



**Lebalelo Water User Association
SE2 Pipeline and associated infrastructure
Draft Basic Assessment Report
DFFE Reference Number: 14/12/16/3/3/1/2442**

October 2021

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October 2021

Project Ref: 131-001

Prepared by: Suzanne van Rooy



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VERSION CONTROL

Alta van Dyk Environmental cc

Version: Draft

Approved by: Alta van Dyk

Signed:

A handwritten signature in black ink, appearing to read "Alta van Dyk".

Position: Environmental Specialist

Date: October 2021

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Abbreviations

AVDE	Alta van Dyk Environmental Consultants
BAR	Basic Assessment Report
BIL	Background Information Letter
CBA 1	Critical Biodiversity Area 1
CE	Centre of Endemism
CoG	Cooperative Governance
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and Environment
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EI&S	Ecological Importance and Sensitivity
EIA	Environmental Impact Assessment
EN	Endangered
ESA 1	Ecological Support Area 1
HGM	Hydrogeomorphic
HIA	Heritage Impact Assessment
IDP	Integrated Development Plan
LC	Least Concerned
LCP	Limpopo Conservation Plan
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LWUA	Lebalelo Water User Association
NBA	National Biodiversity Assessment
NEM:BA	National Environmental Management: Biodiversity Act
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NNR	No Natural Remaining
NWA	National Water Act
ORWRDP	Olifants River Water Resource Development Project
S&EIR	Scoping and Environmental Impact Reporting
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SE1	Southern Extension 1

SE2	Southern Extension 2
SPLUMA	Spatial Planning and Land Use Management Act
SWSA	Strategic Water Source Areas
TBC	The Biodiversity Company
VU	Vulnerable

1 INTRODUCTION AND BACKGROUND

1.1 Background

Lebalelo Water User Association (LWUA) is proposing a new raw water pipeline between the Spitskop Pump Station and Mototolo Mine, near Steelpoort in the Limpopo Province. This project is also referred to as the Southern Extension 2 (SE2) pipeline. There is an existing raw water pipeline running from LWUA's Havercroft Pump Station to Borwa Pump Station, referred to as Southern Extension 1 (SE1). The new pipeline (SE2) will be constructed within the current pipeline's (SE1) servitude. The purpose of the new pipeline (SE2) is to provide raw water to several mines and industries located along the pipeline route. The current pipeline's capacity is not sufficient for the growing water demand from LWUA's members.

The following is proposed for the new pipeline (SE2) project:

- New pump station at existing Spitskop Pump Station (within fenced area of existing Spitskop Pump Station);
- Solar panels (75 x 75m) to be constructed within fenced area of existing Spitskop Pump Station. This is for a 0,5MW solar panel generation plant;
- New 500mm pipeline 15 km in length from Spitskop Pump Station to Dwarsrivier Pump Station (within the current pipeline servitude);
- New concrete reservoir to be constructed near the Dwarsrivier Pump Station (10 Mℓ);
- New pump station adjacent to the current Dwarsrivier Pump Station; and
- New 300 or 350 mm pipeline 9 km in length from the new Dwarsrivier Pump Station to Mototolo Mine (within current pipeline servitude).

The proposed SE2 pipeline will provide raw water to the following entities:

- Lion Smelter (Glencore South Africa);
- Dwarsrivier Mine (Assore);
- Two Rivers Mine (African Rainbow Minerals);
- Mototolo Mine (Anglo American Platinum); and
- Steelpoort Industrial Park (Freedom Property Fund) (potentially).

Alta van Dyk Environmental Consultants cc (AVDE) has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the required environmental related applications and associated public participation process.

1.2 Purpose of the Report

The Draft Basic Assessment Report (BAR) has been compiled in support of the environmental authorisation process required before the proposed project may commence. The Draft BAR documents the steps undertaken during the basic assessment process to assess the significance of impacts and determine measures to mitigate the potential impacts identified and enhance the benefits (or positive impacts) of the proposed project. The report presents the findings of the impact assessment and a description of the public participation undertaken that forms part of the Basic Assessment process. More specifically, the objectives of this BAR are to:

- Inform the stakeholders about the proposed project and the basic assessment process followed;
- Obtain contributions from stakeholders (including the applicant, consultants, relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented and addressed;
- Assess in detail the potential environmental and socio-economic impacts of the project;
- Identify environmental and social mitigation measures to address the impacts assessed; and

- Produce a BAR that will assist the competent authority, the Department of Forestry, Fisheries and Environment (DFFE), to decide whether (and under what conditions) to authorise the proposed project.

1.3 Locality

The proposed project is located near Steelpoort in the Limpopo Province. Table 1:1 outlines the details relating to the location of the proposed project. Refer to Figure 1:1 for the regional locality map.

Table 1:1 Project location details

Site specific details	Description	
Municipal jurisdiction	Fetakgomo Tubatse Local Municipality Sekhukhune District Municipality	
Ward number	Ward 27	
Nearest town	The proposed pipeline starts approximately 5 km west from Steelpoort, Limpopo Province, from where it runs in a southerly direction to Mototolo Mine.	
Site coordinates	Latitude	Longitude
Starting point <i>(Spitskop Pump Station)</i>	-24° 48.5831S	30° 7.3836E
Middle point	-24° 54.7623S	30° 6.6146E
End point <i>(Mototolo Mine)</i>	-25° 0.5466S	30° 67565E

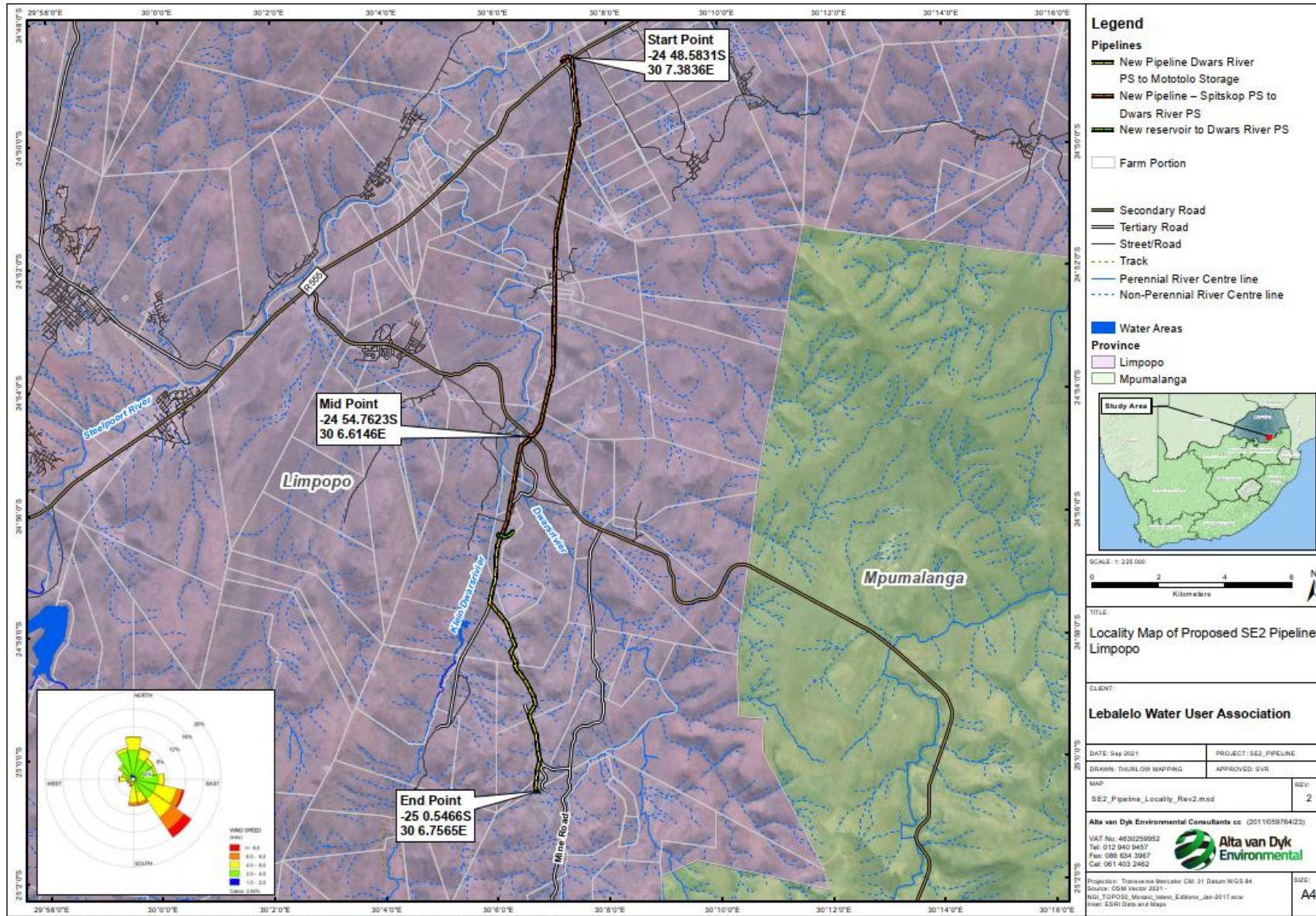


Figure 1:1 Locality map of the proposed SE2 pipeline project

A description of the properties on which the proposed project is located is provided in Table 1:2 and illustrated in Figure 1:2.

Table 1:2 Description of the properties

Property	Property portion	Registered landowner (Windeed)	SG21 number
Dwarsrivier 372 KT	Remaining Extent	Assmang Pty Limited	TOKT00000000037200000
Dwarsrivier 372 KT	Portion 1	Dwarsrivier Chrome Mine Pty Ltd	TOKT00000000037200001
Dwarsrivier 372 KT	Portion 6	Two Rivers Platinum (Pty) Ltd	TOKT00000000037200006
Dwarsrivier 372 KT	Portion 7	Glencore Operations South Africa Pty Ltd	TOKT00000000037200007
Helena 6 JT	Remaining extent	Rustenburg Platinum Mines Ltd	TOJT0000000000600000
Kennedy's Vale 361 KT	Portion 12	Karel Petrus Joubert	TOKT00000000036100012
Kennedy's Vale 361 KT	Portion 30	BCR Minerals Pty Ltd	TOKT00000000036100030
Spitskop 333 KT	Portion 20	Baobab Supplies Pty Ltd	TOKT00000000033300020
Thornccliffe 374 KT	Portion 1	Does not exist (as per Windeed)	TOKT00000000037400001
Thornccliffe 374 KT	Portion 3	Glencore Operations SA (Pty) Ltd	TOKT00000000037400003
Thornccliffe 374 KT	Portion 7	Glencore Operations SA (Pty) Ltd	TOKT00000000037400007
Twefontein 360 KT	Portion 1	Samancor Chrome Ltd	TOKT00000000036000001
Twefontein 360 KT	Portion 2	Jan Joubert Trust	TOKT00000000036000002
Twefontein 360 KT	Portion 3	Samancor Chrome Ltd	TOKT00000000036000003
Twefontein 360 KT	Portion 4	Samancor Chrome Ltd	TOKT00000000036000004
Twefontein 360 KT	Portion 6	Samancor Chrome Ltd	TOKT00000000036000006
Twefontein 360 KT	Portion 7	Rhodium Reefs Ltd	TOKT00000000036000007
Twefontein 360 KT	Portion 9	Samancor Chrome Ltd	TOKT00000000036000009
Twefontein 360 KT	Portion 10	Does not exist (as per Windeed)	TOKT00000000036000010
Steelpoort Ext 11	1216	Glencore Operations South Africa Pty Ltd	TOKT00100000121600000
Steelpoort Ext 11	1218	Glencore Operations South Africa Pty Ltd	TOKT00100000121800000
Steelpoort Ext 11	1221	Glencore Operations South Africa Pty Ltd	TOKT00100000122100000
Steelpoort Ext 10		Kadoma Inv Pty Ltd (Industrial Park)	

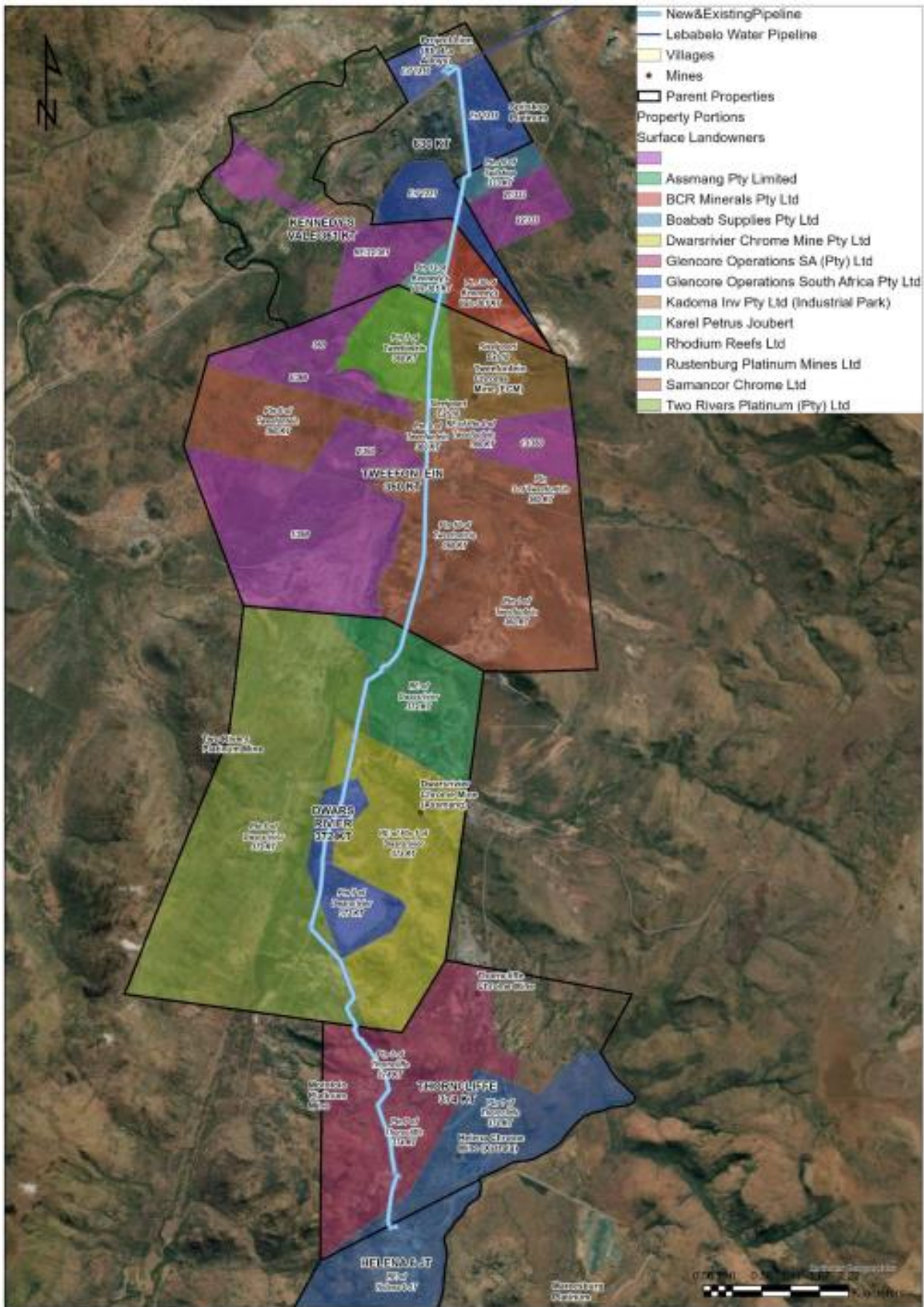


Figure 1:2 LWUA SE2 pipeline project: Property and landowner map

1.4 Applicant

The applicant for the project is Lebalelo Water User Association (LWUA). The details of the applicant are shown in Table 1:3.

Table 1:3 Details of the applicant

Applicant	Lebalelo Water User Association
Contact person	Bertus Bierman
Postal Address	PO Box 2075 Polokwane 0700
Telephone number:	013 216 8000
Fax number:	086 634 3967
Email address	info@lebalelo.co.za

1.5 Details of the Environmental Assessment Practitioner

Table 1:4 provides the details of the Environmental Assessment Practitioner (EAP) for the project.

Table 1:4: Details of the EAP

Environmental Assessment Practitioner	Suzanne van Rooy
Company	Alta van Dyk Environmental Consultants cc
Qualifications	MPhil Environmental Management (University of Stellenbosch)
Professional Registrations	Pr.Sci.Nat (Reg nr.400378/11)
Postal Address	Postnet Suite # 745 Private Bag X 1007 Lyttelton 0140
Telephone number:	012 940 9457
Fax number:	086 634 3967
Email address	suzanne@avde.co.za

1.5.1 Qualifications of the EAP

Suzanne van Rooy's qualifications include the following:

- Bachelor of Science in Geography and Zoology;
- Bachelor of Science with Honours in Aquatic Health; and
- Master of Philosophy in Environmental Management.

Suzanne is registered as a Professional Scientist of Nature (Pr. Sci. Nat) in Environmental Science with the South African Council for Natural Scientific Professions (SACNASP), registration number 400378/11.

1.5.2 Summary of the EAP's experience

Suzanne is a senior environmental scientist and has 13 years' experience as an environmental assessment practitioner, having worked largely in South Africa's mining sector. She is a professionally registered

environmental scientist with the South African Council of Natural Scientific Professionals (registration number 400378/11). Her field of expertise includes the compilation of environmental impact assessments and environmental management programmes, environmental auditing and stakeholder engagement.

Refer to Appendix A for the Curriculum Vitae of the EAP.

1.6 Specialists

Table 1:5 details the specialist studies undertaken for the proposed SE2 pipeline project.

Table 1:5 Specialist studies undertaken for the SE2 pipeline project

Specialist study	Specialist	Expertise of specialist
Vegetation	Andrew Husted	MSc Aquatic Health
Wetland	<i>The Biodiversity Company (TBC)</i>	<i>Pr.Sci.Nat</i>
Heritage	Jaco van der Walt <i>Beyond Heritage</i>	MA Archaeology

1.7 Assumptions, qualifications and limitation

The assumptions and limitations pertaining to this BAR are presented in Table 1:6 below.

Table 1:6: Qualifications, assumptions and limitations

Aspect	Qualifications, assumptions and limitation
General	<ul style="list-style-type: none"> It is assumed that AVDE has been provided with all relevant project information and that it was correct and valid at the time it was provided. There will be no significant changes to the project description or surrounding environment between the completion of the Basic Assessment process and implementation of the proposed project that could substantially influence findings and recommendations with respect to mitigation and management. The assessment of the mitigated scenario assumes that the design controls and recommended mitigation would be implemented adequately.
Cumulative assessment	<ul style="list-style-type: none"> All identified impacts are considered in a cumulative manner such that the impacts of the current activities on and surrounding the site and those potentially associated with the proposed project are discussed and assessed together. The baseline conditions reflect the effects of the current activities within the project area.
Wetland and vegetation assessment	<ul style="list-style-type: none"> Only a single season survey wetland assessment was conducted, this would constitute a dry season survey; The vegetation assessment was based on on desktop information alone only, and information provided should be interpreted accordingly, The wetlands within the project area that would be traversed by the pipeline were the focus for the assessment, these systems were ground-truthed and further assessed. Wetland areas beyond the project area but within the 500 m regulated area not considered to be at any appreciable level of risk were only considered at a desktop level; and The GPS used for delineations is accurate to within five meters. Therefore, the wetland delineation plotted digitally may be offset by at least five meters to either side.

Aspect	Qualifications, assumptions and limitation
Heritage	The authors of the Heritage Impact Assessment (HIA) acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. Similarly, the depth of cultural deposits and the extent of heritage sites cannot be accurately determined due its subsurface nature. The HIA report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. During the survey, it was not possible to walk the entire line due to access limitations within active mining areas and a river crossing. The HIA did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of the HIA.

1.8 Content of the Draft Basic Assessment Report

The Draft BAR has been compiled in accordance with the requirements of Government Notice R982 dated 45 December 2014 (as updated), Section 3 of Appendix I. These requirements and the sections of this Draft BAR in which they are addressed, are summarised in Table 1:7.

Table 1:7: Requirements of the BAR

No	Description	Reference
3 (1)	A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-	
a)	details of:	
	(i) the EAP who prepared the report; and	Section 1.5
	(ii) the expertise of the EAP, including a curriculum vitae;	Section 1.5.1 Section 1.5.2 Appendix A
b)	The location of the activity, including:	Section 1.3
	(i) the 21 digit Surveyor General code of each cadastral land parcel	Table 1.2
	(ii) where available, the physical address and farm name;	Table 1.2
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	N/A
c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale	Figure 1.1 Appendix B
d)	A description of the scope of the proposed activity, including:	
	(i) All listed and specified activities triggered and being applied for	Table 5:1
	(ii) A description of the associated structures and infrastructure related to the development	Section 4
e)	A description of the policy and legislative context within which the development is proposed including	
	(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report;	Section 5.1 Section 5.2
	(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 5.1 Section 5.2

No	Description	Reference
f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location	Section 2
g)	A motivation for the preferred site, activity and technology alternative	Section 3
h)	A full description of the process followed to reach the proposed development footprint within the approved site, including:	
	(i) Details of all the alternatives considered;	Section 3
	(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 6
	(iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them	Appendix C2
	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
	(v) The impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources, and can be avoided, managed or mitigated	Table 8.1 Table 8.2
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Section 8.1
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Table 8.1 Table 8.2
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Table 8.1 Table 8.2
	(ix) The outcome of the site selection matrix	N/A
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	N/A
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity	Section 3
i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including:	
	(i) A description of all environmental issues and risks that were identified during the environmental impact assessment process	Section 8.2 Table 8.1 Table 8.2
	(ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 8.2 Table 8.1 Table 8.2
j)	An assessment of each identified potentially significant impact and risk, including:	
	(i) Cumulative impacts	Section 8.3
	(ii) The nature, significance and consequences of the impact and risk	Section 8.2 Table 8.1
	(iii) The extent and duration of the impact and risk	
	(iv) The probability of the impact and risk occurring	Table 8.2
	(v) The degree to which the impact and risk can be reversed	

No	Description	Reference
	(vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and	
	(vii) The degree to which the impact and risk can be avoided, managed or mitigated	
k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section 9.2
l)	An environmental impact statement which contains-	
	(i) A summary of the key findings of the environmental impact assessment	Section 9.1
	(ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and the infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers	Section 9.2
	(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Table 9.1
m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Appendix E
n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Section 9.2
o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.7
p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 9.3
q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised	N/A
r)	An undertaking under oath or affirmation by the EAP in relation to (i) The correctness of the information provided in the reports (ii) The inclusion of comments and inputs from stakeholders and I&APs (iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Section 10 Appendix F
s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
t)	Where applicable, any specific information required by the competent authority; and	None to date
u)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 PROJECT MOTIVATION

2.1 Background to LWUA

The LWUA is a water management institution established in terms of Section 92 of the National Water Act (Act 36 of 1998) (NWA) and its area of operation and constitution were approved by the Minister of Water Affairs and Forestry (as it was known then) in terms of Section 92 (1) (a) of the NWA as confirmed in Government Gazette Notice No. 89 of 1 February 2002. The area of operation of the LWUA was extended in terms of Section 92 (1) (b) of the NWA by Government Gazette Notice Number 1110 of 18 November 2005 and the amended LWUA Constitution was approved by the then Minister of Water Affairs and Forestry on 4 October 2005.

The LWUA was established with the following mandate:

- To operate and maintain a pipeline scheme to supply bulk raw water from the Olifants River to satisfy the water requirements of its members on the Eastern Limb of the Bushveld Igneous Complex within its licensed conditions;
- To supply bulk raw water from the pipeline and any extension thereof from the Olifants River to satisfy the requirements of other users within its licence conditions;
- As a Corporate Social Responsibility undertaking to continue with its support to the Department of Water and Sanitation (DWS) and the Sekhukhune District Municipality in the operation and maintenance of their potable water schemes, provided that the schemes are situated within the area of operation of the LWUA; and
- To protect the LWUA infrastructure.

2.2 Need and desirability of the project

The LWUA was established to supply raw water to mines along the Eastern Limb of the Bushveld Igneous Complex. The main aim of the project was to supply water to a number of existing and planned new mines in the area, and as a spin-off, to provide additional capacity in the water supply scheme to meet the requirements of the rural population in the area. Only raw water is provided by LWUA, and the responsibility of treatment to drinking water standards lies with the distribution authority. The users receiving the water from the pipeline make up the LWUA. The Lebalelo water supply forms part of the Olifants River Water Resource Development Project (ORWRDP). The water is currently abstracted from the Olifants River via the Flag Boshielo Dam and abstracted at the Havercroft weir. In future, water will be abstracted from the Steelpoort River via De Hoop Dam.

Flag Boshielo Dam was originally constructed to mainly supply water for irrigation, domestic use and the transfer of water to Polokwane for domestic use. To alleviate the water demand on the resource resulting not only in a water deficit, but also in a lack of an allocation supporting the Ecological Reserve and providing for the expected future growth in the region, especially in regard to mining, the yield of the system was increased by raising Flag Boshielo Dam. The members of the LWUA agreed to fund and participate in the raising of the Flag Boshielo Dam wall, to secure its licenced abstraction allocation. Furthermore, in terms of Phase 2A of the ORWRDP, the DWS agreed to build and fund the De Hoop Dam. The De Hoop Dam was completed in 2014 and together with the Flag Boshielo Dam proportionally contribute to the ecological Reserve of the system and increase the assurance of supply to LWUA and its members located within the area. The yield of the De Hoop Dam also makes allowance for downstream domestic requirements.

To achieve the strategic goal as set forth by the DWS within the Olifants Water Management Area Integrated Strategic Perspective, a portion of the water allocation licenced to LWUA must be transferred to the De Hoop Dam to facilitate the use of the water by certain members of the LWUA (mines) located within the Steelpoort sub-area. This transfer of a portion of the lawful allocation to be abstracted at De Hoop Dam instead of Flag

Boshielo Dam will alleviate the pressure on the Flag Boshielo Dam. Once the portion of the allocation is transferred to the De Hoop Dam for abstraction, LWUA requires the SE2 pipeline from Spitskop Pump Station to Mototolo Mine to provide more water in the Steelpoort area for its members (refer to Figure 2:1) as the existing SE1 pipeline upstream of the Spitskop Pump Station does not have the capacity to transport more than 12Mℓ/day from the Havercroft reservoirs to members along the route.

The SE2 pipeline and associated infrastructure project is therefore required to augment the existing water supply to the following entities: Lion Smelter, Dwarsrivier, Two Rivers and Mototolo mines, and potentially to Steelpoort Industrial Park.

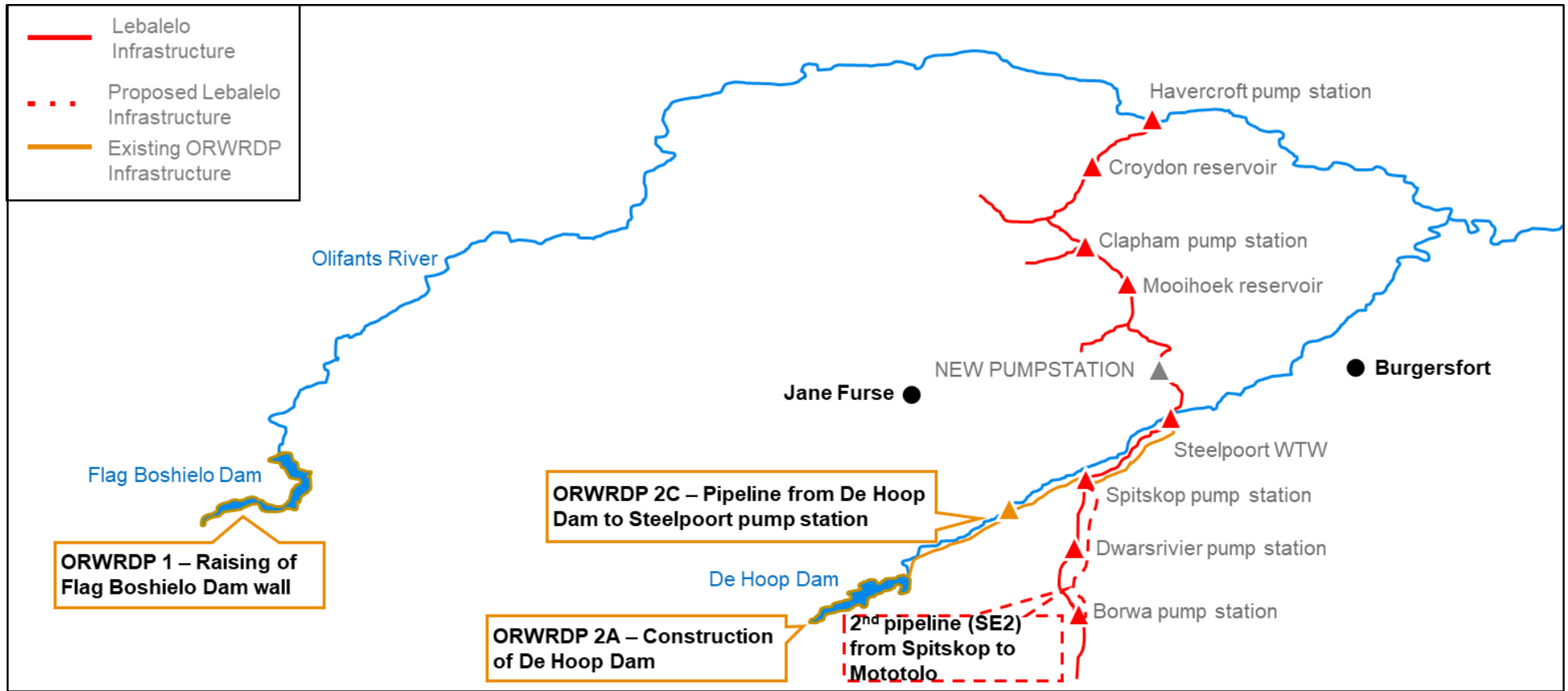


Figure 2:1 Current and proposed LWUA pipelines (SE1 and SE2)

3 ALTERNATIVES CONSIDERED

The single most effective method of environmental conservation practice in a pipeline project is the selection of the pipeline route. A properly selected route will generally result in potential environmental impacts associated with pipeline construction being avoided or greatly minimised in contrast to a poorly selected route which, despite adherence to timing constraints and use of state of the art construction techniques, will typically be less effective in conserving sensitive environments and resources.

The following factors are typically considered during the pipeline route selection process to conserve soils, aquatics, wetlands, natural vegetation, wildlife, heritage resources and cultural/traditional use sites:

- minimise pipeline length in order to minimise potential disturbance to soils, aquatics, wetlands, natural vegetation, wildlife, heritage resources and cultural / traditional use sites;
- parallel existing linear developments (e.g. pipelines, roads, trails, cut lines, seismic lines, powerlines, rail lines) to minimise the overall area of disturbance to soils, aquatics, wetlands, natural vegetation, wildlife, heritage resources and cultural / traditional use sites;
- minimise number of watercourse crossings and cross watercourses at right angles to conserve aquatic resources;
- avoid, where practical, or minimise crossings of to conserve wetlands, natural vegetation, wildlife habitat and cultural / traditional use sites;
- avoid or minimise length on sensitive landscapes to conserve natural vegetation, wildlife habitat and cultural / traditional use sites;
- avoid known archaeological or historical sites or areas of high archaeological or paleontological potential, where practical, to conserve heritage resources;
- adhere to setbacks distances from important natural features;
- avoid known ceremonial/spiritual sites, habitation sites and resource gathering sites to conserve traditional use sites of ethnic groups.

Other routing criteria which influence more the human environment but are equally important include:

- avoid, where practical, special land use areas (e.g. golf courses, research farms, certified organic farms, flood irrigated lands, lands with drainage tiles);
- avoid non-compatible land uses (e.g. aggregate extraction, open pit mines, extensively developed areas);
- avoid residences, urban areas, parks and designated natural areas; and
- adhere to regulatory setbacks and offsets given based on the type of liquid to be transported within the pipeline.

3.1 Pipeline route alternatives

The sections below provide details on the various options considered for the SE2 pipeline route.

3.1.1 SE2 pipeline: Spitskop Pump Station to Dwarsrivier Pump Station

In this option, the proposed SE2 pipeline will be situated within the current SE1 pipeline servitude, and will run from Spitskop Pump Station to Dwarsrivier Pump Station. A take-off is provided from the existing 2C pipeline (from De Hoop Dam) at the Spitskop Pump Station. The water is then conveyed to the new reservoir at Dwarsrivier Pump Station, with offtakes along the route for Lion Smelter, Dwarsrivier and Two Rivers mining houses. All offtakes will be flow controlled and flow will be limited to each offtake using flow control valves. Refer to Figure 3:1. This alternative will have the lowest environmental impact, as it will be constructed within the existing SE1 servitude where disturbance has already taken place, and is therefore the preferred alternative.



SE2 Pipeline: Spitskop Pump Station to Dwarsrivier Pump Station

Figure 3:1

Figure 3:1 SE2 pipeline -Spitskop Pump Station to Dwarsrivier Pump Station

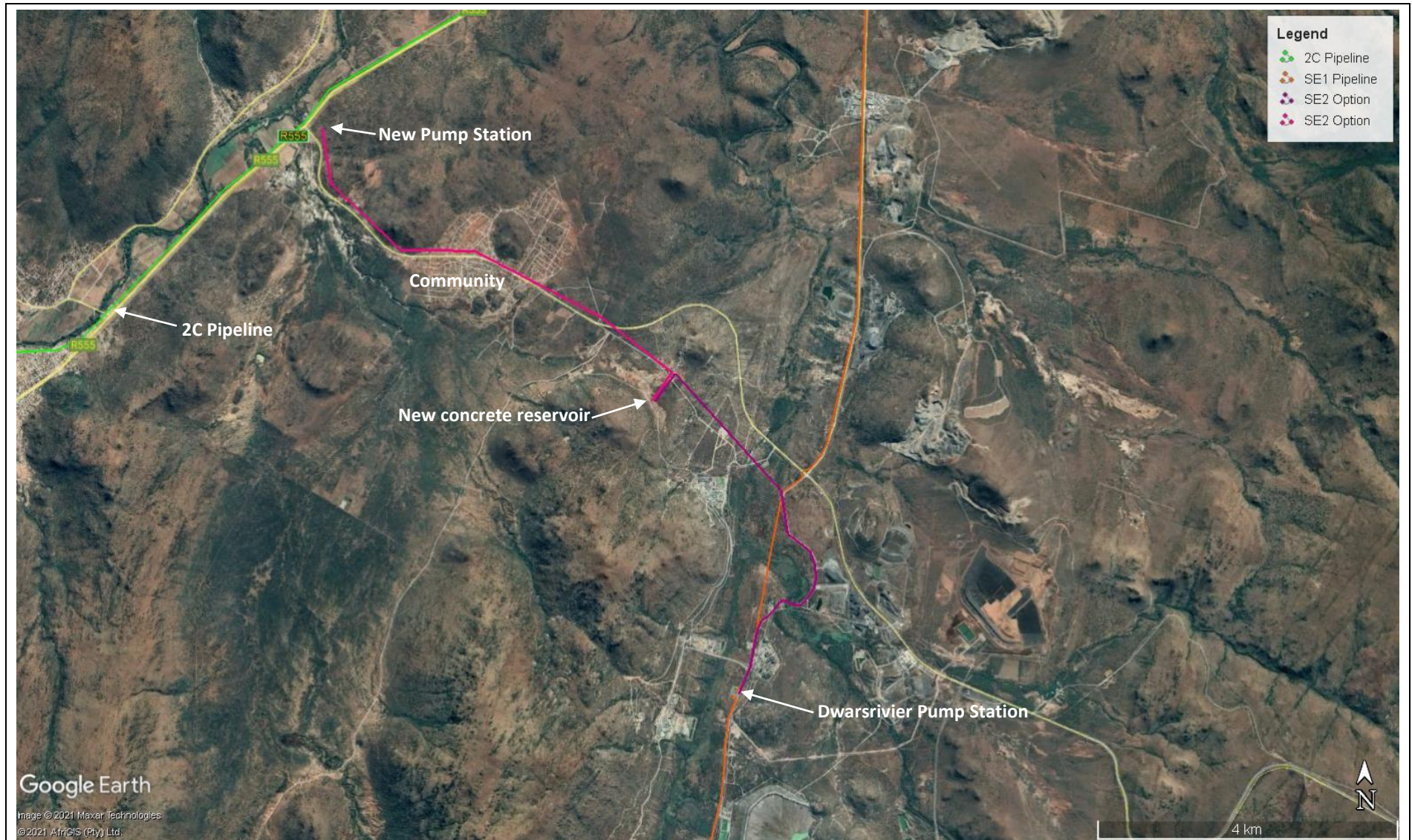
3.1.2 SE2 Pipeline: New Pump Station to Dwarsrivier Pump Station

In this option, water will be intercepted earlier from the 2C pipeline between De Hoop Dam and Spitskop Pump Station. A proposed new pump station will be placed from a new offtake on the 2C pipeline and a new reservoir will be constructed on top of a ridge in order for the water to gravity feed to Dwarsrivier, Two Rivers and Mototolo mines on site storage reservoirs. Refer to Figure 3:2.

This pipeline route will require a new servitude and will run through a community. This option is not preferred as the new pipeline route will impact on areas not previously disturbed, and will run through a community which will be affected during the construction process.

3.1.3 SE2 Pipeline: Dwarsrivier Pump Station to Mototolo Mine

In this option, water will be conveyed from the new reservoir at Dwarsrivier Pump Station to the onsite storage reservoir at Mototolo Mine. This section of the proposed SE2 pipeline will be situated within the current SE1 pipeline servitude. The new proposed Dwarsrivier Pump Station adjacent to the existing pump station will pump the water to the Mototolo Mine reservoir by means of a proposed 300/350 mm diameter pipeline within the current servitude. Refer to Figure 3:3. As this section of the proposed SE2 pipeline will be located within the current SE1 pipeline servitude, it will have the lowest environmental impact and is therefore the preferred alternative.



SE2 Pipeline: New Pump Station to Dwarsrivier Pump Station

Figure 3:2

Figure 3:2 SE2 Pipeline - New Pump Station to Dwarsrivier Pump station

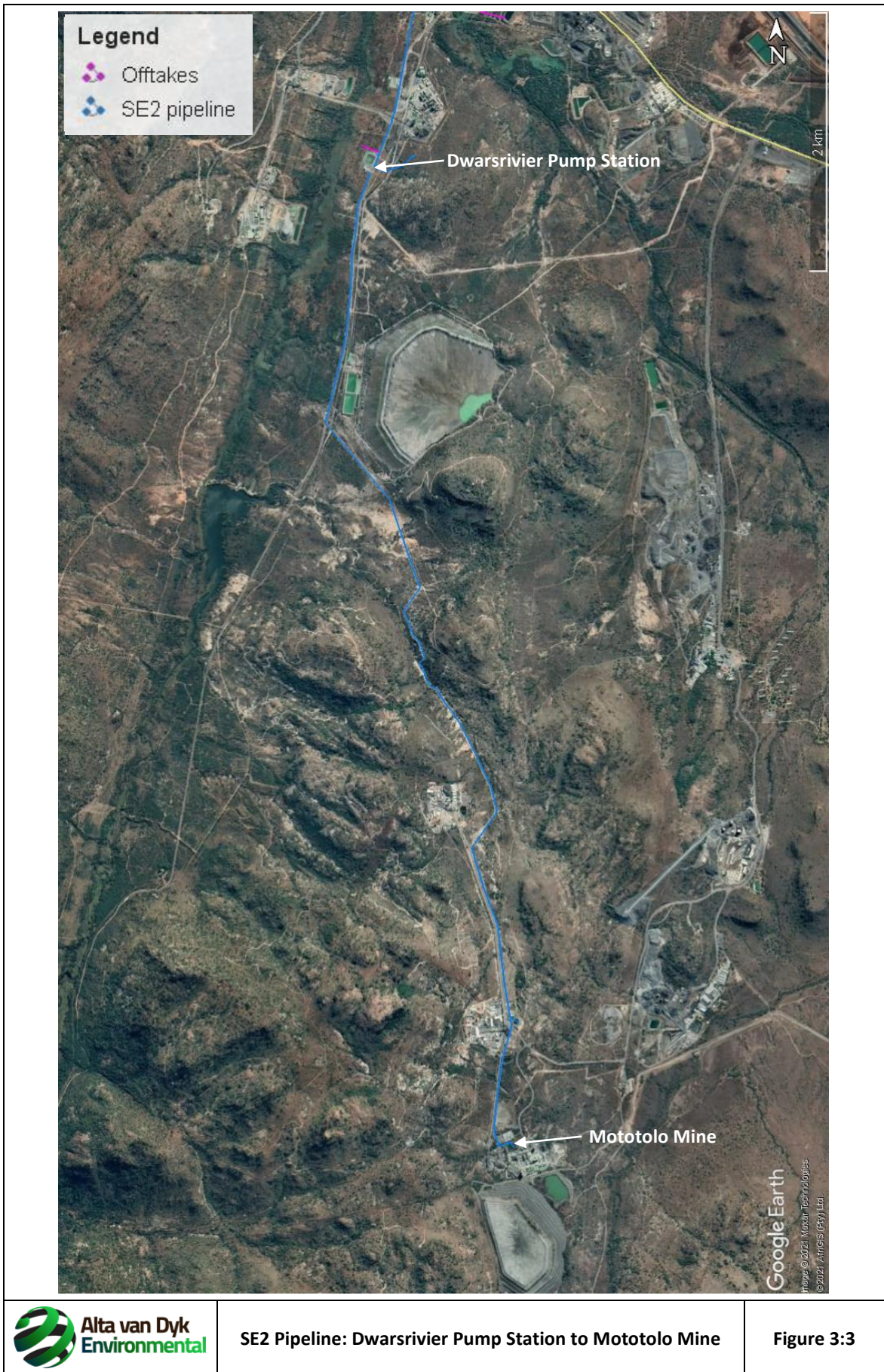


Figure 3:3 SE2 Pipeline - Dwarsrivier Pump station to Mototolo Mine

3.2 Reservoir alternatives

Two reservoir options near Dwarsrivier Pump Station were considered. The first option is to place the new reservoir adjacent to the current reservoir at Dwarsrivier Pump Station. The second option is to place the new reservoir closer to Two Rivers Mine, at a higher elevation. Refer to Figure 3:4.

Option 2 is the preferred as option, as this allows the water to gravitate form the reservoir to the Dwarsrivier Pump Station, as well as to the Dwarsrivier and Two Rivers onsite storage reservoirs.

From an environmental perspective, either option is acceptable, as the area for the proposed reservoir remains the same, and subsequently the same footprint area will have to be cleared. No heritage features are near either option and both areas are adjacent to already disturbed areas (Dwarsrivier Pump Station and Two Rivers Mine.).

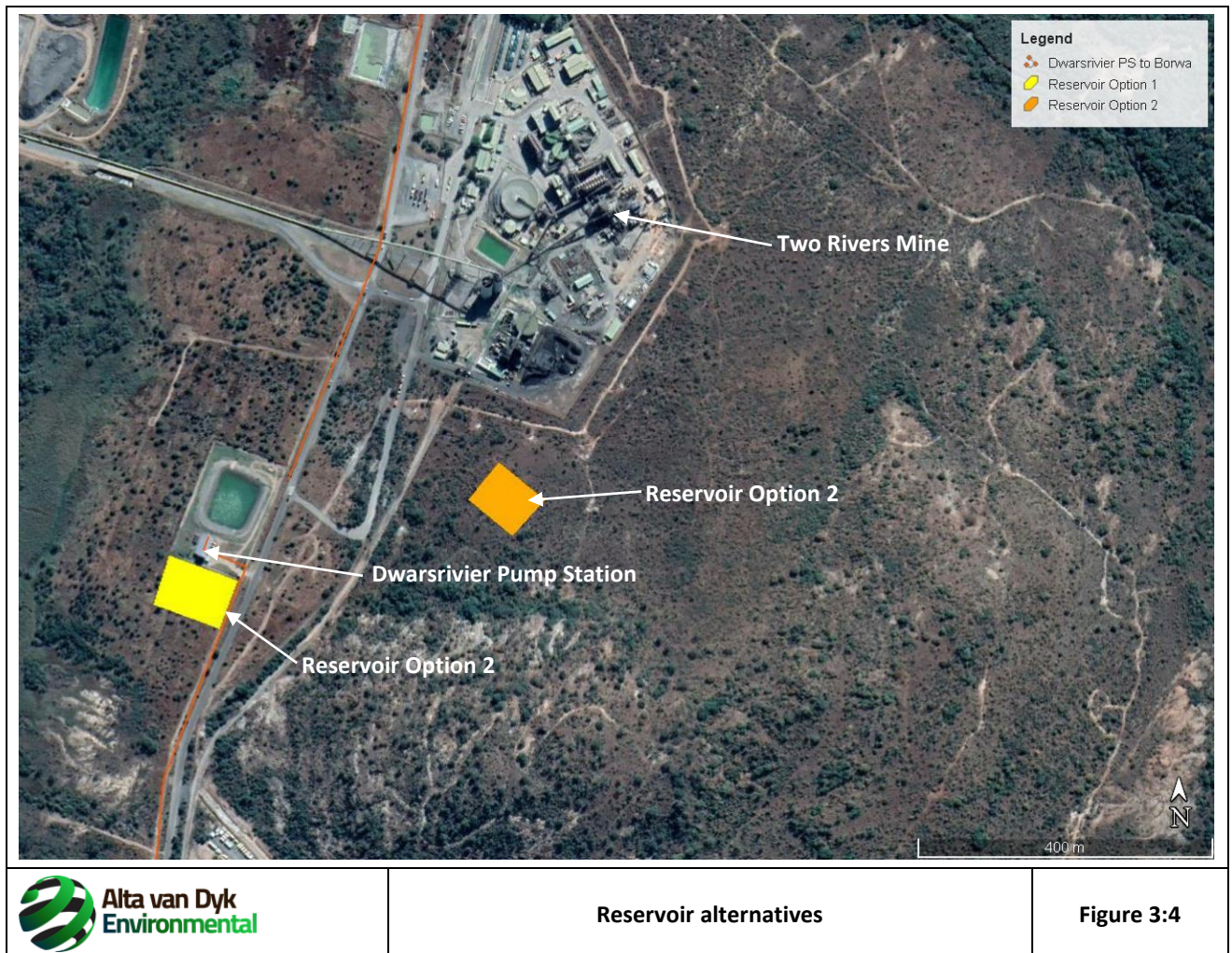


Figure 3:4 Reservoir options

3.3 No-go option

The no-go option will entail not constructing the proposed SE2 pipeline, or the associated infrastructure including new pump stations and the 10ML reservoir, and to continue as per the current status quo and environmental baseline. In addition, the environmental impacts identified in Section 8, would not occur.

Should the proposed SE2 pipeline project not go-ahead, it will have the following implications:

- The SE1 pipeline will be the only source of water for Lion Smelter, Dwarsrivier Mine, Two Rivers Mine, Mototolo Mine and Steelpoort Industrial Park (potentially);
- LWUA will not be able to meet the water requirements of its members and will thereby not be able to fulfil its mandate of providing raw water to its members;
- LWUA will not be able to utilise the full volume of raw water allocated to them by the DWS;
- The mines and industries that should receive the additional water will not be able to continue with new developments as the increased water requirements will not be met. This could potentially lead to closure of certain mining or production activities, which could lead to loss of employment and socio-economic benefits.

As indicated in Section 8 of this report, all negative environmental impacts identified during the basic assessment can be reduced to low significance with the implementation of various mitigation measures. In addition, the proposed SE2 pipeline will be situated within the existing SE1 pipeline servitude, and therefore any environmental impacts will be limited to an area that was previously disturbed. The no-go option is therefore not preferred.

4 PROJECT DESCRIPTION

4.1 Proposed SE2 pipeline and associated infrastructure


The following is proposed for the new pipeline (SE2) project:

- New pump station at existing Spitskop Pump Station (within fenced area of existing Spitskop pump station);
- Solar panels (75 x 75m) to be constructed within fenced area of existing Spitskop pump station. This is for a 0,5MW solar panel generation plant;
- New 500mm pipeline 15km in length next to the existing pipeline (within the pipeline servitude) to the existing Dwarsrivier Pump Station;
- New reservoir to be constructed near the existing Dwarsrivier Pump Station (10Mℓ);
- New pump station at the existing Dwarsrivier Pump Station on land directly next to the existing pump station fenced off area;
- New 300 or 350mm pipeline 9km in length next to the existing pipeline in the pipeline reserve from the new Dwarsrivier pump station to Mototolo Mine; and
- Valve chambers along pipeline route.

4.2 Location of proposed infrastructure

Table 4:1 and Table 4:2 details the location of the proposed infrastructure and watercourse crossings respectively. The locality of the proposed infrastructure is illustrated in Appendix B.

Table 4:1 Location of SE2 pipeline and associated infrastructure

Description	Coordinates	Location
New Spitskop Pump Station	24°48'37.01"S 30° 7'15.65"E	

Description	Coordinates	Location
Solar panels	24°48'33.90"S 30° 7'20.34"E	 <p>An aerial photograph showing a water treatment facility. A large, irregularly shaped reservoir is the central feature, filled with greenish water. To the left of the reservoir is a small building with a grey roof. The entire facility is enclosed by a blue boundary line. A large area of land to the right and top-right of the reservoir is highlighted in yellow, indicating the location for solar panels. Orange lines show a network of paths or pipelines. A road labeled 'R555' is visible on the right side of the image.</p>
Raw water pipeline between Spitskop PS and Dwarsrivier PS	Start: 24°48'37.68"S 30° 7'17.04"E End: 30° 6'18.66"E 30° 6'3.84"E	Refer to Figure 1:1.
Reservoir	24°56'19.26"S 30° 6'18.66"E	 <p>An aerial photograph showing a reservoir and its surroundings. The reservoir is in the lower-left quadrant. A network of orange lines represents a pipeline system connecting the reservoir to other parts of the facility. A blue line traces a path across the landscape. A yellow highlighted area is visible on the right side of the image. The terrain is arid with sparse vegetation.</p>


Description	Coordinates	Location
New Dwarsrivier Pump Station	30° 6'18.66"E 30° 6'3.84"E	
Raw water pipeline between Dwarsrivier PS and Mototolo Mine	Start: 30° 6'18.66"E 30° 6'3.84"E End: 25° 0'33.03"S 30° 6'46.14"E	Refer to Figure 1:1.

Table 4:2 Location of SE2 pipeline watercourse crossings

ID	Coordinates		Water resource type
	Latitude	Longitude	
C1	24°50'18.58"S	30° 7'20.31"E	Ephemeral watercourse
C2	24°50'40.74"S	30° 7'15.67"E	Drainage Feature
C3	24°50'53.36"S	30° 7'13.03"E	Drainage Feature
C4	24°51'45.19"S	30° 7'5.63"E	Drainage Feature
C5	24°51'47.91"S	30° 7'5.51"E	Ephemeral watercourse
C6	24°52'57.00"S	30° 7'3.46"E	Ephemeral watercourse
C7	24°54'37.18"S	30° 6'46.29"E	Drainage Feature
C8	24°55'23.18"S	30° 6'20.92"E	HGM 1 – Unchanneled Valley Bottom
C9	24°56'45.07"S	30° 5'59.60"E	Drainage Feature
C10	24°57'23.21"S	30° 5'53.34"E	Drainage Feature
C11	24°57'26.51"S	30° 5'52.44"E	Drainage Feature
C12	24°57'48.22"S	30° 6'10.68"E	Drainage Feature
C13	24°57'50.73"S	30° 6'11.64"E	Drainage Feature
C14	24°57'51.39"S	30° 6'11.87"E	Drainage Feature
C15	24°57'51.87"S	30° 6'12.06"E	Drainage Feature
C16	24°57'53.54"S	30° 6'12.69"E	Drainage Feature
C17	24°57'55.73"S	30° 6'13.51"E	Drainage Feature
C18	24°57'57.54"S	30° 6'14.20"E	Drainage Feature
C19	24°58'1.68"S	30° 6'15.75"E	HGM 3 - Unchanneled Valley Bottom
C20	24°58'3.40"S	30° 6'16.44"E	HGM 3 - Unchanneled Valley Bottom
C21	24°58'29.49"S	30° 6'19.27"E	HGM 2 - Channelled Valley Bottom
C22	24°58'43.86"S	30° 6'29.61"E	Drainage Feature
C23	24°58'43.99"S	30° 6'29.71"E	Drainage Feature
C24	24°58'51.52"S	30° 6'34.22"E	Drainage Feature
C25	24°58'52.92"S	30° 6'34.96"E	Drainage Feature
C26	24°58'54.75"S	30° 6'35.92"E	Drainage Feature
C27	24°59'0.70"S	30° 6'39.06"E	Drainage Feature
C28	24°59'7.37"S	30° 6'40.96"E	Drainage Feature
C29	24°59'10.24"S	30° 6'39.10"E	Drainage Feature
C30	24°59'10.78"S	30° 6'38.70"E	Drainage Feature
C31	24°59'44.12"S	30° 6'42.28"E	Drainage Feature
C32	25° 0'17.53"S	30° 6'41.73"E	Ephemeral watercourse
C33	25° 0'19.02"S	30° 6'41.51"E	Drainage Feature

4.3 Construction of new infrastructure

4.3.1 New pump station at Spitskop Pump Station

A new pump station will be constructed next to the existing Spitskop Pump Station within the existing Lebalelo servitude. The existing connection point at the pump station will be used to abstract water from the existing DWS pipeline between the De Hoop Dam and the Steelpoort Pump Station. Excavations will be done by mechanical means and by hand and the excavated material stockpiled on the site and used for backfilling. Any surplus material will be spread and finished off in the area around the pump station in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as per the relevant drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete will preferably be obtained from a ready-mix plant within the area.

Once the concrete has reached sufficient strength, the shutters will be stripped off, the concrete finished and the backfilling around the structure done.

The pump station walls will consist of steel columns with filled in brick.

The above work will be carried out by hand making use of people with the required skills under management and supervision of the Contractor.

4.3.2 Raw water pipeline (Spitskop Pump Station to Dwarsrivier Pump Station)

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. This work will all be done in accordance with the levels as per the relevant drawings.

After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment.

The pipeline crosses the R555 and the road D1261_010 (adjacent to the Lion Smelter) and the road to Mashishing (D1212_05). The three pipeline crossings will be done by means of pipe jacking a sleeve underneath the roads and position the steel pipe through the sleeve. The ends of the sleeve will be closed off once the pipe is in position.

The total length of the pipeline is approximately 15 000m.

4.3.3 Concrete reservoir

A new 10ML reservoir will be constructed near the existing Dwarsrivier Pump Station. The work entails the following:

Excavations will be done by mechanical means and the excavated material will be spread and finished off in the area around the reservoir in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as shown on the drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete for the floor slab will preferably be obtained from a ready-mix plant within the area. The walls and roof of the reservoir utilise pre-fabricated modules to speed up the construction process and to limit construction activities on site.

The above work will be carried out by mechanical means and by hand making use of people with the required skills under management and supervision of the Contractor.

4.3.4 New pump station at Dwarsrivier Pump Station

A new pump station will be constructed next to the existing Dwarsrivier Pump Station.

Excavations will be done by mechanical means and by hand and the excavated material stockpiled on the site and used for backfilling. Any surplus material will be spread and finished off in the area around the pump station in the fenced off servitude.

Once the excavation has been completed a concrete blinding layer, approximately 50mm thick will be constructed. This will be followed by the fixing of steel reinforcement for the structure followed by the erection of shuttering according to the dimensions of the structure as per the relevant drawings.

After approval of shuttering and reinforcement for correctness the concrete will be cast, finished off, and after treatment of the concrete carried out to prevent it from drying out rapidly. Concrete will preferably be obtained from a ready-mix plant within the area.

Once the concrete has reached sufficient strength, the shutters will be stripped off, the concrete finished and the backfilling around the structure done.

The pump station walls will consist of steel columns with filled in brick. The above work will be carried out by hand making use of people with the required skills under management and supervision of the Contractor.

4.3.5 Raw water pipeline (Dwarsrivier Pump Station to Mototolo Mine)

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. This work will all be done in accordance with the levels as per the relevant drawings.

After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment.

The total length of the pipeline is approximately 8 500m.

4.3.6 Valve chambers

Concrete valve chambers will be constructed at approximately 200m intervals along the pipeline. Such valve chambers are mainly used for maintenance purposes.

At the positions of the valve chambers the trench excavations will be widened to provide working space for the workers. The floor area of the valve chambers will be trimmed and compacted using hand tools after the

concrete blinding layer will be constructed to provide a clean working area. This will be followed by the fixing of the steel reinforcement and erection of the shuttering.

Once the reinforcement has been inspected and approved the shuttering will be erected in accordance with the details on the drawings and the concrete cast using concrete from a ready-mix plant within the area.

After the concrete has gained sufficient strength, the shutters will be removed, the concrete finished off and the backfilling around the structures done and compacted and the areas finished off neatly. Any excess material will be spread over the area around the structures and finished off.

LWUA is also considering using pre-cast chambers, should it be a more viable option.

4.4 Maintenance activities during the operational phase

Once the SE2 pipeline is operational, several activities will be undertaken in order to maintain the pipeline in a working condition. Although the SE2 pipeline will mainly be buried, at certain watercourse crossings an overland structure may be utilised. Table 4:3 outlines the general maintenance activities that are planned for the SE2 pipeline.

Table 4:3 General maintenance activities for the SE2 pipeline (SRK, 2018)

Maintenance activity	Actions
Site inspections of the pipeline	<p>Undertake regular inspections to ensure that:</p> <ul style="list-style-type: none"> The pipeline structure remains structurally intact; The watercourses crossed are not blocked with sediment or debris; No erosion is occurring along river banks, at culverts and pipeline crossings; No new alien vegetation is encroaching Erosion structures (gabion and reno mattresses) remain intact
Removal of alien vegetation and establishment of indigenous vegetation at the watercourse crossings, culverts and erosion protection structures	<ul style="list-style-type: none"> Remove alien vegetation encroaching around pipeline
Removal of sediment, debris or nuisance vegetation at watercourse crossings	<ul style="list-style-type: none"> All sediment, debris, overgrowth of vegetation and waste rock from erosion control structures should be removed from the watercourse and pipeline crossings
Repair to erosional structures (such as gabions and reno mattresses)	<ul style="list-style-type: none"> Erosional structures such as gabions and reno matters must be repaired in a timely manner to prevent erosion from occurring.
Erosion Protection along the watercourse crossings	<ul style="list-style-type: none"> Areas along the watercourse and pipeline crossings that have been eroded should be backfilled with sediment or erosion protection structures Embankments along the watercourse should be stabilised and sloped
Encasing the pipeline at watercourse crossing	<ul style="list-style-type: none"> Disturbance to the local vegetation may occur during the concreting of the pipeline. Disturbance to the river banks due to concreting the pipeline may occur. There is potential for the contamination of wetlands resources if the concrete is spilled while mixing.

5 LEGAL FRAMEWORK

5.1 Legal Requirements

There are several regulatory requirements at local, provincial and national level with which the proposed project need comply to.

The key legal requirements include the following:

- National Environmental Management Act (Act No. 107 of 1998) (NEMA);
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA);
- National Water Act (Act No. 36 of 1998) (NWA);
- National Heritage Resources Act (Act No. 25 of 1998) (NHRA)

A brief summary of each of these legal requirements are provided in the following sections.

5.1.1 National Environmental Management Act

NEMA is the environmental framework legislation promulgated to ensure that the environmental rights contemplated in Section 24 of the Constitution of South Africa (Act 108 of 1996) are realized. NEMA sets out:

- The fundamental principles that need to be incorporated in the environmental decision making process;
- The principles that is necessary to achieve sustainable development;
- Provides for duty of care to prevent, control and rehabilitate the effect of significant pollution and environmental degradation; and
- It allows for the prosecution of environmental crimes.

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation issued by the competent authority (in this case the DEFF). In this context, the Environmental Impact Assessment (EIA) Regulations, 2014, promulgated in terms of NEMA, govern the process, methodologies and requirements for the undertaking of EIAs in support of EA applications. Listing Notices 1-3 in terms of NEMA list activities that require EA (NEMA listed activities). The EIA Regulations, 2014, lay out two alternative authorisation processes. Depending on the type of activity that is proposed, either a BA process or a Scoping and Environmental Impact Reporting (S&EIR) process is required to obtain EA. Listing Notice 11 lists activities that require a BA process, while Listing Notice 22 lists activities that require S&EIR. Listing Notice 33 lists activities in certain sensitive geographic areas that also require a BA process.

The following listed activities are being triggered by the proposed development of the SE2 pipeline and associated infrastructure.

Table 5:1: Triggered listed activities for the SE2 pipeline and associated activities

List and activity number	Listed activity	Description of activity
Listing 1 Activity 9	The development of infrastructure exceeding 1000 meters in length for the bulk transportation of water or storm water – (i) with an internal diameter of 0.36 meters or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where:	The development of the raw water pipeline between Spitskop Pump Station and Dwarsrivier Pump Station is 15km in length with an internal diameter of 500mm (0.5m), and therefore triggers this activity. The development of the raw water pipeline between Spitskop Pump Station and Mototolo Mine is with an internal

List and activity number	Listed activity	Description of activity
	<p>(a) such facilities or infrastructure are for bulk transportation of water, or storm water or storm water drainage inside a road reserve or railway line reserve; or</p> <p>(b) where such development will occur within an urban area</p>	<p>diameter of 300/350mm (0.3/0.35m), and therefore does not trigger this activity.</p>
Listing 1 Activity 19	<p>The infilling or depositing of any material of more than 10m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m³ from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>The proposed SE2 pipeline crosses several watercourses and earthworks will be required within these watercourses to construct the proposed pipeline.</p>
Listing 1 Activity 27	<p>The clearance of an area of 1 ha or more, but less than 20ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>Clearance of indigenous vegetation will take place for the proposed SE2 pipeline, but as it is a linear activity, this listed activity does not apply.</p> <p>However, the following areas will also be cleared:</p> <p>Solar panels (0.5 ha)</p> <p>New Spitskop Pump Station (0.16 ha)</p> <p>New reservoir at Dwarsrivier Pump Station (0.53ha)</p> <p>New Dwarsrivier Pump Station (0.2 ha)</p> <p>The cumulative clearance of indigenous vegetation is more than 1 ha.</p> <p>This activity is triggered.</p>
Listing 3 Activity 2	<p>The development of reservoirs excluding dams, with a capacity of more than 250m³.</p>	<p>A concrete reservoir with a capacity of 10Mℓ will be developed, within an Ecological Support Area, as per the Limpopo Conservation Plan (LCP).</p>
Listing 3 Activity 12	<p>The clearance of an area of more than 300m² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in</p>	<p>The proposed SE2 pipeline and associated infrastructure will require the clearing of more than 300m² of indigenous vegetation, within in areas listed as Critical Biodiversity areas and Ecological support areas as per the LCP.</p>

List and activity number	Listed activity	Description of activity
	accordance with a maintenance management plan.	
Listing 3 Activity 14	<p>The development of-</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>where such development occurs-</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>	The proposed SE2 pipeline crosses several watercourses, within in areas listed as Critical Biodiversity areas and Ecological support areas as per the LCP.

5.1.2 National Environmental Management: Biodiversity Act

The National Environmental Management: Biodiversity Act (NEM:BA) serves to provide a framework for the management and conservation of South African biodiversity, under the auspices of the NEMA. This legislation promotes the sustainable use of natural biological resources, ensuring equitable access and sharing of benefits arising from the use of biological resources. In terms of Section 56(1) of NEM:BA a person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7. These threatened and protected species have been listed in terms of GNR.151 of 2007: Publication of lists of critically endangered, endangered, vulnerable and protected species. A restricted activity in relation to a specimen of a listed threatened or protected species means:

- hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means, method or device whatsoever, including searching, pursuing, driving, lying in wait, luring, alluring, discharging a missile or injuring with intent to hunt, catch, capture or kill any such specimen;
- gathering, collecting or plucking any specimen of a listed threatened or protected species;
- picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species;
- importing into the Republic, including introducing from the sea, any specimen of a listed threatened or protected species;
- exporting from the Republic, including re-exporting from the Republic, any specimen of a listed threatened or protected species;
- having in possession or exercising physical control over any specimen of a listed threatened or protected species;
- growing, breeding or in any other way propagating any specimen of a listed threatened or protected species, or causing it to multiply;

- conveying, moving or otherwise translocating any specimen of a listed threatened or protected species;
- selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of a listed threatened or protected species; or
- any other prescribed activity which involves a specimen of a listed threatened or protected species.

Should a project result in the loss of biodiversity identified in terms of GN 151 of 2010, a permit application will need to be submitted to the Provincial Department of Environment and Nature Conservation for approval, before proceeding with the activity.

5.1.3 National Water Act

The purpose of the NWA is to ensure that the South Africa’s water resources are protected, used, developed, conserved, managed and controlled. Use of water for mining and related activities is also regulated through regulations that were updated after the promulgation of the NWA (Government Notice No. GN704 dated 4 June 1999). Sections 40 and 42 of NWA provides for the responsible authority to request public participation and an assessment of the likely effect of the proposed license the protection, use, development, conservation, management and control of the water resource.

Water uses that are not permissible in terms of Schedule 1 of the NWA need to be authorised under a tiered authorisation system as a General Authorisation in terms of the General Authorisations as published under section 39 of the NWA or as a water use licence, as provided for in terms of Section 21 of the NWA.

Table 5:2 list the water uses that require authorisation in terms of Section 21 of the National Water Act for the proposed development:

Table 5:2 List of Section 21 Water Uses to be applied for

Section 21 Water Use	Activities which require the Water Use Licence
(c) – impeding or diverting the flow of water in a watercourse (i) – altering the bed, banks, course or characteristics of a watercourse	<ul style="list-style-type: none"> • Watercourse crossing by SE2 pipeline • Activities to be undertaken with a horizontal distance of 100m from the edge of the watercourse and within 500m of a delineated wetland.

5.1.4 National Heritage Resources Act

The National Heritage Resources Act (NHRA) controls the protection and management of South Africa’s heritage resources.

Section 38 of the NHRA requires that heritage assessments are required for certain kinds of development such as the construction of a pipeline exceeding 300m in length, the construction of a bridge or similar structure exceeding 50 in length, rezoning of land greater than 10,000 m² in extent or exceeding three or more sub-divisions, or for any activity that will alter the character of a site greater than 5,000 m². The South African Heritage Resources Agency (SAHRA) administers heritage in the province particularly where archaeology and palaeontology are the dominant concerns.

The responsible heritage resources authority must, within 14 days of receipt of such a notification if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report or notify the person concerned that this section does not apply.

5.2 Planning policy framework

This section discusses a number of key formal planning policies relevant to the project. The policies and plans briefly discussed below include regional and local development and spatial plans, including the:

- Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA);
- Fetakgomo Tubatse Local Municipality Integrated Development Plan (2021)

5.2.1 Spatial Planning and Land Use Management Act

SPLUMA provides broad principles for provincial laws that regulate planning. SPLUMA also provides clarity on how planning law interacts with other laws and policies. SPLUMA delegates the responsibility for land use and zoning applications to the municipality. The land use, zoning and spatial planning is therefore driven by the municipal level IDP and SDF which, according to SPLUMA, must be aligned with the provincial IDP and SDF.

5.2.2 Fetakgomo Tubatse Local Municipality Integrated Development Plan (2021)

Integrated Development Planning is a process through which municipalities prepare a strategic development plan which extends over a five –year period. The Integrated Development Plan (IDP) is a product of this planning process. The Fetakgomo Tubatse Local Municipality IDP is the principal strategic planning instrument which gives guides and informs all planning, budgeting, management, and decision-making processes in the municipality.

Although the development of the SE2 pipeline and associated infrastructure does not fall directly into the IDP of Fetakgomo Tubatse Local Municipality, the development will contribute to water provision to industries in the Steelpoort area and will ensure the continuous development of mining and associated activities, which is a priority for the municipality.

6 PUBLIC PARTICIPATION PROCESS

Stakeholder engagement forms a key component of the Basic Assessment process. The objectives of stakeholder engagement are outlined in this section, followed by a summary of the approach followed in compliance with Chapter 6 of the EIA Regulations, 2014.

6.1 Pre-application consultation

A pre-application meeting was held with the competent authority, the Department of Fisheries, Forestry and Environment (DFFE) on 15 June 2021. During this meeting, the proposed project was introduced, and attendees were given the opportunity to raise any comments or concerns about the proposed project. Minutes of the pre-application meeting is available in Appendix C1.

It was confirmed telephonically by the case officer for the Water Use Licence Application (Lindelani Mbulaheni) of the Department of Water and Sanitation (DWS) that a pre-application meeting was not required.

A Background Information Letter (BIL) was compiled in English and distributed via email during September 2021 to the following identified stakeholders:

- Landowners along the proposed SE2 pipeline route;
- Head of planning and development at Fetakogomo Tubatse Local Municipality;
- Ward councillor 27 of Fetakogomo Tubatse Local Municipality;
- Director of Planning and Economic Development at Sekhukhune District Municipality;
- Director of Infrastructure and Water Services at Sekhukhune District Municipality;
- Head of communications of Roads Agency Limpopo;
- Head of Department of Public Works, Roads and Infrastructure at the Limpopo Provincial Government;
- Case officer at the Limpopo Department of Economic Development, Environment and Tourism (LEDET);
- Case officer at the DFFE (Matlhodi Mogorosi); and
- Case officer at the DWS (Lindelani Mbulaheni).

Refer to Appendix C3 for a list of stakeholders for this project. Refer to Appendix C4 for a copy of the BIL, and Appendix C5 for emails sent.

All comments received from stakeholders during the pre-application phase are included in the CRR (Appendix C2).

6.2 Project announcement

The proposed project was announced as follows:

- Distribution of notification letters via email to the competent authority, commenting authorities and all identified stakeholders (refer to list in Appendix C3) on 21 October 2021. Refer to Appendix C6 for a copy of the notification letter and Appendix C7 for emails sent. SMS/WhatsApp text messages were also sent to identified stakeholders;
- Placing site notices along the proposed SE2 pipeline route and pump stations. Refer to Appendix C8 for a copy of the site notice; and
- Advertisement in the Steelburger on 21 October 2021. Refer to Appendix C9 for proof of the advertisement.

6.3 Availability of the Draft Basic Assessment Report

The Draft Basic Assessment Report (BAR) is currently available for public comment for a period of 30 days from 27 October to 29 November 2021. The report is available at the public places as listed in Table 6:1.

Table 6:1 Public places for the availability of the Draft BAR for public comment

Public Place	Locality	Contact details
Lion Smelter Security Office	Kennedy's Vale, R555, Steelpoort	Kennedy Owuor 083 457 3486
Two Rivers Platinum Mine Plant Security Office	Farm Dwarsrivier 372 KT	Francois Vermeulen 082 300 2206
Alta van Dyk Environmental Consultants Office	4 Garcia Peak, Midlands Estate, Olifantsfontein	Suzanne van Rooy 012 940 9457

The Draft BAR is available electronically on the AVDE website:

<https://www.altavandykenvironmental.co.za/public-documents/>

Comments received during the comment period of the Draft BAR will be included in the CRR, to be submitted with the Final BAR to DFFE.

6.4 Final Basic Assessment Report

All comments obtained from stakeholders during the pre-application, announcement and Draft BAR comment phases, will be captured and addressed in the CRR. This report will be submitted as an Appendix to the Final Basic Assessment Report, to be submitted to the competent authority (DFFE) for review.

6.5 Decision

Once a decision regarding the environmental authorisation has been received from DFFE, all registered stakeholders will be informed via email and SMS/WhatsApp text.

6.6 Summary of comments received

All comments received from stakeholders during the pre-application phase of the project has been documented in the CRR (Appendix C2). Table 6:2 provides of summary of the comments received from stakeholders to date.

Table 6:2 Summary of comments received from stakeholders

Comment	Organisation
Please confirm the end water users for the pipeline, as this will determine the competent authority for this application.	DFFE
Provide all new and additional information regarding the LWUA SE2 pipeline project.	BCR Minerals, Mr Karel Joubert, and Baobab (Pty) Ltd

6.7 Legal requirements for public participation

Table 6:3 provides a review of the legal requirements for public participation in terms of the NEMA EIA Regulations.

Table 6:3: Legal requirements for public participation

NEMA Regulation	Public Participation Regulation	Process followed
39 (1)	If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.	As the proposed SE2 pipeline is a linear project, Section 39 (1) does not apply. Application for a 10ML reservoir is also made, and landowner consent for this activity was obtained and submitted with the environmental authorisation application.
41 (2) (a)	Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of— (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and any alternative site;	A2 notice boards was placed along the proposed SE2 pipeline route, as part of the project announcement. Refer to Appendix C8 for a copy of the site notice.
41 (2) (b)	Giving writing notice to	
(i)	The occupiers of the site	BILs were distributed via email to all landowners along the proposed SE2 pipeline route during the pre-application phase. Refer to Appendix C4 for a copy of the BIL, and Appendix C5 for emails sent.
(ii)	Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken	
(iii)	The municipal councillor of the ward	A BIL was emailed to Cllr C. Makua who is the Councillor for Ward 27. Refer to Appendix C5.
(iv)	The municipality which has jurisdiction in the area	A BIL was emailed to Cllr Q. Moeng who is head of planning and development at Fetakgomo Tubatse Local Municipality. In addition, BILs were emailed to Ms Molatelo Mabitsela (Director: Planning & Economic Development) and Mr. Maselaganye Matji (Director: Infrastructure & Water Services) at the Sekhukhune District Municipality.
(v)	Organ of state having jurisdiction in respect of any aspect of the activity	BILs were distributed via email to the following authorities: <ul style="list-style-type: none">• DFFE;• DWS;• Limpopo Department of Economic Development, Environment and Tourism (LEDET);• Head of communications of Roads Agency Limpopo;• Head of Department of Public Works, Roads and Infrastructure at the Limpopo Provincial Government; The Draft BAR was uploaded onto the South African Heritage Resources Information System (SAHRIS) website for comment from

NEMA Regulation	Public Participation Regulation	Process followed
		the South African Heritage Resources Agency (SAHRA).
(vi)	Any other party as required by the competent authority	None required to date.
41 (2) (c)	Placing an advertisement in one local newspaper	An advertisement was placed in the Steelburger Newspaper on 21 October 2021 to announce the proposed SE2 pipeline project. Refer to Appendix C9.
41 (2) (d)	Placing an advertisement in at least one provincial or national newspaper, if the activity may have an impact that extends beyond the boundaries of the metropolitan or district municipality.	Not applicable. The activity does not have an impact that extends beyond the boundaries of the metropolitan.
41 (2) (e)	Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to- (i) illiteracy; (ii) disability; or any other disadvantage	None required to date.
41 (3)	A notice, notice board or advertisement must: (a) give details of the application or proposed application which is subjected to public participation; and (b) state: (i) whether a basic assessment or S&EIR procedures are being applied to the application (ii) the nature and location of the activity to which the application relates (iii) where further information on the application can be obtained the manner in which and the person to whom representations in respect of the application or proposed application may be made	A2 notice boards were placed along the proposed pipeline route. Refer to Appendix C8 for a copy of the site notice.

7 ENVIRONMENTAL STATUS QUO

7.1 Topography

The project area is characterised by rugged topography with prominent north-south trending mountain ranges (the Steenkampsberge). Two deep valleys extend in a north-south direction between the Steenkampsberge mountain ranges and the Groot Dwars River (in the east) and the Klein Dwars River (in the west) are contained within these valleys.

7.2 Climate

According to the Köppen-Geiger classification of climate zones (Köppen 1936) the project area falls within the climate classified as Bsh = Hot semi-arid climates, this climate is characterized by relatively hot summers, mild winters and relatively low precipitation levels. The area is characteristically warm with erratic and extremely variable rainfall. The area receives summer rainfall and experiences extremely dry winters, with infrequent frost. Rainfall in the area of the Steelpoort valleys is low, around 500 mm per year. The average daily temperature ranges from a minimum of -0.9°C to a maximum of 37.3°C in the Steelpoort area (Mucina & Rutherford 2006), with an average of approximately 21°C (refer to Figure 7:1).

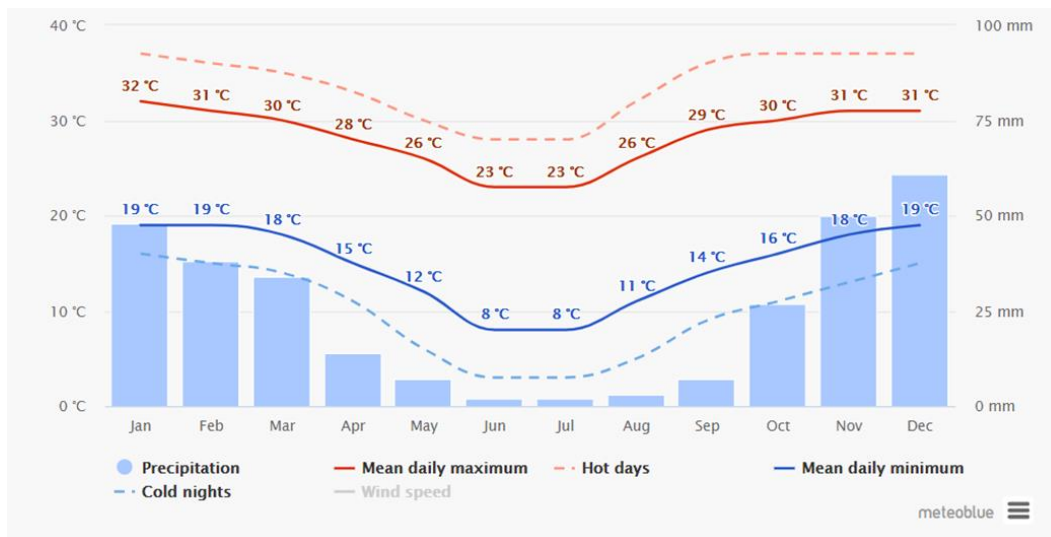


Figure 7:1 Steelpoort Monthly Temperatures, Precipitation and Wind speed (Meteoblue, 2021)

7.3 Surface water

The project falls within the Klein- and Groot Dwars and Dwars River catchments. The proposed pipeline traverses quaternary catchments B42G, B41H and B41J. Refer to Figure 7:2. The Dwars River joins the Steelpoort River, which in turn feeds into the Olifants River.

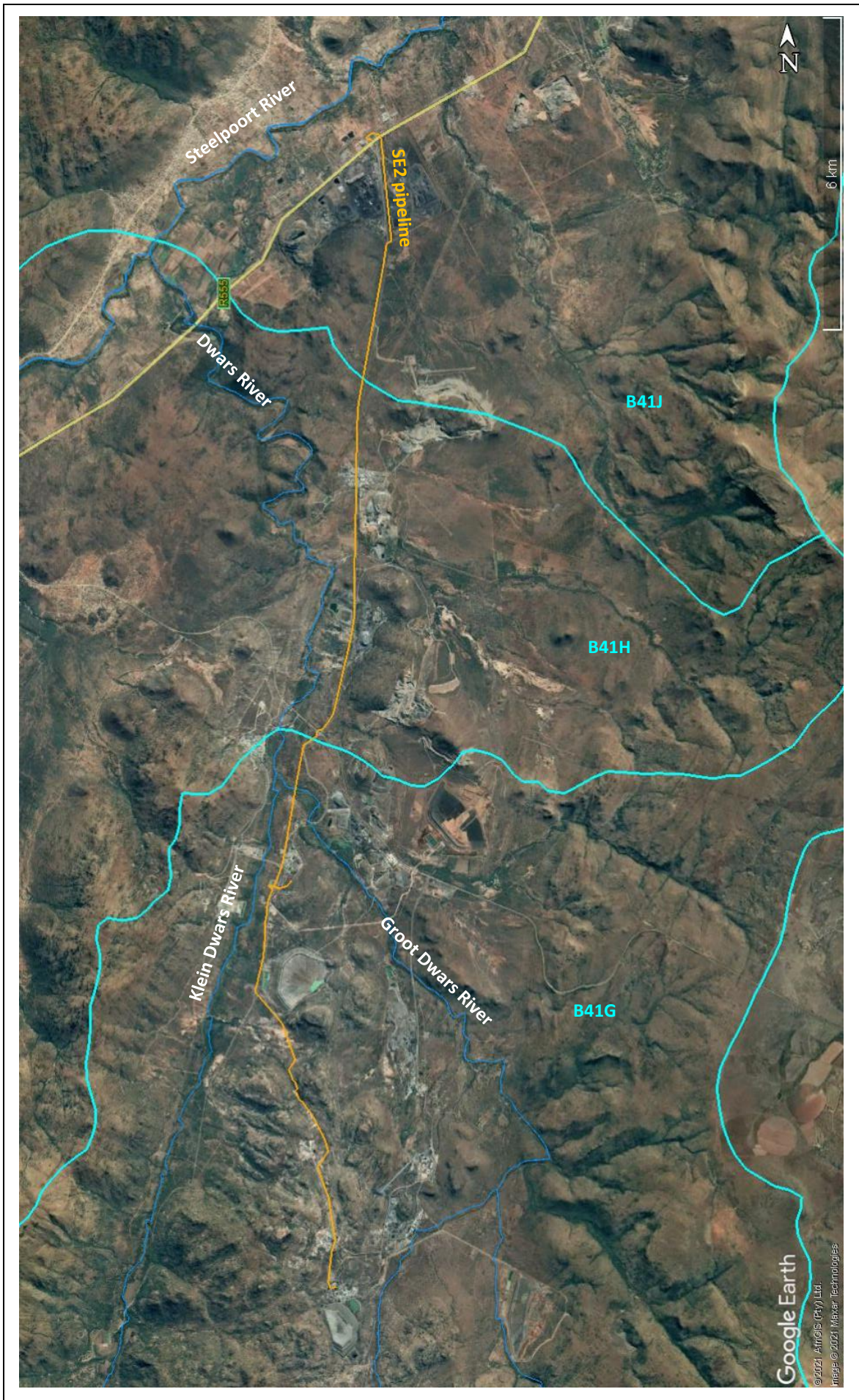


Figure 7:2 Surface water features of the SE2 pipeline project

7.4 Biome

The project area is situated in the Savanna biome (TBC, 2021). The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

- Seasonal precipitation; and
- (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006).

The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layers, over-topped by a discontinuous, but distinct woody plant layer. At a structural level, Africa’s savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Vachellia*, *Senegalia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

7.5 Vegetation

Information on vegetation was obtained from The Biodiversity Company’s (TBC) vegetation report for the proposed SE2 project, August 2021 (Appendix D1).

The following features describes the general area and habitat. This assessment is based on spatial data that are provided by various sources such as the provincial environmental authority and South African National Biodiversity Institute (SANBI). The desktop analysis and their relevance to this project are listed in Table 7:1.

Table 7:1 Desktop spatial features examined (TBC, 2021)

Desktop Information Considered	Relevant/Not relevant
Limpopo Conservation Plan	Most of the project area overlaps with Ecological Support Area 1 (ESA 1) and No Natural Remaining (NNR) areas, with one segment crossing over Critical Biodiversity Area 1 (CBA 1).
Ecosystem Threat Status	Most of the project area falls within an ecosystem which is listed as Least Concerned (LC) ecosystem, a small portion is listed as Endangered (EN).
Ecosystem Protection Level	The project area falls in a “poorly protected” area.
Biome	Located in the Savanna Biome.
Vegetation Type	The project area is situated within two vegetation types; the Sekhukhune Plains Bushveld and the Sekhukhune Mountain Bushveld.
National Freshwater Ecosystem Priority Areas (NFEPA) Rivers and Wetlands	The project area does overlap with a true FEPA wetland.
National Biodiversity Assessment (NBA) Wetlands	No wetlands are located within the regulation area.
Protected Areas	Irrelevant: No conservation areas are close to the project area. The nearest protected area is the De Hoop Dam Protected Environment more than 6 km west of the project area.

Desktop Information Considered	Relevant/Not relevant
Strategic Water Source Areas (SWSA)	Irrelevant: The project area does not fall within a SWSA.

The proposed SE2 project is situated within two vegetation types; the Sekhukhune Plains Bushveld and the Sekhukhune Mountain Bushveld, according to Mucina & Rutherford (2006) (TBC, 2021). Refer Figure 7:3.

7.5.1 Sekhukhune Plains Bushveld

The Sekhukhune Plains Bushveld occurs in the Limpopo and Mpumalanga Provinces, mainly in semi-arid plains and open valleys in between small mountains. The vegetation consists predominantly of open to close thornveld with large numbers of Aloe species (TBC, 2021).

According to Mucina and Rutherford (2006), this vegetation type is classified as Vulnerable (VU). The national target for conservation protection for this vegetation types is 19%, with approximately 2% statutorily conserved in Potlake, Bewaarkloof and Wolkberg Caves Nature Reserves. Approximately 25% of this area has been transformed and is mainly under dry-land subsistence cultivation.

7.5.2 Sekhukhune Mountain Bushveld

Sekhukhune Mountain Bushveld occurs in the Provinces of Limpopo and Mpumalanga. Although this vegetation type forms part of the Roosenekal Subcentre of the Sekhukhuneland Centre of Endemism (CE) with numerous endemic and undescribed plant species, it is classified as Least Concern by Mucina and Rutherford (2006) due to the low level of transformation.

According to Mucina and Rutherford (2006), this vegetation type is classified as Least threatened. The national target for conservation protection for this vegetation types is 24%, with none conserved in statutory conservation areas, but 0.4% conserved in Potlake Nature Reserve. Approximately 15% of this area has been transformed mainly by cultivation and urban built-up.

7.5.3 Plant species of conservation concern

Based on the Plants of Southern Africa (BODATSA-POSA, 2021) database, 767 plant species are expected to occur in the area.

Of the 767 plant species, 12 species are listed as being Species of Conservation Concern (SCC). Six (6) are provincially protected under the Limpopo Environmental Management Act (Act No. 7 of 2003, Schedule 12), while two species is a nationally protected tree under the National Forest Act (Act No. 84 of 1998).



Legend

- Pipeline (SE2)
- Vegetation
 - Sekhukhune Montane Grassland
 - Sekhukhune Mountain Bushveld
 - Sekhukhune Plains Bushveld

Project: LWUA Spitskop to Mototolo Pipeline
 Date: 04/08/2021
 Datum: WGS 84
 Compiler: A Husted

0 2.5 5 km

Limpopo Province Context

Figure 7:3 SE2 project vegetation type (TBC, 2021)

7.6 Wetlands and soils

Information on wetlands and soils were obtained from The Biodiversity Company's (TBC) wetland report for the proposed SE2 project, August 2021 (Appendix D1).

The wetland areas were delineated in accordance with the DWAF (2005) guidelines. Refer to Figure 7:4. Two wetland hydrogeomorphic (HGM) types were identified and delineated for the 500 m regulated area. These include both channelled and unchannelled valley bottom wetlands. Further to this, a network of drainage lines and ephemeral watercourses were also delineated. In addition, a few artificial dams were identified and delineated for this project. The pipeline will traverse three HGM units, namely HGM 1 and HGM 3 (unchannelled valley bottom) and HGM 2 (channelled valley bottom) wetlands. A photograph collage of the identified systems is presented in Figure 7:5.

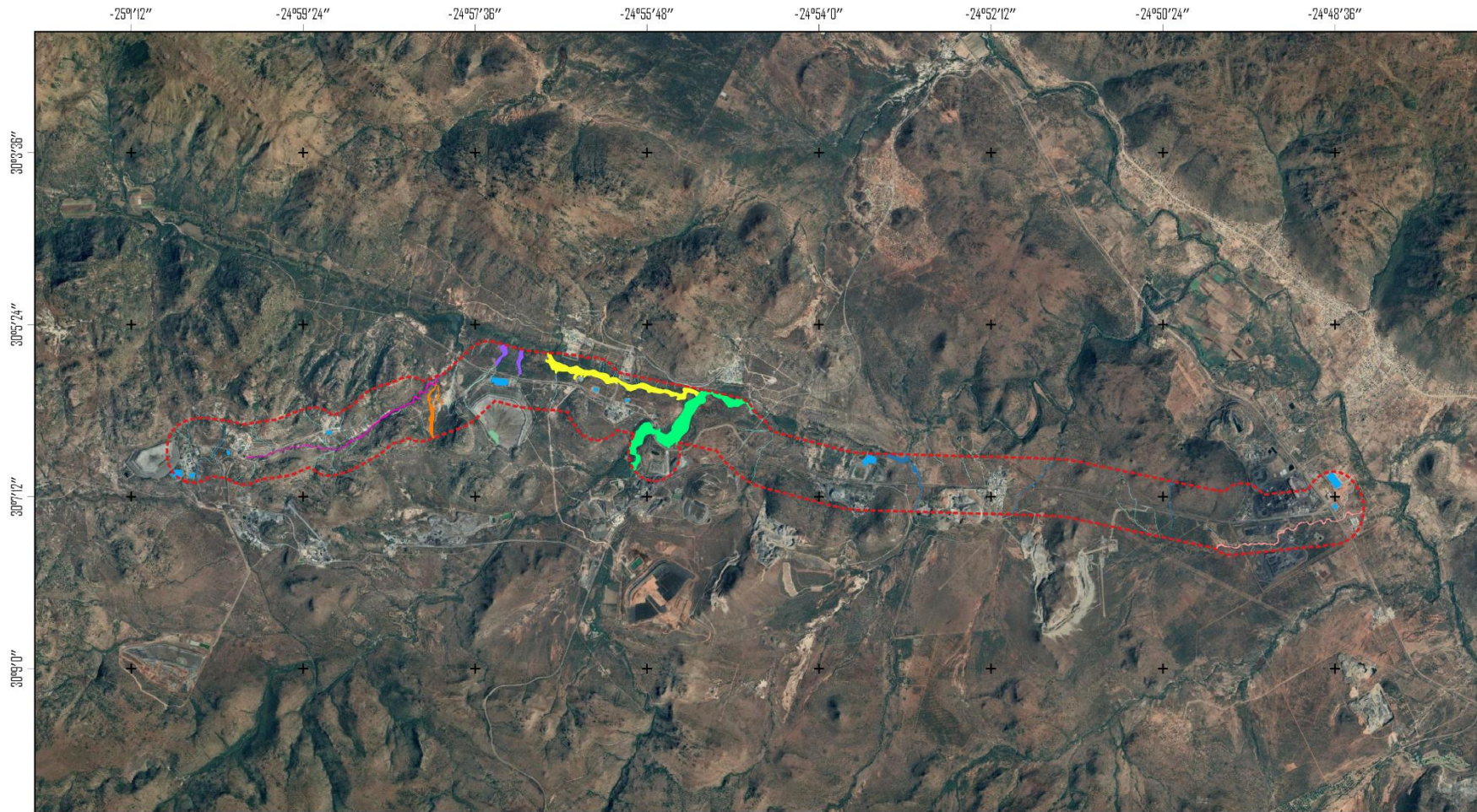
The soil for the channelled valley bottom systems is typically characterised by vertic black clays which do not display typical wetland indicators and provide some difficulty in accurately delineating the outer edge of the wetlands. The presence facultative wetland vegetation species suggests a temporary saturation period. It is apparent that surface run-off is the primary driver for these systems. The unchannelled systems do not differ greatly from the channelled systems but represent systems where the flow velocities and volumes are not sufficient to create a channel within the system. The presence of drainage features and ephemeral watercourses do not display wetland characteristics and cannot be delineated as wetlands.

7.6.1 Wetland unit identification

The wetland classification as per SANBI guidelines is presented in Table 7:2. Two (2) wetland types were identified within the 500 m regulated area, namely channelled and unchannelled valley bottom wetlands.

Table 7:2 Wetland classification as per SANBI guideline (TBC, 2021)

Wetland system	Level 1	Level 2		Level 3	Level 4		
	System	DWS Ecoregion/s	NFEPA Wet Veg Group/s	Landscape Unit	4A (HGM)	4B	4C
HGM 1 & 3	Inland	Eastern Bankenveld	Central Bushveld Group 1	Valley Floor	Unchannelled Valley Bottom	N/A	N/A
HGM 2	Inland	Eastern Bankenveld	Central Bushveld Group 1	Valley Floor	Channelled Valley Bottom	N/A	N/A



Legend		
	500 m Regulated Area Delineation	
	Artificial Dams	
	Drainage Features	
	Ephemeral Watercourse	
	HGM 1- UVB	
	HGM 2- CVB	
	HGM 3- UVB	

Project: LWUA Spitskop to Mototolo Pipeline
 Date: 04/08/2021
 Datum: WGS 84
 Compiler: A Husted


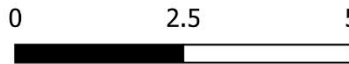




Figure 7:4: Delineated wetlands for the SE2 project (TBC, 2021)

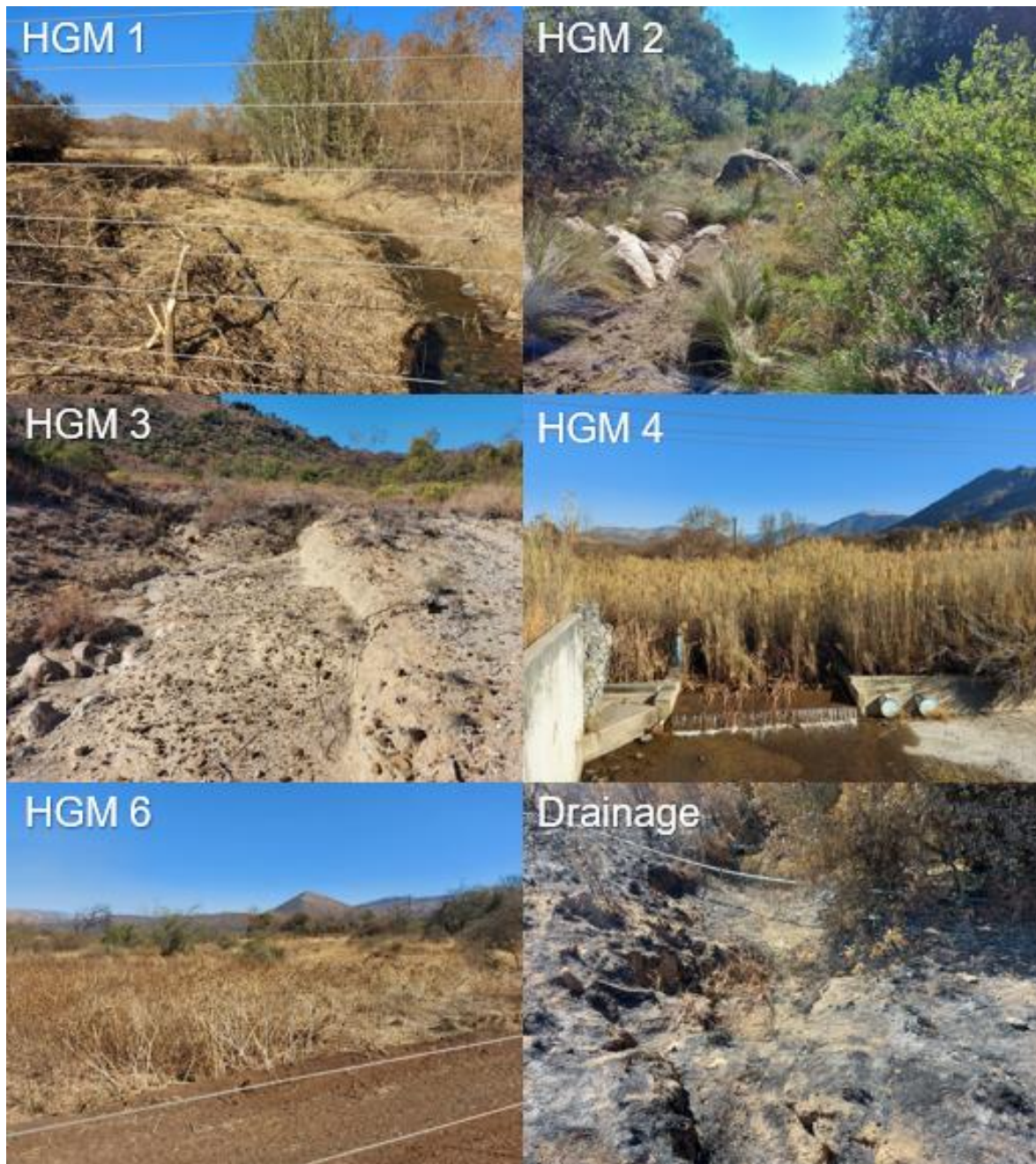


Figure 7:5: Photographs of systems identified

7.6.2 Hydromorphic soils

Soils are the most important characteristic of wetlands in order to accurately identify and delineate wetland areas. Two dominant soil forms were identified within the identified wetlands (TBC, 2021):

- Dundee soil forms; and
- Rensburg soil forms

The Dundee soil form consists of an Orthic topsoil on top of a stratified alluvium horizon. The soil family group identified for the Dundee soil form is “2222” due to the chromic colour of the topsoil, the brown colour of the subsoil, the non-calcareous nature of the soil form as well as the presence of alluvial wetness.

Orthic topsoils are mineral horizons that have been exposed to biological activities and varying intensities of mineral weathering. The climatic conditions and parent material ensure a wide range of properties differing from one orthic topsoil to another (i.e. colouration, structure etc) (Soil Classification Working Group, 2018).

The stratified alluvium horizon is formed via alluvial or colluvial processes. This soil type is stratified and closely resembles the parent material of this soil type. Stratified alluvium generally is fertile and is often therefore used for cultivation purposes.

The Rensburg soil form consists of a vertic topsoil on top of a gley horizon. The soil family group identified for the Rensburg soil form on-site has been classified as the “1000” soil family due to the non-calcareous nature of the gley horizon.

Vertic topsoils have high clay content with smectic clay particles being dominant (Soil Classification Working Group, 2018). The smectic clays have swell and shrink properties during wet and dry periods respectively. Peds will be shiny, well-developed with a highly plastic consistency during wet periods as a result of the dominance of smectic clays. During shrinking periods, cracks form on the surface and rarely occurs in shallow vertic clays.

Gley horizons that are well developed and have homogenous dark to light grey colours with smooth transitions. Stagnant and reduced water over long periods is the main factor responsible for the formation of a Gley horizon and could be characterised by green or blue tinges due to the presence of a mineral called Fougerite which includes sulphate and carbonate complexes. Even though grey colours are dominant, yellow and/or red striations can be noticed throughout a Gley horizon. The structure of a Gley horizon mostly is characterised as strong pedal, with low hydraulic conductivities and a clay texture, although sandy Gley horizons are known to occur. The Gley soil form commonly occurs at the toe of hillslopes (or benches) where lateral water inputs (sub-surface) are dominant and the underlying geology is characterised by a low hydraulic conductivity. The Gley horizon usually is second in diagnostic sequence in shallow profiles yet is known to be lower down in sequence and at greater depths (Soil Classification Working Group, 2018).

7.6.3 Ecological Functional Assessment

The ecosystem services provided by the wetland units identified on site were assessed and rated using the WET-EcoServices method. The summarised results are shown in Table 7:3. Overall, HGMs 1 and 2 scored “Intermediate” while HGM 3 scored “Moderately Low” in terms of their wetland ecosystem services. All three wetlands are considered relatively important for regulating and supporting benefits such as flood attenuation and water quality enhancement. The most benefits are associated with HGM 1. Due to the location of the units in relation to the land uses and planned developments, all three wetlands are considered important from biodiversity maintenance perspective.

All of the wetlands are considered moderately (low) important in terms of their direct provisioning of harvestable resources and cultivated foods for humans as the area is predominantly associated with mining. None of the wetlands are considered very important from cultural, tourism and recreation perspective.

Table 7:3 Ecosystem services provided by the HGM units identified (TBC, 2021)

Wetland Unit			HGM 1	HGM 2	HGM 3	
Ecosystem Services Supplied by Wetlands	Indirect Benefits	Regulating and supporting benefits	Flood attenuation	2.2	1.8	1.4
			Streamflow regulation	2.6	2.0	1.5
		Water Quality enhancement benefits	Sediment trapping	2.5	2.2	1.3
			Phosphate assimilation	2.6	2.3	1.2
			Nitrate assimilation	2.7	2.3	1.2
			Toxicant assimilation	2.6	2.2	1.1

Wetland Unit				HGM 1	HGM 2	HGM 3	
Direct Benefits			Erosion control	2.5	2.3	1.3	
			Carbon storage	1.6	1.1	1.0	
	Provisioning benefits	Biodiversity maintenance			2.4	2.1	1.5
		Provisioning of water for human use			1.4	1.2	0.8
		Provisioning of harvestable resources			1.2	1.1	0.7
		Provisioning of cultivated foods			1.1	1.0	0.6
		Cultural heritage			0.3	0.3	0.3
		Tourism and recreation			1.3	1.1	1.0
		Education and research			1.2	0.9	0.8
	Average Eco Services Score			1.9	1.6	1.0	

7.6.4 Present Ecological State

The Present Ecological State (PES) for the assessed HGM types is presented in Table 7:4 and shown in Figure 7:6. Due to the local land uses and anthropogenic activities no pristine or natural wetlands were encountered for the project. Mining and infrastructure development have impacted on the wetlands by means of altered hydro-dynamics and impaired water quality and in direct modification by means of encroaching into (or across) wetlands.

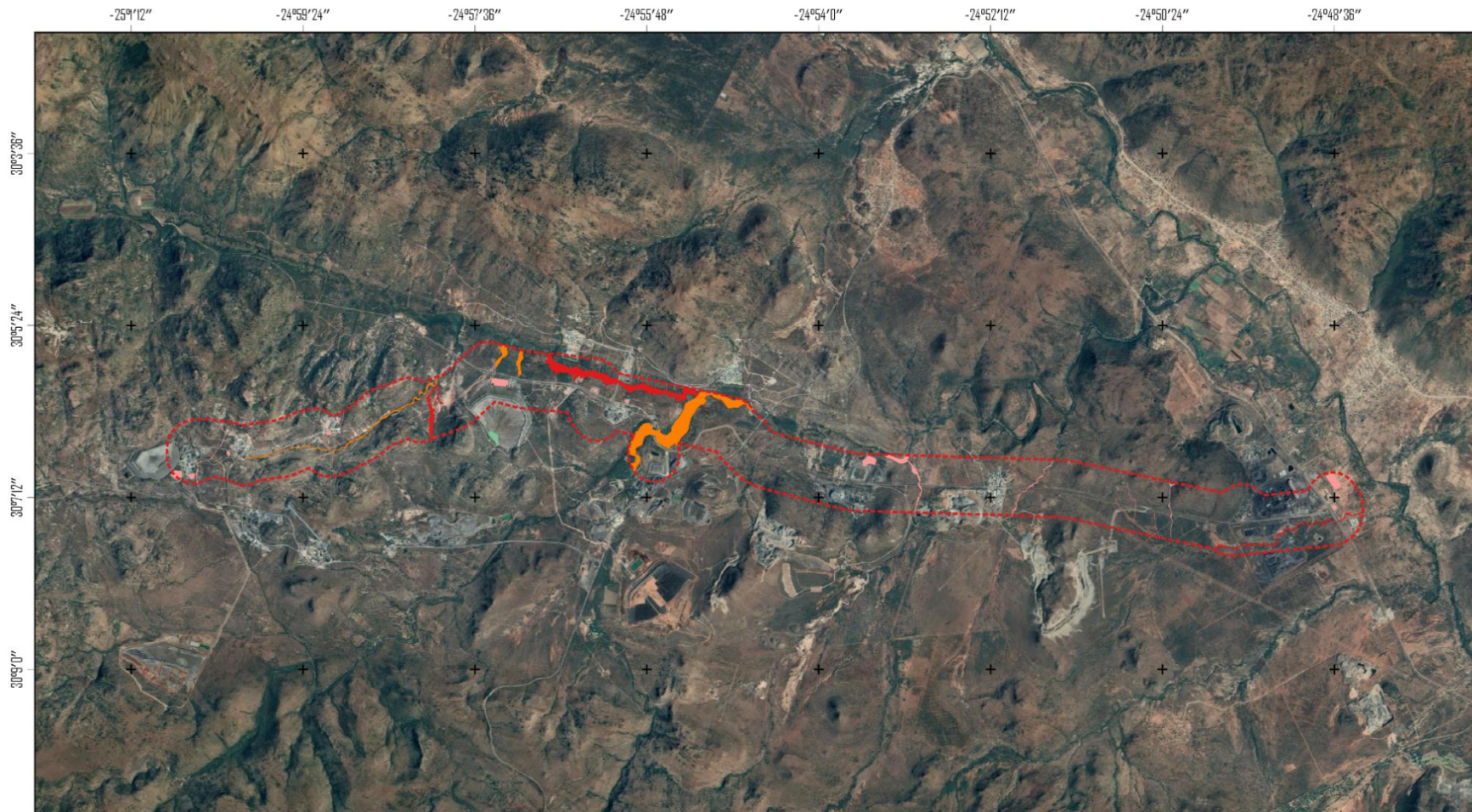
The overall PES for HGM 1 and HGM 2 has been determined to be “Largely Modified” which indicates a large change in ecosystem processes and loss of natural habitat and biota has occurred. The ecological classification for HGM 3 was determined to be “Seriously Modified”.

This assessment identified numerous aspects which have contributed to the altered state of the wetlands. The dominant land uses identified for the project area contributing to the altered integrity of the wetlands includes access route development, stormwater networks, linear infrastructure and expanding mining operations. The changes to the catchment area are reflected in the modified statuses of the wetland systems. These changes have resulted in some level of degradation of wetland habitats, typically through:

- Erosion of preferred flow channels and the formation of drainage channels. There is evidence of scouring and head cut erosion;
- Altered surface flow dynamics caused by the changes in land use and the development of the catchment area. This has resulted in increased flow velocities and volumes flowing through the systems;
- Flows through systems have also been obstructed by the development of crossing infrastructure; and
- The establishment of alien vegetation in these areas.

Table 7:4 Summary of the scores for the delineated wetlands’ PES


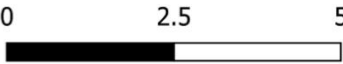
HGM Unit	Hydrology		Geomorphology		Vegetation		Overall PES	
	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score
HGM 1	5.0 (D)	Remain Stable	4.7 (D)	Remain Stable	2.6 (C)	Slowly Deteriorate	4.2 (D)	Slowly Deteriorate
HGM 1	5.0 (D)	Remain Stable	5.2 (D)	Remain Stable	2.7 (C)	Slowly Deteriorate	4.4 (D)	Slowly Deteriorate
HGM 3	7.0 (E)	Slowly Deteriorate	6.3 (E)	Slowly Deteriorate	4.5 (D)	Slowly Deteriorate	6.1 (E)	Slowly Deteriorate



Legend

- 500 m Regulated Area
- PES
- D
- E
- N/A

Project: LWUA Spitskop to Mototolo Pipeline
 Date: 04/08/2021
 Datum: WGS 84
 Compiler: A Husted

Limpopo Province Context



Figure 7:6 The Present Ecological State of the delineated wetland systems (TBC, 2021)

7.6.5 Ecological Importance and Sensitivity assessment

The results of the Ecological Importance and Sensitivity (EI&S) assessment are shown in Table 7:5. Various components pertaining to the protection status of a wetland is considered for the EI&S, including Strategic Water Source Areas (SWSA), the National Freshwater Ecosystem Priority Areas (NFEPA) wet veg protection status and the protection status of the wetland itself considering the NBA wetland data set. At a regional scale the NFEPA Wetveg database recognises valley bottom wetland types within the Central Bushveld Group 1 as Critically Endangered and Poorly Protected (Nel and Driver, 2012). The EI&S for both wetland types has been calculated to be “High”, which considers the Critically Endangered (CR) threat status for these systems.

Table 7:5 Ecological Importance and Sensitivity assessment (TBC, 2021)

HGM Type	Wet Veg			NBA Wetlands		SWSA (Y/N)	Calculated EI&S
	Type	Ecosystem Threat Status	Ecosystem Protection Level	Wetland Condition	Ecosystem Threat Status 2018		
HGM 1 & 3	Central Bushveld Group 1	LC / CR	PP	D/E Largely/Seriously Modified	CR	N	High
HGM 2	Central Bushveld Group 1	LC EN	PP	D/E Largely/Seriously Modified	CR	N	High

7.6.6 Buffer requirements

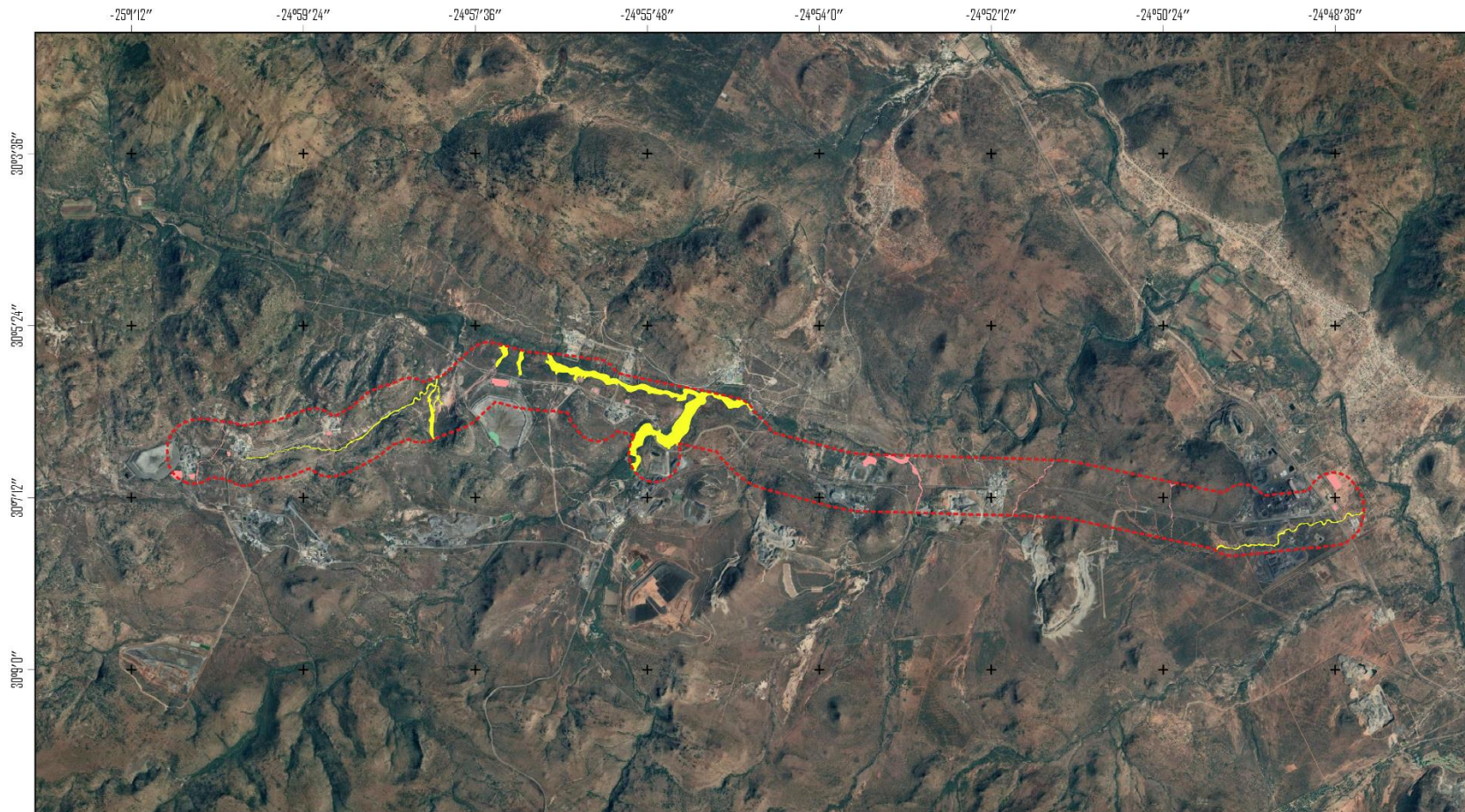
Water Use License Application in terms of the National Water Act (Act No. 36 of 1998) (NWA). Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the NWA. In accordance with GN 509, a regulated area of a watercourse in terms of water uses as listed in Section 21 (c) and (i) is defined as:

- the outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
- in the absence of a determined 1 in 100 year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or
- a 500 m radius from the delineated boundary (extent) of any wetland or pan in terms of this regulation.

It is worth noting that the scientific buffer calculation (Macfarlane *et al.*, 2014) was used to determine the size of the buffer zones relevant to the pipeline. The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane *et al.*, 2014) determined a pre-mitigation buffer zone of 30 m is recommended for the identified wetland, which can be decreased to 15 m with the addition of all prescribed mitigation measures (see Table 7:6). A 100 m buffer width should be assigned the drainage features in accordance with the NWA, 1998 (Act No. 36 of 1998).

Table 7:6 Pre-and post-mitigation buffer sizes


Phase	Buffer Widths
Pre-mitigation buffer	30 m
Post-mitigation buffer	15 m




Legend

- 500 m Regulated Area
- EIS
- B
- N/A

Project: LWUA Spitskop to Mototolo Pipeline
 Date: 04/08/2021
 Datum: WGS 84
 Compiler: A Husted



0 2.5 5 km



Limpopo Province Context




Figure 7:7 Ecological Importance and Sensitivity of the delineated wetland systems (TBC, 2021)

7.7 Air quality

Main sources of air pollution in the area where the proposed pipeline will be constructed include:

- Agriculture:
 - Particulates associated with wind and erosion, chemicals associated with crop spraying, and odiferous emissions resulting from manure, fertilizer and crop residue;
- Biomass burning:
 - Burning of crop residue, and veld fires (controlled and uncontrolled);
- Vehicle tailpipe emissions:
 - Atmospheric pollutants emitted from motor vehicles include hydrocarbons, CO, NO_x, SO₂ and particulates;
- Wind-blown dust:
 - Wind erosion of exposed, open areas;
- Small industries:
 - Gasses such as CO₂, CO, NO_x and SO₂ be discharged;
- Mining:
 - Fugitive dust generated by open pit mining and tailings storage facilities in proximity of the proposed SE2 pipeline project area;

7.8 Noise

No noise and vibration investigation were undertaken for the proposed SE2 pipeline project as the pipeline will be buried within the existing SE1 pipeline servitude and the only expected noise pollutant will be temporarily during the construction phase of the pipeline development.

7.9 Visual

No visual impact assessment was undertaken for the proposed SE2 pipeline project as the pipeline will be buried within the existing SE1 pipeline servitude and as such the only visual impact anticipation is temporarily during the construction phase of the development of the pipeline.

7.10 Heritage and palaeontology

Information on heritage and palaeontology were obtained from Beyond Heritage's heritage report for the proposed SE2 project, August 2021 (Appendix D2).

Previous disturbances relating to existing mining operations and pipeline are evident along the route and would have destroyed surface evidence of heritage sites within the existing servitude. Three burial sites (LWUA 1 – LWUA 3) and possible ephemeral Iron Age stone packed terrace site (LWUA 4) were recorded. These sites are all located outside of the pipeline servitude and will not be directly impacted on. The spatial data for the sites are presented in Table 7:7 and illustrated in Figure 7:9. Burial sites and cemeteries are of high social significance and the recorded sites consists of formal graves with headstones as well as a palisaded cemetery (Figure 7:8). At the Iron Age site, the ephemeral stone packed features have already been disturbed by the existing pipelines and little remains of the site (Figure 7:8).

Table 7:7 Heritage resources recorded during the survey (Beyond Heritage, 2021)

Label	Longitude	Latitude	Description	Heritage significance
LWUA 1	30° 07' 19.4124" E	24° 50' 23.1360" S	2 graves	High Social Significance GP A
LWUA 2	30° 07' 05.5812" E	24° 51' 23.1085" S	Cemetery	High Social Significance GP A
LWUA 3	30° 06' 48.6935" E	24° 54' 32.6772" S	Cemetery	High Social Significance GP A
LWUA 4	30° 06' 33.3215" E	24° 58' 49.4003" S	Possible ephemeral stone packed terraces	Low Significance GP C

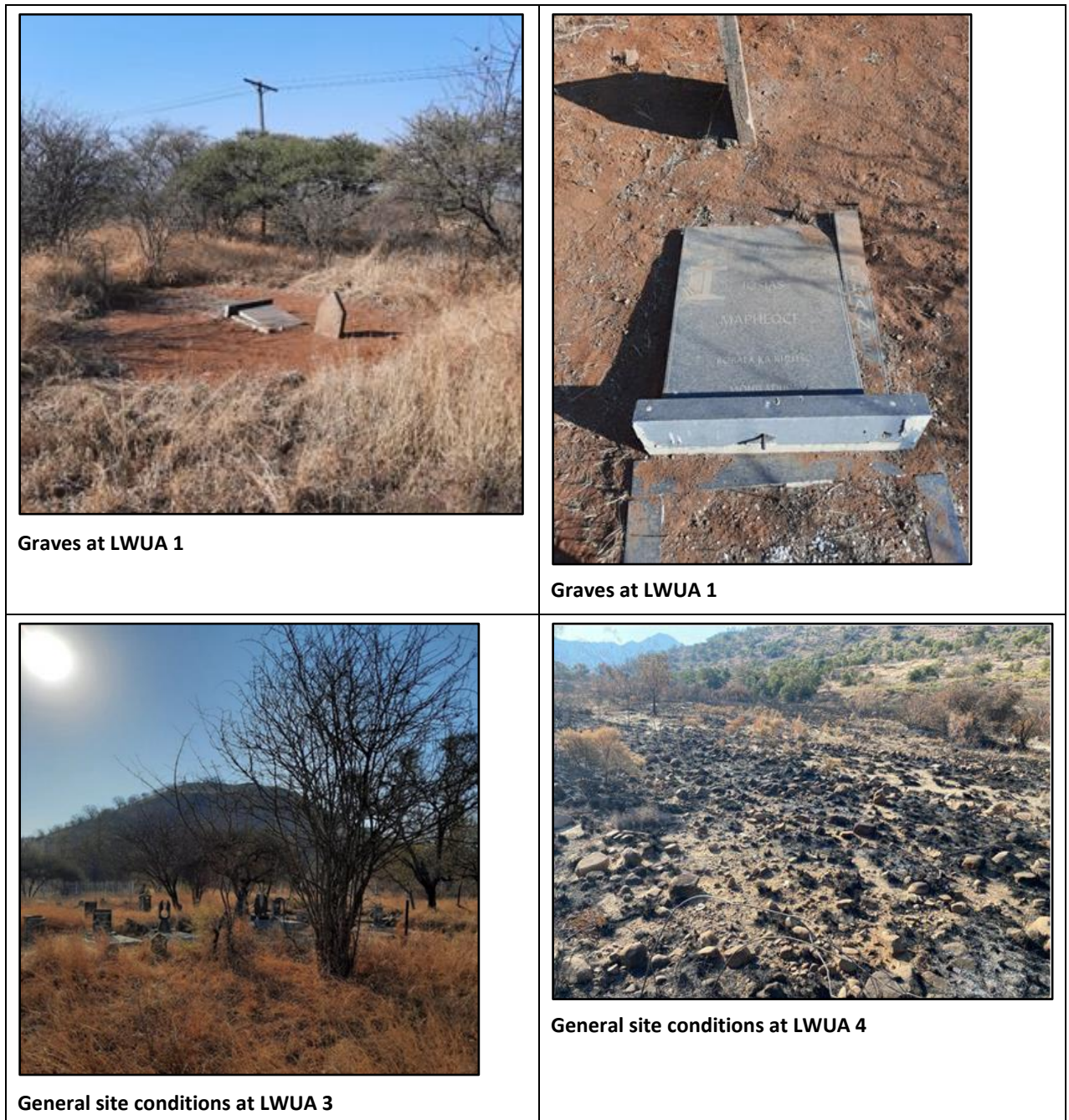


Figure 7:8 Photographs of identified heritage sites (Beyond Heritage, 2021)

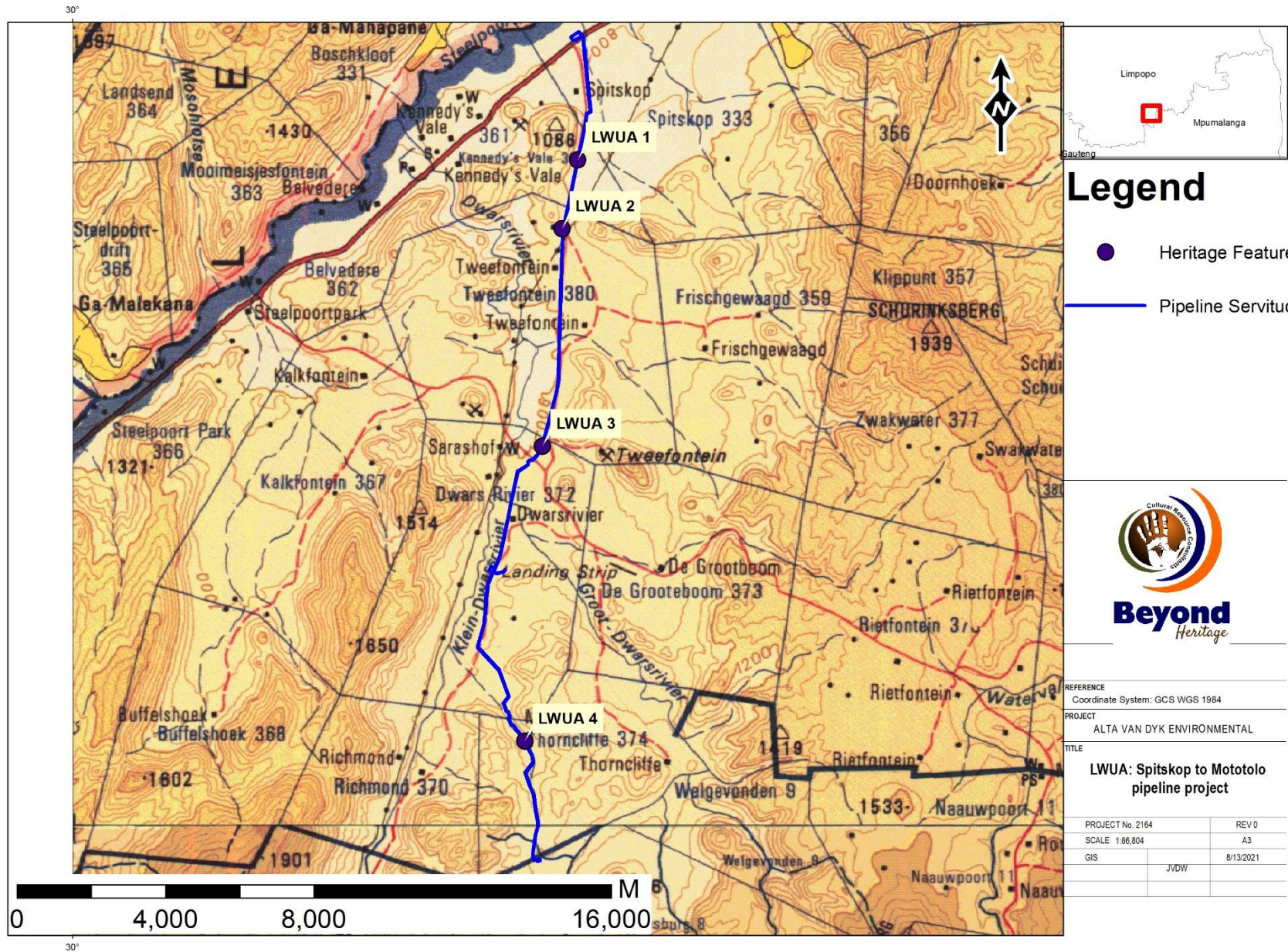


Figure 7:9 Distribution of recorded heritage features (Beyond Heritage, 2021)

7.11 Palaeontology

According to the SAHRA Paleontological map the paleontological sensitivity of the study area is low, and no further studies are required (Beyond Heritage, 2021).

7.12 Social

As stated previously, the proposed project is located in the Fetakgomo Tubatse Local Municipality, which is located north of N4 highway, Middleburg, Belfast and Mbombela; and east of the N1 highway; Groblersdal and Polokwane. The municipal area of jurisdiction covers approximately 4550 km². The area is known as the middelveld as it is located between the Highveld and Lowveld regions. It is located within the Sekhukhune District Municipality of the Limpopo Province (FTLM, 2021).

The municipality comprises approximately 342 villages. The municipality is largely dominated by rural landscape with only 6 (six) proclaimed townships. Like most rural municipalities in the Republic of South Africa, Fetakgomo Tubatse Local Municipality is characterised by weak economic base, inadequate infrastructure, major service backlogs, dispersed human settlements and high poverty levels. This led to description of various municipal categorisation, for example, in its 'State of Local Government in South Africa: Overview Report, the Department of Cooperative Governance (CoG) (2009:22) describes category B4 municipalities as those municipalities which are mainly rural, located in economically depressed areas, consequently having difficulties in attracting and retaining skilled managers/professionals and are struggling from a revenue generation perspective. As earlier alluded to, the portions the rural heritage of the municipality in terms of which settlements are far apart makes the provision and maintenance of services very costly and/or exorbitant. Some of these areas are too small to attain the economic threshold required to provide social facilities in a cost-effective manner (FTLM, 2021).

7.12.1 Demographic parameters

According to the 2011 Stats SA information; the total population of the Fetakgomo Tubatse Local Municipality is approximately 429 471 with 106 050 households; these make Fetakgomo Tubatse Local Municipality a municipality with highest population in the district. The 2016 Community Survey as compared to the 2011 Stats SA results indicates that the Fetakgomo Tubatse Local Municipality's population increases to 489 902 (12%) with household increase to 125 454.

7.12.2 Free basic water

Fetakgomo Tubatse Municipality is neither a Water Services Authority nor a Water Service Provider. These functions were assigned to the Sekhukhune District Municipality. The district municipality is responsible for provision of Free Basic Water to the 39 wards of the municipality. Fetakgomo Tubatse Municipality is a water stressed municipality. According to community survey 2016 records that 58 255 have access to piped water and at 67 208 have no access to piped water. Water shortage is the main challenge in all the villages or 39 wards. The main causes of water shortage or deficit is the insufficient sources of water (FTLM, 2021).

7.12.3 Sanitation

Sanitation services is a function of the Sekhukhune District Municipality. Fetakgomo Tubatse Municipality has a huge backlog in sanitation provision. Generally, sanitation facilities in some villages are in a poor state hence the Sekhukhune District Municipality is currently constructing VIP toilets in most villages of the municipality (FTLM, 2021).

7.12.4 Electricity

Fetakgomo Tubatse Local Municipality is not the electricity Authority nor Provider and this is the sole competency of ESKOM. The municipality is only responsible for the coordination of the service by making sure that communities are consulted and by compiling a priority list. The only provider of electricity in the region is ESKOM; which has installed basic infrastructure to provide electricity to the communities. For most part, the rural population has no electricity. Lack of access to electricity to some villages poses a problem to the municipality as it impacts negatively on local economic development and community projects. Plans are underway for the municipality to start positioning itself and applying for electricity authority during the financial year under review (FTLM, 2021).

8 ENVIRONMENTAL IMPACT ASSESSMENT

8.1 Methodology to be used

The significance of the identified impacts will be determined using an accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998. As with all impact methodologies, the impact is defined in a semi-quantitative way and will be assessed according to methodology prescribed in the following section.

Table 8:1 Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of negative impact (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
DURATION	<p>5 - Permanent</p> <p>4 - Long term: Impact ceases after operational phase/life of the activity > 60 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 60 years.</p> <p>2 - Short term: Impact might occur during the construction phase - < 3 years.</p> <p>1 - Immediate</p>
EXTENT (or spatial scale/influence of impact)	<p>5 - International: Beyond National boundaries.</p> <p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p> <p>0 - None</p>

Evaluation Component	Rating Scale and Description/criteria
IRREPLACEABLE loss of resources	5 – Definite loss of irreplaceable resources. 4 – High potential for loss of irreplaceable resources. 3 – Moderate potential for loss of irreplaceable resources. 2 – Low potential for loss of irreplaceable resources. 1 – Very low potential for loss of irreplaceable resources. 0 - None
REVERSIBILITY of impact	5 – Impact cannot be reversed. 4 – Low potential that impact might be reversed. 3 – Moderate potential that impact might be reversed. 2 – High potential that impact might be reversed. 1 – Impact will be reversible. 0 – No impact.
PROBABILITY (of occurrence)	5 - Definite: >95% chance of the potential impact occurring. 4 - High probability: 75% - 95% chance of the potential impact occurring. 3 - Medium probability: 25% - 75% chance of the potential impact occurring 2 - Low probability: 5% - 25% chance of the potential impact occurring. 1 - Improbable: <5% chance of the potential impact occurring.
Evaluation Component	Rating Scale and Description/criteria
CUMULATIVE impacts	High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern. Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern. Low: The activity is localised and might have a negligible cumulative impact. None: No cumulative impact on the environment.

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 8:2 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 8:2 Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.

Significance Score	Environmental Significance	Description/criteria
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project

8.2 Identified impacts

Most of the potential impacts identified for this project will take place during the construction phase of the project. The construction phase is expected to last approximately 18 months and therefore most of the impacts associated with this project is temporary in nature. As the proposed infrastructure will be permanent features, impacts during closure have not been assessed as part of the basic assessment process, and closure cost have not been calculated for this project.

Several potential impacts are associated with the construction activities for this project. These impacts can be categorised as general construction related impacts as well as construction impacts specifically related to this site. General best practice rules to construction should be followed at all times. In addition to this, specific mitigation measures and recommendations are included to avoid or minimise the potential impacts identified. Potential impacts identified during the construction phase of the project is assessed in Table 8:3.

During the operational phase, potential impacts identified are associated with maintenance activities, and impacts are generally low even before the implementation of mitigation measures. Impacts identified relate mostly to watercourse crossings where the pipeline could potentially run above ground. It is important to ensure that the pipeline is well-maintained in order to ensure water provision to the receivers. Potential impacts identified during the operational phase of the project is assessed in Table 8:4.

Table 8:3 Identified impacts during the construction phase of the proposed SE2 pipeline and associated infrastructure

IDENTIFIED IMPACTS DURING THE CONSTRUCTION PHASE OF THE SE2 PIPELINE												
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE							CUMULATIVE	STATUS	RECOMMENDED MITIGATION MEASURE	
		MAGNITUDE	DURATION	EXTENT	IRREPLACEABILITY	REVERSIBILITY	PROBABILITY	TOTAL				SIGNIFICANCE
Soils												
Loss of soils to compaction and erosion	Site clearing and preparation Trench excavation and installation of pipeline Construction of reservoir	Before mitigation							Low	Negative	Stockpile the topsoil and sub-soil separately on either side of the trench and backfill in the correct order. All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. The amount of stockpiling of surplus soil material must be limited as far as practically possible, to avoid unnecessary handling of soil resources. Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. These designated stockpile areas must be viewed as temporary and kept for backfill material. Maintain soil quality and minimise damage to the soil structure during the time the material is stockpiled. All construction access must make use of the existing roads that can be found in and around the project area. Compacted areas are to be ripped to loosen the soil structure where necessary. Implement appropriate stormwater management measures, including the temporary diversion of upstream run-off from the construction and laydown areas. A rehabilitation strategy focused on revegetation must be initiated after the construction phase. Ensure topsoil is spread back over trench area on closure of the trench. It is preferred that the trench is created on a needs basis to avoid an excessive excavation. As pipe is laid, the trench must be backfilled and topsoil replaced. Landscape and lightly till (no deeper than 30 cm) denuded areas to encourage vegetation establishment as soon as possible.	
		6	4	2	3	3	4	72				M
		After mitigation										
		4	2	1	2	1	2	20	L			
Contamination of soils due to spilled concrete or hydrocarbons	Trench excavation and installation of pipeline Construction of reservoir	Before mitigation							Low	Negative	All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site. 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. Any fuel, oil or hazardous substance spills must be cleaned-up immediately and discarded correctly. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.	
		6	4	2	3	3	4	72				M
		After mitigation										
		4	2	1	2	1	2	20	L			
Biodiversity – Fauna and Flora												
Destruction, fragmentation and degradation of habitats	Vegetation clearing and site preparation	Before mitigation							Low	Negative	Demarcate the footprint area with high visibility plastic fencing. Restrict the disturbance footprint to within the designated pipeline route. Reduce the disturbance footprint and the unnecessary clearing of vegetation on either side of the trench as far as possible.	
		6	5	4	3	3	3	63				M
		After mitigation										
		2	2	2	1	1	1	8	L			
Loss of protected plant and tree species	Vegetation clearing and site preparation	Before mitigation							Low	Negative	Prior to the construction phase, a suitably qualified botanist should undertake a walkdown of the SE2 pipeline route and identify all protected plants and confirm presence of Species of Conservation Concern. Any individual of the nationally protected trees or protected plants that were observed needs a relocation or destruction permit that will be required for any individual that may be removed or destroyed due to the development, alternatively the trees/plants can be relocated within the property without a permit or otherwise left unharmed. High visibility flags must be placed near any protected trees/plants.	
		6	5	4	3	3	3	63				M
		After mitigation										
		4	2	2	2	2	1	12	L			

IDENTIFIED IMPACTS DURING THE CONSTRUCTION PHASE OF THE SE2 PIPELINE												
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE							CUMULATIVE	STATUS	RECOMMENDED MITIGATION MEASURE	
		MAGNITUDE	DURATION	EXTENT	IRREPLACEABILITY	REVERSIBILITY	PROBABILITY	TOTAL				SIGNIFICANCE
Spread and/or establishment of alien and/or invasive species	Vegetation clearing and site preparation Trench excavation and installation of pipeline Construction of reservoir	Before mitigation							Low	Negative	Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. Compilation of and implementation of an alien vegetation management plan. A pest control plan must be put in place and implemented; it is imperative that poisons not be used. Opt for manual removal.	
		4	4	2	2	1	3	39				L
		After mitigation										
		2	2	1	1	1	1	7	L			
Introduction of nuisance vectors (pests) such as flies, rodents and baboons	Vegetation clearing and site preparation Trench excavation and installation of pipeline Construction of reservoir	Before mitigation							Low	Negative	Ensure the correct handling, storage and operation of general waste generated on the construction site. Remove general waste generated frequently as to prevent the development of a breeding habitat for nuisance pests such as flies, and attracting rodents and baboons.	
		4	2	2	2	2	2	24				L
		After mitigation										
		2	2	1	1	1	1	7	L			
Surface water and wetlands												
Direct loss, disturbance and degradation of wetlands.	Vegetation clearing and site preparation Trench excavation and installation of pipeline	Before mitigation							Low	Negative	Restrict all construction related activities to within the designated pipeline route. Use wetland spatial data (shapefiles) to mark out the positions where the pipeline will enter and exit the 15 m buffer on the boundary of a wetland. Indicate delineated wetlands on site layout plans. Adhere to the prescribed wetland buffers for secondary activities. Restrict all secondary activities (e.g. laydown yards, storage areas, cement mixing and equipment to outside of wetlands and their prescribed buffers. Signpost the area beyond the construction footprint where the pipeline traverses the wetlands as an environmentally sensitive area and keep all excavation, soil stockpiling, general access and construction activities out of this area. Demarcate the 15 m buffer zone around wetlands on the ground (e.g. painted wooden poles/high visibility plastic fencing). Reduce the disturbance footprint and the unnecessary clearing of vegetation on either side of the trench as far as possible when traversing wetlands. Consider above ground crossings over wetland areas. Alternatively, open trench crossings are permissible but backfilling and rehabilitation must be undertaken. Load wetland spatial data onto a GPS and use it to mark out the positions where the pipeline will enter and exits the prescribed buffer on the boundary of a wetland. Try to reduce the disturbance footprint and the unnecessary clearing of vegetation on either side of the trench as far as possible when traversing wetlands. Construct the wetland crossings during winter, if possible, when flow volumes are lowest. This will reduce impacts to wetlands due to soil poaching/sourcing and vegetation trampling under peak saturation levels. Additionally, the risk of vehicles getting stuck and further degrading the vegetation integrity is lowest during this time.	
		6	4	2	3	3	3	54				M
		After mitigation										
		4	2	2	2	2	2	24	L			
Increased bare surfaces, runoff and potential for erosion and resulting	Vegetation clearing and site preparation	Before mitigation							Low	Negative	Keep the trench excavation neat and tidy. Separate sub-soil and topsoil on either side of the trench. Limit construction activities across the wetlands to the dry season, if possible, when storms are least likely to wash concrete and sand into wetlands.	
		6	4	2	3	3	3	54				M
		After mitigation										

IDENTIFIED IMPACTS DURING THE CONSTRUCTION PHASE OF THE SE2 PIPELINE												
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE							CUMULATIVE	STATUS	RECOMMENDED MITIGATION MEASURE	
		MAGNITUDE	DURATION	EXTENT	IRREPLACEABILITY	REVERSIBILITY	PROBABILITY	TOTAL				SIGNIFICANCE
sedimentation of the wetlands		4	2	2	2	2	2	24	L		<p>Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.</p> <p>Mixing of concrete must under no circumstances take place in any wetland or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished.</p> <p>Do not situate any of the construction material laydown areas within any wetland or buffer areas.</p> <p>No machinery/equipment should be allowed to be parked in any wetlands or buffer zone areas</p> <p>Ensure topsoil is spread back over trench area on closure of the trench. It is preferred that the trench is created on a needs basis to avoid an excessive excavation. As pipe is laid, the trench must be backfilled and topsoil replaced.</p> <p>Landscape and lightly till (no deeper than 30 cm) denuded areas to encourage vegetation establishment as soon as possible.</p>	
Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Vegetation clearing and site preparation	Before mitigation							Low	Negative	<p>Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed.</p> <p>The use of herbicides is not recommended in or near wetlands (opt for mechanical removal).</p> <p>Appropriately stockpile topsoil cleared from the project area. This can be used for rehabilitation of the servitude.</p> <p>Clearly demarcate construction footprint, and limit all activities to within this area.</p> <p>Minimize unnecessary clearing of vegetation.</p> <p>All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping".</p> <p>Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation).</p> <p>No dumping of construction material on site may take place within the wetland or buffer area. All material must be contained in waste skips and removed to designated (and licensed) facilities.</p> <p>All waste generated on site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.</p> <p>Landscape and re-vegetate all denuded areas as soon as possible.</p>	
		6	4	2	3	3	3	54				M
		After mitigation										
		4	2	2	2	2	2	24	L			
Increased sediment loads to downstream reaches	Vegetation clearing and site preparation Trench excavation and installation of pipeline	Before mitigation							Low	Negative	<p>Implement mitigation for increased bare surfaces, runoff and potential for erosion.</p> <p>Re-instate topsoil and lightly till disturbance footprint.</p> <p>At all crossings install sandbags on downstream side of the footprint to trap sediment until the site has been constructed and vegetation has re-established.</p>	
		6	4	2	3	3	3	54				M
		After mitigation										
		4	2	2	3	2	2	26	L			
Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Vegetation clearing and site preparation Trench excavation and installation of pipeline	Before mitigation							Low	Negative	<p>Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.</p> <p>Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering the wetland areas.</p> <p>Mixing of concrete must under no circumstances take place within the wetland or buffer areas.</p> <p>Regularly maintain stormwater infrastructure, pipes, pumps and machinery to minimise the potential for leaks. Check for oil leaks, keep a tidy operation, install bins and promptly clean up any spills or litter.</p> <p>Provide appropriate sanitation facilities during construction and service them regularly. These must be beyond the wetland and buffer area.</p> <p>Monitor and inspect machinery, vehicles and equipment for leaks and spills.</p>	
		6	4	2	3	3	3	54				M
		After mitigation										
		4	2	2	2	2	2	24	L			

IDENTIFIED IMPACTS DURING THE CONSTRUCTION PHASE OF THE SE2 PIPELINE												
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE							CUMULATIVE	STATUS	RECOMMENDED MITIGATION MEASURE	
		MAGNITUDE	DURATION	EXTENT	IRREPLACEABILITY	REVERSIBILITY	PROBABILITY	TOTAL				SIGNIFICANCE
Disruption of wetland soil profile and alteration of hydrological regime	Backfilling of trench	Before mitigation							Low	Negative	Document the soil profile on removal and check the order in which soil is replaced. Separate the topsoil (including seedbank) from the subsoil layer. Ensure that topsoil is appropriately stored and re-applied during trench backfilling. Ensure that the soil is backfilled and compacted to accepted geotechnical standards to avoid flow canalisation along the trench and the potential for sinkhole formation.	
		6	4	2	3	3	3	54				M
		After mitigation										
		4	2	2	2	2	2	24				L
Heritage												
Impact on graves and cemeteries found along SE2 pipeline route	Site clearing and preparation Trench excavation and installation of infrastructure	Before mitigation							Low	Negative	All recorded graves and burial sites should be indicated on development plans and avoided with a buffer of 30m. The graves and cemeteries must be accessible at all times during construction. Implement dust suppression around graves and cemeteries to minimise dust fallout on headstones. Implement the chance find procedure should an artefact or grave be uncovered during construction.	
		4	5	3	5	5	4	88				MH
		After mitigation										
		4	5	3	5	5	1	22				L
Impact of the ephemeral walling at LWUA 04	Site clearing and preparation Trench excavation and installation of infrastructure	Before mitigation							Low	Negative	Implement the chance find procedure should an artefact or grave be uncovered during construction.	
		4	5	2	5	5	2	42				M
		After mitigation										
		4	5	3	1	1	1	14				L
Noise												
General rise in ambient noise levels	Site clearing and preparation Trench excavation and installation of pipeline Construction of reservoir	Before mitigation							Low	Negative	Ensure high level of equipment maintenance, especially intake and exhaust mufflers. Replace pure tone (beeping) with broadband (hissing) reversing alarms. Construction activities to take place only during daylight hours.	
		6	2	2	2	2	4	56				M
		After mitigation										
		4	2	1	1	1	2	18				L
Air Quality												
Increased dust fallout around construction areas	Site clearing and preparation Trench excavation and installation of pipeline Construction of reservoir	Before mitigation							Low	Negative	Apply dust suppressants to gravel roads used. Set speed limits to 40 km/h to minimise the creation of fugitive dust within the project boundary. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, during the construction phase. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated.	
		6	2	2	2	2	4	56				M
		After mitigation										
		4	2	1	1	1	2	18				L
Social												
Benefits resulting from employment and income	Construction of SE2 pipeline and reservoir	Before mitigation							Low	Positive	Develop a clear and concise employment policy prioritising local employment Employ local works if qualified applicants with the appropriate skills are available.	
		4	2	2	2	2	2	24				L

IDENTIFIED IMPACTS DURING THE CONSTRUCTION PHASE OF THE SE2 PIPELINE												
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE							CUMULATIVE	STATUS	RECOMMENDED MITIGATION MEASURE	
		MAGNITUDE	DURATION	EXTENT	IRREPLACEABILITY	REVERSIBILITY	PROBABILITY	TOTAL				SIGNIFICANCE
opportunities created by the construction of the pipelines		After mitigation									Purchase goods and services at a local level if available.	
		4	2	2	2	2	2	24	L			
Influx of people and construction workers leading to increased pressure on social services and infrastructure, social pathologies and disruptions, resulting in spontaneous settlements	Construction of SE2 pipeline and reservoir	Before mitigation							Low	Negative	Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy. Identify and support community development programmes that address challenges raised by population influx and spontaneous settlement. Support local government capacity for integrated development planning. Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase. Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	
		6	3	3	2	3	3	51				M
		After mitigation										
		4	2	3	2	2	2	26	L			
Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities	Construction of SE2 pipeline and reservoir	Before mitigation							Low	Negative	Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy. Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices. Monitor and implement the Grievance Management Mechanism. Involve Local Ward Councillors and keep them informed about project developments, and included in all stakeholder engagement processes. Their involvement will assist with the successful development of relationships between the LWUA, the municipality and the communities.	
		6	3	3	2	3	3	51				M
		After mitigation										
		4	2	3	2	2	2	26	L			

Table 8:4 Identified impacts during the operational phase of the proposed SE2 pipeline and associated infrastructure

IDENTIFIED IMPACTS DURING THE OPERATIONAL PHASE OF THE SE2 PIPELINE												
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE							CUMULATIVE	STATUS	RECOMMENDED MITIGATION MEASURE	
		MAGNITUDE	DURATION	EXTENT	IRREPLACEABILITY	REVERSIBILITY	PROBABILITY	TOTAL				SIGNIFICANCE
Soils												
Disturbance to soils around watercourse crossings	General maintenance activities	Before mitigation							Low	Negative	All maintenance contractors must access watercourse crossings using existing roads that can be found in and around the project area. Compacted areas are to be ripped to loosen the soil structure where necessary. Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	
		6	4	2	3	3	3	54				M
		After mitigation										
		2	2	1	1	1	1	7	L			
Contamination of soils due to spilled concrete or hydrocarbons	Encasing the pipeline caused by erosion at watercourse crossings	Before mitigation							Low	Negative	All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site. 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. Any fuel, oil or hazardous substance spills must be cleaned-up immediately and discarded correctly. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.	
		6	4	2	3	3	3	54				M
		After mitigation										
		2	2	1	1	1	1	7	L			
Biodiversity – Fauna and Flora												
Disturbance to local vegetation, leading to spread and/or establishment of alien and/or invasive species	General maintenance activities	Before mitigation							Low	Negative	Areas that are denuded during maintenance activities need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. Implementation of an alien vegetation management plan. Promptly remove all alien and invasive plant species observed during site inspections (i.e. weedy annuals and other alien forbs) must be removed. The use of herbicides is not recommended in or near wetlands (opt for mechanical removal).	
		6	4	1	2	2	3	45				M
		After mitigation										
		2	2	1	1	1	1	7	L			
Surface Water and Wetlands												
Disturbance to wetlands due to repair work undertaken at watercourse crossings	Repair to erosion protection structures at watercourse pipeline crossings	Before mitigation							Low	Negative	Repair to erosion protection structures should be done by hand. No vehicles should enter the watercourse areas. Undertake repair activities during winter, if possible. This will reduce impacts to wetlands due to soil poaching/sourcing and vegetation trampling under peak saturation levels. Additionally, the risk of vehicles getting stuck and further degrading the vegetation integrity is lowest during this time.	
		6	4	1	2	2	3	45				M
		After mitigation										
		2	2	1	1	1	1	7	L			
Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	General Maintenance activities	Before mitigation							Low	Negative	All sediment and debris removed from crossings must not be stored within wetland areas and buffer zones, or within other watercourses and must be deposited at an appropriate waste facility. Mixing of concrete must under no circumstances take place within the wetland or buffer areas Provide appropriate sanitation facilities during maintenance activities and service them regularly. These must be beyond the wetland and buffer area. Monitor and inspect machinery, vehicles and equipment for leaks and spills.	
		6	4	1	2	2	3	45				M
		After mitigation										
		2	2	1	1	1	1	7	L			
Increased raw water inputs to downstream wetlands	Operation of raw water pipeline Pipeline leak	Before mitigation							Low	Negative	Conduct regular inspections of manholes along both the pipeline routes and fix leaks timeously. Engineers should advise on the frequency of pressure tests to detect leaks. Monitor water quality at pump stations. Install leak detection devices.	
		4	4	2	2	2	2	28				L
		After mitigation										
		2	2	1	1	1	1	7	L			

Heritage												
No additional impacts are expected during the operational phase.												
Noise												
General rise in ambient noise levels	General maintenance activities	Before mitigation							Low	Negative	Ensure high level of equipment maintenance, especially intake and exhaust mufflers. Replace pure tone (beeping) with broadband (hissing) reversing alarms. Maintenance activities to take place only during daylight hours.	
		4	2	2	2	2	2	24				L
		After mitigation										
		2	2	1	1	1	2	14	L			
Air Quality												
Increased dust fallout	General maintenance activities	Before mitigation							Low	Negative	Apply dust suppressants to gravel roads used. Set speed limits to 40 km/h to minimise the creation of fugitive dust within the project boundary. Dust-reducing mitigation measures must be put in place and must be strictly adhered to, during the maintenance. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated.	
		4	2	2	2	2	2	24				L
		After mitigation										
		2	2	1	1	1	2	14	L			
Social												
Water provision to benefitting mines and industries.	Operation of raw water pipeline	Before mitigation							Low	Positive	Ensure that the raw water pipeline is in good working order and is regularly maintained.	
		4	4	2	3	2	4	60				M
		After mitigation										
		4	5	2	3	2	4	64	M			

8.3 Cumulative impacts

According to the NEMA EIA Regulations, 2014, cumulative impact in relation to an activity means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Construction and operational activities from the proposed project can result in several effects on the natural and social environment. Although many of these are direct, the environmental effects of individual activities can combine and interact with other activities in time and space which results in cumulative impacts. Effects from different activities could potentially accumulate to cause additional effects that may not be apparent when assessing the individual activities .

Table 8:5 provides a summary of the potential cumulative impacts of the proposed project.

Table 8:5 Cumulative impacts

Aspect	Cumulative impact	Significance
Vegetation and wetlands	Cumulative impacts are assessed in context of the extent of the proposed project area; other developments in the area; and general wetland loss and transformation resulting from other activities in the area. The expected post-mitigation risk significance is expected to be low, and the overall cumulative impact is therefore expected to be low. The cumulative impacts are further mitigated by the fact the new pipeline (SE2) will be constructed within the current pipeline (SE1) servitude. This servitude is already designated and prepared for the pipelines. The operational phase impacts are also low due to the fact the pipeline will be transporting raw water which posed no contamination risk to the wetlands.	Low (-)
Air quality	Cumulative dust generation in the area will increase due to construction activities, but will be limited to the construction phase only and is therefore considered a temporary impact. By implementing the proposed management measures, this impact will be well managed and will not have a lasting impact on the surrounding community.	Low (-)
Noise	Noise generated by the construction activities will add to the cumulative noise level. Construction activities, mainly earthmoving activities and movement of construction vehicles will add to the cumulative noise levels in the area. There are relatively few other noise sources in the area.	Low (-)
Heritage	As the proposed project will not impact on heritage features due to the proposed pipeline being outside of the required 30 m buffer zone around identified heritage features, no cumulative impact is expected.	Low (-)

9 CONCLUSION AND RECOMMENDATIONS

This chapter summarises the key findings of the Basic Assessment study and presents the EAP's conclusion and recommendations.

9.1 Summary of the potential impacts

A summary of the assessment of potential environmental impacts associated with the proposed project is provided in Table 9:1. The mitigated assessment assumes that technical design controls, as included in the project description, together with mitigation measures included would be implemented when the proposed project is constructed and operated. Most impacts identified had a significance rating of Medium without implementing mitigation measures, and could be reduced to a Low significance rating after implementing the proposed mitigation measures.

Table 9:1 Summary of significance of the potential impacts of the proposed project

Potential impact	Without mitigation	With mitigation	+/-
Impacts during construction phase			
Loss of soils to compaction and erosion	Medium	Low	-
Contamination of soils due to spilled concrete or hydrocarbons	Medium	Low	-
Destruction, fragmentation and degradation of habitats	Medium	Low	-
Loss of protected plant and tree species	Medium	Low	-
Spread and/or establishment of alien and/or invasive species	Low	Low	-
Introduction of nuisance vectors (pests) such as flies, rodents and baboons	Low	Low	-
Direct loss, disturbance and degradation of wetlands.	Medium	Low	-
Increased bare surfaces, runoff and potential for erosion and resulting sedimentation of the wetlands	Medium	Low	-
Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Medium	Low	-
Increased sediment loads to downstream reaches	Medium	Low	-
Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Medium	Low	-
Disruption of wetland soil profile and alteration of hydrological regime	Medium	Low	-
Impact on graves and cemeteries found along SE2 pipeline route	Medium – High	Low	-
Impact of the ephemeral walling at LWUA 04	Medium	Low	-
General rise in ambient noise levels	Medium	Low	-
Increased dust fallout around construction areas	Medium	Low	-
Benefits resulting from employment and income opportunities created by the construction of the pipelines	Low	Low	+

Potential impact	Without mitigation	With mitigation	+/-
Influx of people and construction workers leading to increased pressure on social services and infrastructure, social pathologies and disruptions, resulting in spontaneous settlements	Medium	Low	-
Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities	Medium	Low	-
Operational phase			
Disturbance to soils around watercourse crossings	Medium	Low	-
Contamination of soils due to spilled concrete or hydrocarbons	Medium	Low	-
Disturbance to local vegetation, leading to spread and/or establishment of alien and/or invasive species	Medium	Low	-
Disturbance to wetlands due to repair work undertaken at watercourse crossings	Medium	Low	-
Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Medium	Low	-
Increased raw water inputs to downstream wetlands	Low	Low	-
General rise in ambient noise levels	Low	Low	-
Increased dust fallout	Low	Low	-
Water provision to benefitting mines and industries.	Medium	Medium	+

9.2 Summary of specialist findings

The sections below summarise the findings of the vegetation, wetland, and heritage specialists.

9.2.1 Vegetation and wetland

The project area is situated within two vegetation types; the Sekhukhune Plains Bushveld and the Sekhukhune Mountain Bushveld, with the associated conservation status being classified as Vulnerable and Least Threatened respectively. A total of 12 species are listed as being Species of Conservation Concern, with six (6) provincially protected that could potentially occur in the area. The plant species sensitivity theme for the area is classified as medium.

Two wetland HGM types were identified and delineated within the 500 m regulated area. These include both channelled and unchanneled valley bottom wetlands. Further to this, a network of drainage lines and ephemeral watercourses were also delineated. A few artificial dams were identified and delineated for this project. The pipeline will traverse three HGM units, namely HGM 1 & HGM 3 (unchanneled valley bottom) and HGM 2 (channelled valley bottom) wetlands. These three units were the primary consideration for the ecological descriptions and associated risk assessment.

Overall, HGMs 1 and 2 scored Intermediate while HGM 3 scored Moderately Low in terms of their wetland ecosystem services. The overall integrity (or health) for HGM 1 and HGM 2 was determined to be Largely Modified, and HGM 3 was classified as Seriously Modified. The ecological classification for HGM 3 was determined to be Seriously Modified. The ecological importance and sensitivity for both wetland types were calculated to be High.

A buffer zone of 15 m has been calculated for all wetlands based on the extent and impacts of the construction and operation of the pipeline.

Considering the status and functioning of the wetland ecosystems, and furthermore the nature and requirements of the project, the proposed activities will result in direct impacts (minimal area) to three (3) wetlands. The construction and operation of the proposed pipeline upgrade is not anticipated to pose significant threats to the receiving wetlands provided the recommended mitigation is effectively applied. The overall cumulative impact is also expected to be low for the proposed pipeline.

Recommended conditions

- Delineated wetlands and buffer areas must be indicated on development plans.
- Adhere to the 15 m buffer area around the delineated wetlands. Only essential services, machinery and personnel are permitted within the wetland and buffer for installation of the pipeline. Refer to Figures 9:1 to 9:3.

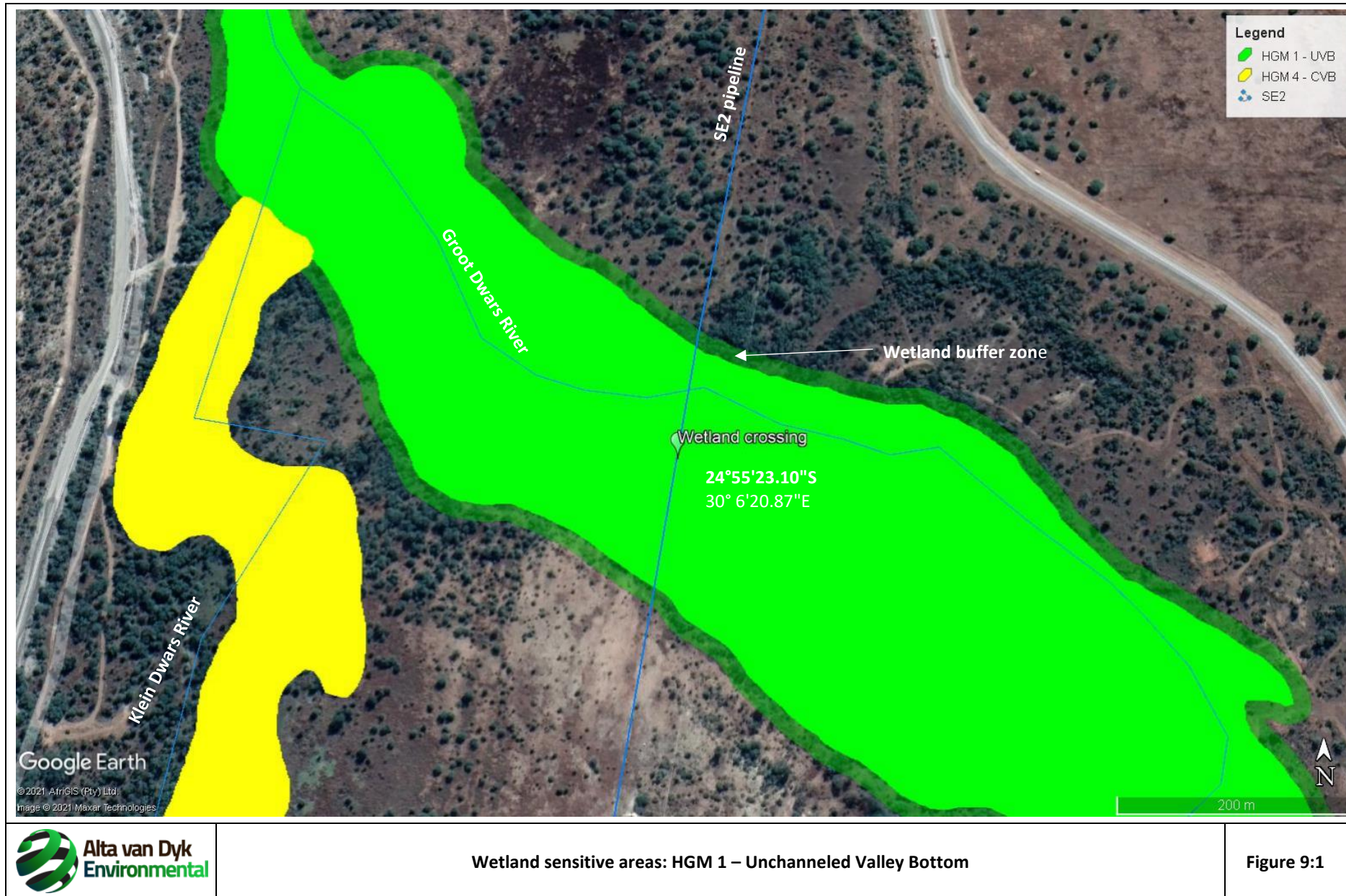
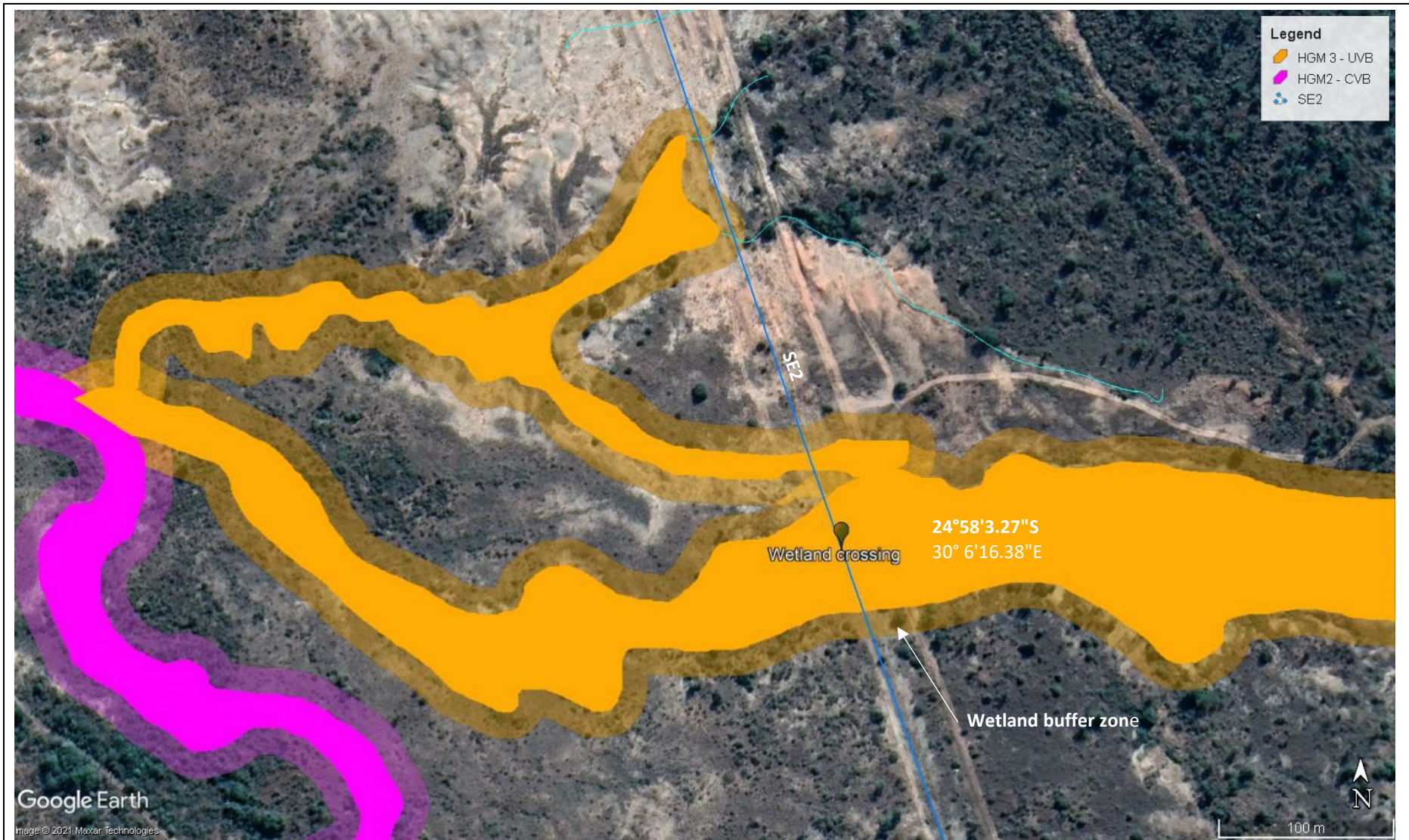


Figure 9:1 Wetland sensitive areas: HGM 1 – Unchanneled Valley Bottom



Wetland sensitive areas: HGM 3 – Unchanneled Valley Bottom

Figure 9:2

Figure 9:2 Sensitive wetland areas: Wetland sensitive areas: HGM 3 – Unchanneled Valley Bottom

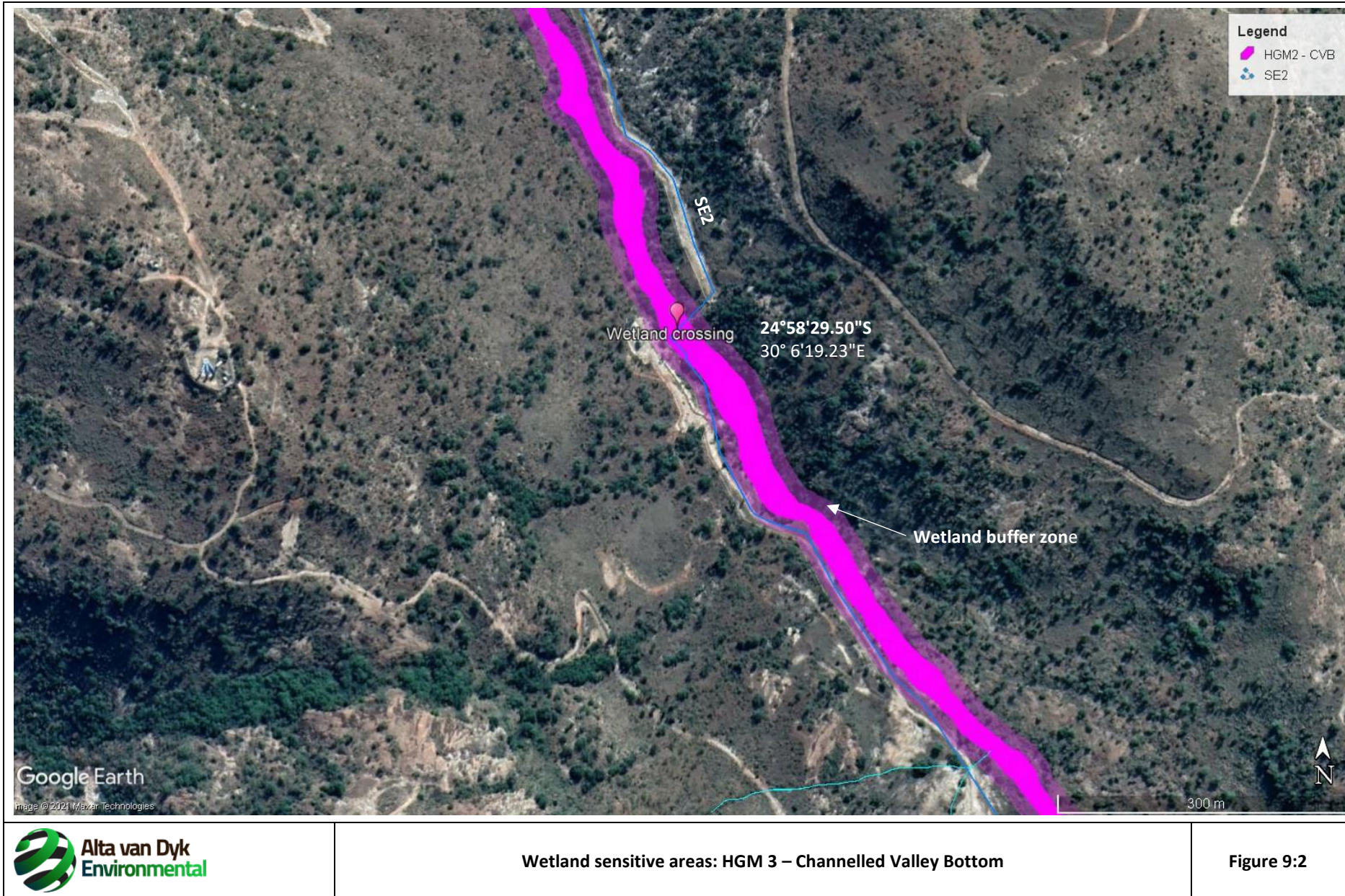


Figure 9:3 Sensitive wetland areas: Wetland sensitive areas: HGM 3 – Channelled Valley Bottom

9.2.2 Heritage

Previous disturbances relating to existing mining operations and pipeline are evident along the proposed SE2 route and would have destroyed surface evidence of heritage sites within the existing servitude. However, three burial sites (LWUA 1 – LWUA 3) and possible ephemeral Iron Age stone packed terrace site LWUA 4 were recorded. The burial sites are all located further than 30 meters away from the SE2 pipeline servitude. Graves and cemeteries are of high social significance but as these features will be avoided and preserved no direct impact is expected. Site LWUA 4 is impacted on by the existing pipeline and pipeline servitude and it is not certain that this is indeed an archaeological site with surface features being destroyed by the existing pipeline. Although unlikely, any impacts to subsurface heritage resources in this area can be successfully mitigated by implementing a chance find procedure.

The impact of the proposed project on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr, based on approval from SAHRA:

Recommended conditions

- It is recommended that all recorded burial sites should be indicated on development plans and avoided by the development (with a 30 m buffer). If this is not possible the graves can be relocated adhering to all legal requirements;
- The recorded Iron Age feature should be monitored during construction;
- Implementation of a chance find procedure for the project as per the HIA.

9.3 Environmental impact statement

The proposed SE2 pipeline and associated infrastructure project is not fatally flawed in any way. The construction and operational impacts, if effectively managed as per the mitigation measures recommended in this report and the EMPr, will have a low residual significance rating

Most of the potential impacts identified for this project will take place during the construction phase of the project. The construction phase is expected to last approximately 18 months and therefore most of the impacts associated with this project are temporary in nature. As the proposed infrastructure will be permanent features, impacts during closure have not been assessed as part of the basic assessment process, and closure cost have not been calculated for this project.

The no-go option will entail not constructing the proposed SE2 pipeline, or the associated infrastructure including new pump stations and the 10ML reservoir, and to continue as per the current status quo and environmental baseline. In addition, no impact on the bio-physical or social environment would not occur. However, should the proposed SE2 pipeline project not go-ahead, LWUA will not utilise the full volume of raw water allocated to them by the DWS and will not be able to meet the water requirements of its members.

All of the identified negative impacts during both the construction and operations phase with a significance rating of Medium without implementing mitigation measures, can be reduced to a Low significance rating after implementing the proposed mitigation measures.

It is the recommendation of the EAP that the proposed SE2 pipeline and associated infrastructure project is approved and allowed to proceed, on the assumption that the environmental and social mitigation measures as outlined in this report are adhered to, the project description remains as per the description provided in this document.

10 AFFIRMATION BY THE EAP

Appendix 1 Section 3 (1) (r) of the Environmental Impact Assessment (EIA) Regulations, 2014 require an undertaking under oath or affirmation by the EAP in relation to:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

AVDE and the EAP managing this project hereby affirm that:

- To the best of our knowledge the information provided in the report is correct, and no attempt has been made to manipulate information to achieve a particular outcome. Some information, especially pertaining to the project description, was provided by the applicant and/or their sub-contractors.
- To the best of our knowledge, all comments and inputs from stakeholders and interested and affected parties have been captured in the report and no attempt has been made to manipulate such comment or input to achieve a particular outcome. Written submissions are appended to the report while other comments are recorded within the report. For the sake of brevity, not all comments are recorded verbatim and are mostly captured as issues, and in instances where many stakeholders have similar issues, they are grouped together, with a clear listing of who raised which issue(s).
- Information and responses provided by the EAP to interested and affected parties are clearly presented in the report. Where responses are provided by the applicant (not the EAP), these are clearly indicated.

Refer to Appendix F for the undertaking under oath.

11 REFERENCES

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