts on workers and locally sensitive receptors due to dust created by construction.	Low
Traffic Safety	
❖ Possible impacts include unsafe traffic conditions during the arrival and departure of large vehicles.	Low
Fire	
❖ Potential fire hazard	Low
Heritage Features	
❖ Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;	Low
❖ Indirect impacts, e.g., restriction of access or visual intrusion concerning the broader environment;	
❖ Cumulative impacts that are combinations of the above.	
Paleontological Features	
❖ Direct or physical impacts, implying alteration or destruction of palaeontological resources within the project boundaries	Low
Visual	
❖ Construction related activities.	Low
❖ Final visual outlook of the development.	Low

7. CUMULATIVE AND REGIONAL IMPACTS

A cumulative impact may result from changes to the environment caused by an action/impact in combination with other past, present, and future actions or impacts. Cumulative impacts can arise from one or more activities. The assessment of cumulative impacts on a study area is difficult; as many of the impacts occur on a much wider scale than the site being assessed and evaluated. It is often difficult to determine at which point the accumulation of many small impacts reaches the point of an undesired or unintended cumulative impact that should be avoided or mitigated. There are often factors which are uncertain when potential cumulative impacts are identified.

Habitat Loss:

The site is situated in the *Gauteng Shale Mountain Bushveld* Vegetation type which is listed least concern, meaning ecosystem type has experienced little or no loss of natural habitat or deterioration in condition. The Specialist ecological Biodiversity Compliance Statement reported that the area no longer represents CBA area nor intact savannah habitat. This is largely due to the fact that most of the area has experienced long-term and continuous disturbance, mostly in the form of IAP invasion and vegetation clearing as a result of the edge effects of nearby construction and other disturbance activities. The project area does however contain unique habitat features such as extensive rocky outcrops, in addition to dense sections of mature indigenous trees and shrubs. Thus, the natural portions of the project area may be regarded as ESA. The site is furthermore partly situated within the CoT's urban edge, which renders this site better for development purposes than a site with vegetation in a better condition and outside of the urban edge.

Stormwater Run-off:

The pipeline development may cause erosion of the local topsoils as well as associated siltation of the downstream waterbodies in the area if not managed appropriately. Furthermore, erosion may lead to damage to the installed pipeline infrastructure causing it to fail. Detailed mitigation and site rehabilitation measures have been developed to curb these impacts and it is believed that the prescribed measures will all but remove any noteworthy, related impacts when implemented.

Employment Opportunities:

The development and operation of the proposed infrastructure with its associated services will result in job opportunities being created. Mitigation measures have been developed to have these opportunities accrue to the local communities first. In the light of the local socio-economic profile, every additional employment opportunity will make a significant contribution towards the reduction of unemployment in the area and in Tshwane.

8. CONCLUSION

It is believed that the most noteworthy, anticipated impacts and other relevant issues have been identified at the conclusion of this, the draft BAR phase of the proposed Bulk Water Supply Pipeline, Salvokop. The receiving environment of the proposed development have been scrutinized in terms of the most pertinent impacts revealed by specialist studies, maps, and other literature as well as discussions with representatives of local authorities and interested and affected parties.

Possible negative impacts which may occur during the construction and operational phase were identified and their significance rated accordingly. Pertinent impacts identified include:

- ❖ Impacts as a result of inclement weather conditions,
- ❖ Surface and subsurface soil contaminations,
- ❖ Surface and groundwater contaminations,
- ❖ Limited disturbances to faunal species,
- ❖ Occupational noise levels,
- ❖ Limited reduction in air quality,
- ❖ Possible traffic safety issues,
- ❖ Potential fire related impacts,
- ❖ Heritage features, and
- ❖ Paleontological resources.
- ❖ Visual impacts due to the removal of vegetation.
- ❖ On a positive note, the socio-economic benefits created by local employment and the associated benefits to the local economy.

A thorough Public Participation Process was also conducted to date. Responses received from local I&APs and other stakeholders, as well as the proofs of newspaper and onsite adverts have been included in this report. The issues and response report serves as a summary of the comments and responses received from I&APs to date and is also be included in this report. The EAP addressed comments on a case-by-case basis.

8.1 Environmental Management Programme (EMPr)

In accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs and Tourism in 2004, Guideline document 12, the purpose of the EMPr is to

“describe how negative environmental impacts will be managed, rehabilitated and monitored and how positive impacts will be maximized”

It is a detailed plan of action prepared to organise and coordinate environmental mitigation, rehabilitation, and monitoring. A Draft EMPr will be submitted with the BAR and when authorized must be adopted in conjunction with the mitigation measures and recommendations as included in the BAR. As such the EMPr must be viewed as a dynamic document that may require updating and revision where necessary.

9. ENVIRONMENTAL IMPACT STATEMENT

In terms of the information evaluated the EAP is of the opinion that the impacts identified can be successfully mitigated to acceptable levels. The bulk water supply pipeline can also make a substantial positive socio-economic impact especially on the local level but also on a regional and national scale, and it is therefore recommended that the proposed development be approved.

It will be imperative to implement the mitigation measures and recommendations stipulated by this BAR and the various specialist studies. These mitigation measures and recommendations are included and refined in the project EMPr of which adherence must form part of the contractual agreement with any subcontractor or service provide appointed and especially with the feedlot and larger farming operational management. A copy of the draft EMPr is included in Appendix 6 and changes will be made to the document once feedback has been received from DFFE and the public consultation process have been completed.

10. REFERENCES

10.1 Published Resources

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10.2 Un Published Resources

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- ❖ City of Tshwane Metropolitan Municipality, 2005. Proposed Tshwane Open Space Framework.
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- ❖ The Biodiversity Company, 2022. The Terrestrial Biodiversity Compliance Statement for the proposed Freedom Park Bulk Water Pipeline Project

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