



# Dwarsrivier Chrome Mine (Pty) Ltd

## Basic Assessment Report and Environmental Management Plan for the proposed upgrade to the North Mine Storm Water Channel

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Submission to Stakeholders

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## Executive Summary

### Introduction

Dwarsrivier Chrome Mine (Pty) Ltd (hereafter referred to as 'the mine' or 'Dwarsrivier Mine'), is wholly owned by Assore Limited. The mine is situated approximately 15km southwest of Steelpoort and 35km northwest of Lydenburg on the border between the Limpopo and Mpumalanga Provinces. The operation is located in the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality, in the Limpopo Province. The mine currently holds the surface rights for the Remaining Extent (RE) of Portion 1 and Portion 0 (RE) of the farm Dwarsrivier 372KT, as well as Portion 4 (a portion of Portion 3) of the farm De Grootboom 373KT. The mining rights are held over RE of Portion 1, Portion 0 (RE), Portion 6 and Portion 7 of the farm Dwarsrivier 372KT. The surface rights of Portions 6 and 7 of the farm Dwarsrivier 372KT are owned by Two Rivers Platinum Mine (TRP).

The project in question is located on Portion 0 (RE) of the farm Dwarsrivier 372KT.

The mine is located in the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality.

### Project Description

During 2018 an Environmental Authorisation Process was commissioned for the upgrade of the North Shaft Infrastructure. An Environmental Authorisation was issued to the mine by the Department of Mineral Resources and Energy (DMRE) during May 2019.

In order to protect the North Shaft infrastructure, a berm was constructed during the time when opencast mining operations were still undertaken (1990s). With the expansion activities associated with the North Shaft infrastructure it is required that this berm be upgraded.

The proposed project presented in this Basic Assessment Report (BAR) involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining infrastructure at North Shaft. The channel will be an earth channel, following a portion of the existing channel. The channel will also be established with a berm upgradient to ensure that dirty water cannot enter this system. The purpose of the proposed stormwater channel at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine's operational areas.

The channel will be approximately 0.6 kilometres (km) (610 metres [m]) in length and will be surrounded by an earth berm which varies in width (i.e. 10m to 30m) across its length.

### Listed Activities

Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) requires, upon request by the Minister, that an Environmental Management Plan (EMP) be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs) of the proposed project.

In terms of Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as read with the Environmental Impact Assessment (EIA) Regulations Process in terms of the NEMA EIA Regulations 982 (Regulation 983, Regulation 984 and Regulation 985) as amended in 2022, there are three (3) listing notices which should be considered for this application. These listing notices were amended during June 2021. Listing Notice 1 (Regulation 983) activities require a Basic Assessment Process, whereas Listing Notice 2 (Regulation 984) activities require a full EIA Process. Listing Notice 3 (Regulation 985) activities require a Basic Assessment Process if the area falls within certain geographic zones.

When considering Listing Notice 3, the following was considered:

- Small portions of the mining area where infrastructure is located are located in a Critical Biodiversity Area 1 (CBA1), which includes the greater part of the proposed channel upgrade.
- In the past the Sekhukhuneland Mountainlands ecosystem was listed as being Endangered. In terms of the 2022 revised List of Threatened Ecosystems (18 November 2022, Government Notice 2747), the extent of Dwarsrivier Mine now falls within the Sekhukhune Mountain Bushveld ecosystem that is listed as Least Concern and not threatened. The National Screening Tool still requires to be updated in line with this new legislation.

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The mine is also located within 10km (but not within 5km) of the De Hoop Dam Protected Environment, a protected environment (2019) and within 3.5km from a Protected Area (Mpumalanga Mesic Grasslands). Therefore, Listing Notice 3 is only applicable when considering the location of the activities within the CBA.

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m <sup>2</sup> )	LISTED ACTIVITY	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)  <i>Key Considerations – Project area is located within a CBA1.</i>	WASTE MANAGEMENT AUTHORISATION
Storm Water Channel	1.8ha; 610m in length	x	<p><b>Listing Notice 3, Activity 4:</b> The development of a road wider than 4 metres with a reserve less than 13,5 metres. (A road may potentially be required to serve as an access and service route) (a Critical Biodiversity Area 1 (CBA1) is present).</p> <p><b>Listing Notice 3, Activity 12:</b> The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a Maintenance management plan. (Due to the majority of this channel, about 1.6ha, being located within a CBA1).</p> <p>Listing Notice 1, Activity 27 is not applicable as this activity specifically excludes “linear” infrastructure, which includes trenches/channels: “The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.”</p> <p><i>Note that the channel is to be located outside of the 1:100-year floodline of both the Springkaanspruit and the Groot Dwarsrivier. It is also important to note that according to the 2022 revised threatened ecosystem list (18 November 2022, Government Notice 2747), this area (Sekhukhune Mountainlands) does not fall within a threatened ecosystem, although the National Screening Tool still indicates that it does.</i></p>	-

### Aim and Motivation of the Project

The proposed project relating to the current Environmental Authorisation process involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining infrastructure at North Shaft. The purpose of the stormwater trench at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine’s operational areas. This is a condition in terms of the approved Water Use Licence (WUL) Ref 24053346, dated 21 January 2008, which states that: *Storm water at the plant area shall be managed in accordance with Government Notice 704 and storm water leaving the premises shall in no ways be contaminated by any substance.*

### Alternatives Considered

No location alternatives were investigated for this project. The channel is being upgraded upgradient of existing infrastructure in accordance with design drawings. The only alternative is the no-go alternative. By not implementing the upgrade, the mine will not be able to give effect to managing activities in line with GN704 (clean and dirty water

separation). Another consideration by not implementing this project, is potential safety hazards due to flooding of the infrastructure should the clean water not be routed around the activities.

### Application and Consultation Process

The Basic Assessment application for the proposed project was submitted to the DMRE on 14 February 2023 and confirmation of receipt was received via a telephone call with Mr. Kolani Thivhulawi on 16 February 2023. A letter of acknowledgement from the DMRE has not been received to date.

In terms of the Basic Assessment Environmental Authorisation Process, a detailed stakeholder consultation process is being undertaken and notification of I&APs of the proposed project commenced on 8 March 2023. The notification process was undertaken by means of the following:

- ☛ Newspaper advertisement in the Steelburger/ Lydenburg News, dated 8 March 2023;
- ☛ Site Notices erected at the Truck Parking/Discard Dump Entrance, Main Offices entrance, as well as the North Mine entrance; and
- ☛ Direct Notifications through a Background Information Document (BID) were distributed to all stakeholders on the registered I&AP database on 16 March 2023.

The draft Basic Assessment Report (BAR) was made available to stakeholders from 11 April 2023 to 10 May 2023 for review. All comments received as part of the consultation process have been included into this report. It should be noted that no WUL is required as part of this project, the mine will however have to obtain an exemption from GN704 for the location of the channel within 100m of the Springkaanspruit.

### Impact Statement

The following positive impacts are foreseen:

- ☛ The project will allow for clean and dirty water management around the North Mine Infrastructure.

Please refer to Table 28 to Table 30 for the detailed impact and management discussion associated with the project.

The project is implemented to manage water resources. For this reason limited negative impacts are foreseen with the implementation of the correct management measures. The key areas to monitor would be soil erosion, the velocity of water flow and impact on the ecological setting.

Key areas of management in terms of water resources and soil management will require:

- ☛ Construction activities to be undertaken during the dry season;
- ☛ The stabilisation of the channel with the planting of indigenous grasses (active revegetation), and the implementation of energy dissipaters, especially horizontally across the channel to ensure that grass establishment can take place;
- ☛ Energy dissipaters at the discharge point of the clean water, which will be located outside of the 1:100 year floodline.

As the only direct impact is on ecology, this section will provide more details based on the discussions presented in Table 28 to Table 30.

The direct impact of the proposed trench development on the floral ecology is anticipated to vary between low and very low prior to the implementation of mitigation measures. If mitigation measures are implemented, the impact significance for the proposed trench development are anticipated to reduce.

Prior to mitigation measures the i) Pre-construction & Planning Phase, ii) Construction and Operational Phase and iii) Decommissioning & Rehabilitation Phase scored an impact significance as follows:

- ☛ Pre-construction & Planning Phase: This phase scored an impact of low;
- ☛ Construction and Operational Phase: This phase scored an impact significance of medium-low to low; and
- ☛ Decommissioning & Rehabilitation Phase: This phase scored an impact significance of low.

With mitigation measures implemented, the direct and indirect impacts on the floral ecology for the identified roads may be reduced as follows:

- ☛ Pre-construction & Planning Phase: With the implementation of mitigation measures, this phase scored a lowered impact significance of very low;
- ☛ Construction and Operational Phase: With the implementation of mitigation measures, this phase scored a lower impact significance of medium-low to very low; and

- ☛ Decommissioning & Rehabilitation Phase: With the implementation of mitigation measures, this phase scored a lowered impact significance of very low.

As part of the proposed mitigation measures, all disturbed areas, including areas not within the development footprint, must be rehabilitated appropriately and AIP establishment controlled within such areas.

#### Impact on Floral Habitat and Diversity

The data gathered during the site visit and from the reviewed studies indicate that the Mixed Bushveld Habitat is of intermediate sensitivity. The most significant impacts deemed likely to affect the floral habitat integrity and species diversity within the proposed development footprint include, but are not limited to, the following:

- ☛ Loss of indigenous floral habitat and diversity resulting from vegetation clearing activities;
- ☛ AIP proliferation into adjacent natural vegetation displacing indigenous flora and altering favourable habitat conditions for the establishment of indigenous species.

#### Impacts on Floral Species of Conservation Importance

Suitable habitat for an array of floral species of conservation importance is available within the Mixed Bushveld Habitat. Such species include threatened species, nationally protected species as per the NFA, NEMBA TOPS as per the 2023 regulations, and/or provincially protected species as per the LEMA. It should be noted that during the field assessment conducted during August 2022 (which focused on identifying and characterising NFA protected *Sclerocarya birrea subsp. caffra* individuals in the surrounding areas) were not observed within this footprint area.

It is advised that a walkthrough of the project footprint areas be conducted before the commencement of any development or construction activities. Should any species of conservation importance be encountered within this footprint area these must be rescued and relocated by a suitably qualified specialist either to suitable habitat (outside the development footprint) or moved to the mine's nursery or registered nurseries such as the Agricultural Research Council (ARC) or the South African National Biodiversity Institute (SANBI). Permits must be obtained from the relevant authorities to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

#### Impact on CBAs, ESAs, Threatened Vegetation and Protected Areas

Although the proposed storm water channel development is located within significant biodiversity features, e.g., within CBA1 habitat and within a previously Threatened Ecosystem (namely the Sekhukhune Mountainlands ecosystem), the scale of the proposed development and therefore the associated impacts are expected to be less significant and unlikely to alter the function of the ecosystem, provided that strict implementation of proposed mitigation measures occurs. The surrounding natural vegetation within the local region is unlikely to be impacted by the proposed development if mitigation measures and monitoring is implemented.

#### Impact on hydrological resources

The following provides a summary of the key findings of the study:

- ☛ In terms of the GN704 regulated zones, it was found that all of the proposed infrastructure falls within the 100 m watercourse buffer; and
- ☛ The impact/risk assessment showed that all of the risks would have a medium significance pre-mitigation and a low significance post-mitigation.

The following is recommended:

- ☛ It is recommended that the proposed infrastructure that falls within the 100 m watercourse buffer, is motivated to be exempted from GN704;
- ☛ Vegetation clearance should be kept to an absolute minimum.
- ☛ Temporary erosion measures should be employed at exposed areas.
- ☛ Exposed areas should be vegetated as soon as possible.
- ☛ The stormwater channel is proposed to be grassed which will assist to prevent erosion.
- ☛ Grassing must be undertaken immediately after construction.
- ☛ Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel.
- ☛ Regular monitoring of the channel should be undertaken, specifically in the wet season and after large storm events.
- ☛ The channel should be repaired immediately if damaged.

### Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving floral ecological environment are deemed likely. The following points highlight the key latent impacts that have been identified:

- ☞ Loss of floral habitat within the footprint area;
- ☞ Loss of natural habitat associated with the surrounding areas and CBA1 due to edge effects;
- ☞ Loss of floral species diversity with the footprint area; and
- ☞ Continued AIP proliferation within the disturbance footprint and spread of these into adjacent vegetation communities.

### Cumulative Impacts

The greatest threat to the floral ecology within the surrounding area of the proposed project, apart from loss to mining expansion include the continued proliferation of AIP species, which may contribute towards loss of indigenous floral communities within the local area. It should be noted that despite current, isolated footprint, if additional developments occur in this ecosystem and/or CBA then impacts on surrounding natural and CBA would need to be carefully considered.

### **Gaps**

No gaps have been identified in terms of this project to date.

### **Concluding Statement**

Based on the outcomes of the study it is the opinion of the Environmental Assessment Practitioner (EAP) that the Environmental Authorisation should be awarded, with the following conditions:

- ☞ An independent Environmental Control Officer (ECO) must be appointed to assess the construction activities at least once a month to ensure that all components of the EMP are addressed.
- ☞ An ecologist should be appointed prior to construction activities to undertake a walkdown of the project footprint in order to determine whether threatened or protected floral species are present on site.
- ☞ In the event that such species are present, the relevant plant removal permits have to be applied for where required.
- ☞ It must be ensured that no activities may be established within either 100m of a river or within the 1:100-year flood line, if not approved in terms of the National Water Act, 1998 (Act No. 36 of 1998).



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## List of Annexures

- Annexure 1: DMRE Acknowledgment of Receipt and proof of submission
- Annexure 2: EAP Curriculum Vitae
- Annexure 3: Specialist Studies
- Annexure 4: Stakeholder Consultation Documentation



**mineral resources**  
Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

**BASIC ASSESSMENT REPORT**  
**And**  
**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

<b>NAME OF APPLICANT:</b>	<b>Dwarsrivier Chrome Mine (Pty) Ltd</b>
<b>TEL NO:</b>	<b>+27 (0) 13 230 5300</b>
<b>FAX NO:</b>	<b>+27 (0) 13) 230 5318</b>
<b>POSTAL ADDRESS:</b>	<b>PO Box 567, Lydenburg, 1120</b>
<b>PHYSICAL ADDRESS:</b>	<b>Dwarsrivier Farm 372 KT, Sekhukhune Road, Steelpoort Area, 1133</b>
<b>FILE REFERENCE NUMBER SAMRAD:</b>	<b>Mining Right Reference Number: 30/5/1/3/2/1(179) EM</b>

## 1 IMPORTANT NOTICE

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*In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.*

*Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment. In terms of section 16(3) (b) of the EIA Regulations, 201 (as amended) 4, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.*

***It is therefore an instruction that*** the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

***It is furthermore an instruction that*** the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un- interpreted information and that it unambiguously represents the interpretation of the applicant.

Please refer to Annexure 1 for the proof of submission of the Environmental Authorisation Application Form.

## 2 OBJECTIVE OF THE BASIC ASSESSMENT

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The objective of the basic assessment process is to, through a consultative process—

- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b) identify the alternatives considered, including the activity, location, and technology alternatives;
- c) describe the need and desirability of the proposed alternatives,
- d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - a. the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - b. the degree to which these impacts—
    - i. can be reversed;
    - ii. may cause irreplaceable loss of resources; and
    - iii. can be managed, avoided or mitigated;
  - c. through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
    - i. identify and motivate a preferred site, activity and technology alternative;
    - ii. identify suitable measures to manage, avoid or mitigate identified impacts; and
    - iii. identify residual risks that need to be managed and monitored.



## PART A

### SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

The application for the Basic Assessment Project was submitted to the Department of Mineral Resources and Energy (DMRE) on 14 February 2023 with confirmation received on 16 February 2023 (Mr. Kolani Thivhulawi). A letter of acknowledgement from the DMRE has not been received at the time of the compilation of this report. The draft Basic Assessment Report (BAR) was made available to stakeholders from 11 April 2023 to 10 May 2023 for review.

Please refer to Annexure 1 for the submitted Environmental Authorisation application form and proof of submission.

### 3 CONTACT PERSON AND CORRESPONDENCE ADDRESS

#### 3.a Details

##### 3.a.i Details of the EAP

Table 1: Details of EAP

<b>Name</b>	Tanja Bekker
<b>Designation</b>	Environmental Assessment Practitioner (EAP)
<b>Postal Address</b>	PO Box 22014, Helderkruijn, 1733
<b>Physical Address</b>	64 Blouberg Street, Noordheuwel, 1739
<b>Telephone Number</b>	+27 (0) 82 412 1799
<b>Cell Phone Number</b>	+27 (0) 82 412 1799
<b>Fax Number:</b>	+ 27 (0) 86 551 5233
<b>Email Address</b>	tanja@envirogistics.co.za

##### 3.a.ii Expertise of the EAP

The following table presents a summary of the EAPs experience:

Table 2: Experience of EAP

Name	Position	Qualification	Professional Registrations	Experience
Tanja Bekker	Registered Environmental Assessment Practitioner	M.Sc. Environmental Management (RAU; now University of Johannesburg)	Environmental Assessment Practitioners Association of South Africa (EAPASA) Reg No. 306/2019 Professional Natural Scientist (Pr.Sci.Nat) with the South African Council for National Scientific Professions (SACNASP) Reg No. 400198/09 Member of the International Association of Impact Assessors (IAIA) Member of the Environmental Law Association of South Africa (ELA)	21 Years

Please refer to Annexure 2 for the EAP's Curriculum Vitae.

#### Education

- M.Sc. Environmental Management – RAU (University of Johannesburg)
- B.Sc. Geography Honours – RAU (University of Johannesburg)
- B.Sc. Earth Sciences (Geography & Geology) – RAU (University of Johannesburg)

#### Career Enhancing Courses

- ISO 14000 Lead Auditors Course (WTH Management)
- Certificate in Project Management (University of Pretoria)
- Management Advance Programme (MAP 81) (Wits Business School)

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### Professional Affiliations

Registered member of EAPASA  
Registered as a Professional Natural Scientist with SACNASP  
Certified ISO 14001 Environmental Management System Auditor  
Member of the South African affiliate of the IAIA  
Member of ELA

### Summary of the EAP's past experience

**Ms. Bekker** is registered as a Professional Natural Scientist with SACNASP and is also a registered Environmental Assessment Practitioner (EAP) with EAPASA, a legal requirement stipulated by the National Environmental Management Act, 1998. She is further certified as an ISO 14001 Lead Auditor. Her qualifications include a BSc. Earth Sciences (Geology and Geography), BSc. (Hons.) Geography, and a MSc. Environmental Management. In addition to these tertiary qualifications, she obtained a Certificate in Project Management, and completed the Management Advance Programme at Wits Business School.

With more than 21 years' working experience in environmental management and the consulting industry and managing various Large Account Clients, she understands the South African Regulatory System, and can advise client with due diligence on their environmental regulatory requirements and offer a solution driven service to their project life cycle. She is equipped with exceptional project management and coordination skills, which especially enhances the service she offers clients within the environmental permitting system.

Her key focus is environmental management and compliance with extensive experience in the mining industry. Project Management and Coordination of projects form a critical component of her duties, which include project planning, initiation of projects, client, authority and stakeholder consultation, specialist coordination, budget control, process control, quality control and timeframe management. Her interest lies in a client advisory capacity, being involved during due diligence investigations, pre-project development and assisting the client and engineering team in adding value to develop the project in an environmentally sustainable manner, considering client costs and liabilities, as well as considering the implication of environmental authorisation conditions and requirements on project deliverables. Her involvement in projects has spanned over the project life cycle from Due Diligence Investigations, Pre-Feasibility Investigations, Prospecting Right Applications, Mining Right Applications, Environmental Reporting and implementation and auditing of Environmental Management Plans and Authorisations.

### *3.a.iii Details of the Applicant*

Dwarsrivier Chrome Mine (Pty) Ltd (hereafter referred to as "Dwarsrivier Mine" or "the mine") is wholly owned by Assore Ltd ("Assore").

According to information obtained from the official Dwarsrivier Mine Web Page, the mine originated as a result of neighbouring properties to the north and south thereof, which had existing chrome mining operations at the time of purchase in 1998. The owners of Dwarsrivier Mine, therefore invested in a feasibility study for the Plant, old Tailings Storage Facility (hereafter referred to as the "Old TSF") and the mining of chrome. The designs for the opencast and underground mines then commenced. Approval to proceed with the final design and construction of work was given in July 1999 (<http://www.assmang.co.za/chrome.asp>). The mine ceased opencast operations in 2006 and is currently operating as an underground (trackless, board and pillar operation) mine, producing chromite ore, with a Dense Medium Separation and Spiral Beneficiation Plant. Dwarsrivier Mine currently produces approximately 200 000 tons of chromite ore per month.

The mine was previously owned by Assmang (Pty) Ltd ("Assmang") with a 50% share. This results from the approval by the Department of Mineral Resources (DMR) (now the Department of Mineral Resources and Energy [DMRE]) of the Section 11 Transfer in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) of Dwarsrivier Mine from African Rainbow Minerals (ARM) to Assore. The change of ownership officially came into effect on 1 August 2016.

Table 3: Details of Applicant

<b>Project applicant:</b>	Dwarsrivier Chrome Mine (Pty) Ltd
<b>Registration no (if any):</b>	2011/105280/07
<b>Trading name (if any):</b>	N/A



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<b>Responsible Person, (e.g. Director, CEO, etc.):</b>	Environmental Representative		
<b>Contact person:</b>	Mr Pieter Schoeman		
<b>Physical address:</b>	The mine is situated 15km outside of Steelpoort on the Remaining Extent (RE) of Portion 1 and Portion 0 (RE) of the farm Dwarsrivier 372KT and Portion 4 (a Portion of Portion 3) of the Farm De Grooteboom 373KT		
<b>Postal address:</b>	PO Box 567, Lydenburg		
<b>Postal code:</b>	1120	Cell:	+27 (0) 76 028 7680
<b>Telephone:</b>	+27 (0) 13 230 5300	Fax:	+27 (0) 13 230 5318
<b>E-mail:</b>	pieters@dwarsrivier.co.za		

### 3.a.iv Environmental Authorisations

The mine is operating with all required environmental authorisations:

Table 4: List of Environmental Authorisations

#	Legislation	Licence	Reference	Date
1	Minerals Act, 1991 (Act No. 50 of 1991)	Approval for Dwarsrivier Phase II Chrome Project	OT6/2/2/426A	14 December 1999
2	National Water Act, 1998 (Act No. 36 of 1998) (NWA)	Regulation 4b (GN704) Exemption for undermining 2006	16/2/7/B400/C83/1	12 September 2006 (no longer applicable, replaced by the WUL, 2008)
3	NWA	Overall Water Use Licence (WUL)	16/2/7/B4000/C83 (24053346)	21 January 2008, amended 10 June 2021
4	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)	Environmental Management Programme (EMPr)	-	December 2010
5	NWA	WUL – Tailings Dam	04/B41G/G/792	8 July 2011, amended 28 June 2021
6	National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	Environmental Authorisation for the proposed construction of a new Tailings Storage Facility	12/1/9-7/1e/GS4	9 July 2011
7	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA)	Waste Licence – Hazardous Waste Temporary Storage Facilities <sup>1</sup>	12/9/11/L290/5	21 July 2011
8	MPRDA	Dwarsrivier Mine Tailings Storage Facility Environmental Management Programme	LP30/5/1/3/2/1(179)EM	22 August 2011
9	MPRDA	Approval for Three Plants	LP30/5/1/3/2/1 (179)EM	11 January 2012
10	NEMWA	Waste Licence – Temporary General Waste Storage Facilities	12/4/10-A/1/GS3	29 March 2012
11	NEMA	Construction of a Low-Level Bridge over the Groot Dwarsrivier	12/1/9/1-GS22	11 June 2012
12	NEMA	Environmental Permission for Construction of a Bridge over the Springkaanspruit River	12/1/9/1-GS62	19 September 2013
13	NWA	WUL – River Crossings	04/B41G/CI/2240	4 October 2013, amended 10 August 2021
14	NEMA	Section 24G Rectification	12/1/9-7/S24G/7-GS1	26 August 2014
15	NEMWA & NEMA	Integrated Environmental Authorisation	179EM	15 February 2018
16	NEMA	Integrated Environmental Authorisation	179EM	29 May 2019
17	NEMA	Centralised Store	179EM	15 March 2021

<sup>1</sup> Note that the Licence Holder has not and will not be commissioning the activity. The Environmental Authorisation has therefore not been implemented on site. The Licence Holder is not in contravention with the Environmental Authorisation.

### 3.b Location of the Activity

#### 3.b.i Location of the Mine

Dwarsrivier Mine is situated approximately 15km southwest of Steelpoort and 35km northwest of Lydenburg on the border between the Limpopo and Mpumalanga Provinces. The operation is located in the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality, in the Limpopo Province. The mine currently holds the surface rights for Remainder of Portion 1 (Portion 1) and Portion 0 (Remaining Extent) of the farm Dwarsrivier 372KT, as well as Portion 4 (a portion of Portion 3) of the farm De Grooteboom 373KT.

The operation is located in the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality.

The R577 roadway that connects to the R555 (Lydenburg-Roosenekal road), is situated to the north of the plant and mine offices. The overall area is characterised by intensive mining development. Various servitudes traversing the site are present, which include gravel roads, telephone lines and electricity lines. Please refer Figure 1 and Figure 2 illustrating the location and cadastral setting of the mine.

Dwarsrivier Mine falls in the quaternary catchments B41G and B41H in the Olifants Water Management Area (WMA B4). All surface water draining from the properties ultimately flows into the Groot Dwars River and the Klein Dwars River, the confluence of which is located on north-western portion of the property. From the confluence, the Dwars River flows northwards into the Steelpoort River. Dwarsrivier Mine has an exemption (Reference Number 16/2/7/B400/C83/1) from the then Department of Water Affairs (DWA; now the Department of Water and Sanitation [DWS]), which allows the operation to undermine the Groot Dwars River.

Several of the neighbouring farms, namely Tweefontein 380JT, Thorncliffe 374KT, De Grooteboom 373KT and Dwarsrivier 372KT are owned by mining houses with existing and operational chrome and platinum mines. On the remainder of the neighbouring farms, agricultural activities take place, in the form of stock grazing and the production of vegetables, Lucerne and cotton.

Please refer to the following table for the registered name, administrative jurisdiction and summary of location of the land.

Table 5: Property Information where the activities are planned

<b>Farm Name:</b>	Farm Dwarsrivier 372KT Portion 0 (RE)
<b>Magisterial district:</b>	The mine falls within the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality.
<b>Distance and direction from nearest town:</b>	Dwarsrivier Mine is situated approximately 15km southwest of Steelpoort and 35km from Lydenburg on the border between Limpopo and Mpumalanga Provinces. The mine itself falls under the jurisdiction of the Limpopo Province.
<b>21 digit Surveyor General Code for each farm portion:</b>	RE (Portion 0) of the farm Dwarsrivier 372KT - TOKT0000000037200000

#### 3.b.ii Ownership of Land

Dwarsrivier Mine has been mining chromite ore from the LG6 seam since 1999. Between 1999 and 2005, ore was mined using opencast methods. The six (6) pits have subsequently been mined out and backfilled with the exception of the South and North Pit portals from which access is gained to the underground workings. The current mine plan extends the life of the operations to the year 2042.

Assmang bought the farm Dwarsrivier 372KT (Portions 1 and Portion 0 [RE]), including all surface and mineral rights, in October 1998 for R163 million. In 2002, the mine purchased a portion of the farm De Grooteboom 373KT, subdividing this portion into Portion 4 (a portion of Portion 3).

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The mine holds the surface rights on RE of Portion 1, Portion 0 (RE) of the farm Dwarsrivier 372KT and Portion 4 (a Portion of Portion 3) of the farm De Grooteboom 373KT. The mining rights are held over RE of Portion 1, Portion 0 (RE), Portion 6 and Portion 7 of the farm Dwarsrivier 372KT. The surface rights of Portions 6 and 7 of the farm Dwarsrivier 372KT are owned by Two Rivers Platinum Mine (TRP).

The property details are presented in the following table:

Table 6: Landownership

Farm Name	Portion	Title Deed Number	Property Size	Ownership	Mining Rights
Dwarsrivier 372KT	0 (RE)	T24/2021	489ha	Assore Ltd	Assore Ltd
Dwarsrivier 372KT	1	T24/2021	843ha	Assore Ltd	Assore Ltd
De Grooteboom 373KT	Portion 4 (a Portion of Portion 3)	T24/2021	52ha	Assore Ltd	Assore Ltd
Dwarsrivier 372KT	6	48140/2005PTA	1879ha	Two Rivers Platinum (Pty) Ltd	Assore Ltd
Dwarsrivier 372KT	7	T9520/2008PTA	261ha	Two Rivers Platinum (Pty) Ltd	Assore Ltd

A Section 11 transfer in terms of the MPRDA has been applied for whereby Assore takes over all administrative and technical services, as well as the sales and marketing function of the mine. This application has been successful and therefore Assore is now 100% owners of Dwarsrivier Mine in terms of the mineral and surface rights.

There are registered land claims on the Dwarsrivier Mine surface rights area. The Bakone Ba Masha is represented by Mr Caswell Pokwane (makgalepokwane@gmail.com) who is replacing the previous representative, Mr Mashegoane. The Bakone Ba Masha are the land claimants of the farm Dwarsrivier. The Bakoni Ba Mmadi are the land claimants of the farm De Grooteboom, and is represented by Mr. Dudu Mmadi and Mr. Chris Mmadi of the Bakoni Ba Mmadi Communal Property Association (CPA) (bakonibammadic236@gmail.com; proteafarm.community@gmail.com; ledubatrading02@gmail.com).

The Bakoni Ba Mmadi are not impacted by the proposed project.

Refer to Figure 2 for the cadastral setting of the mine.

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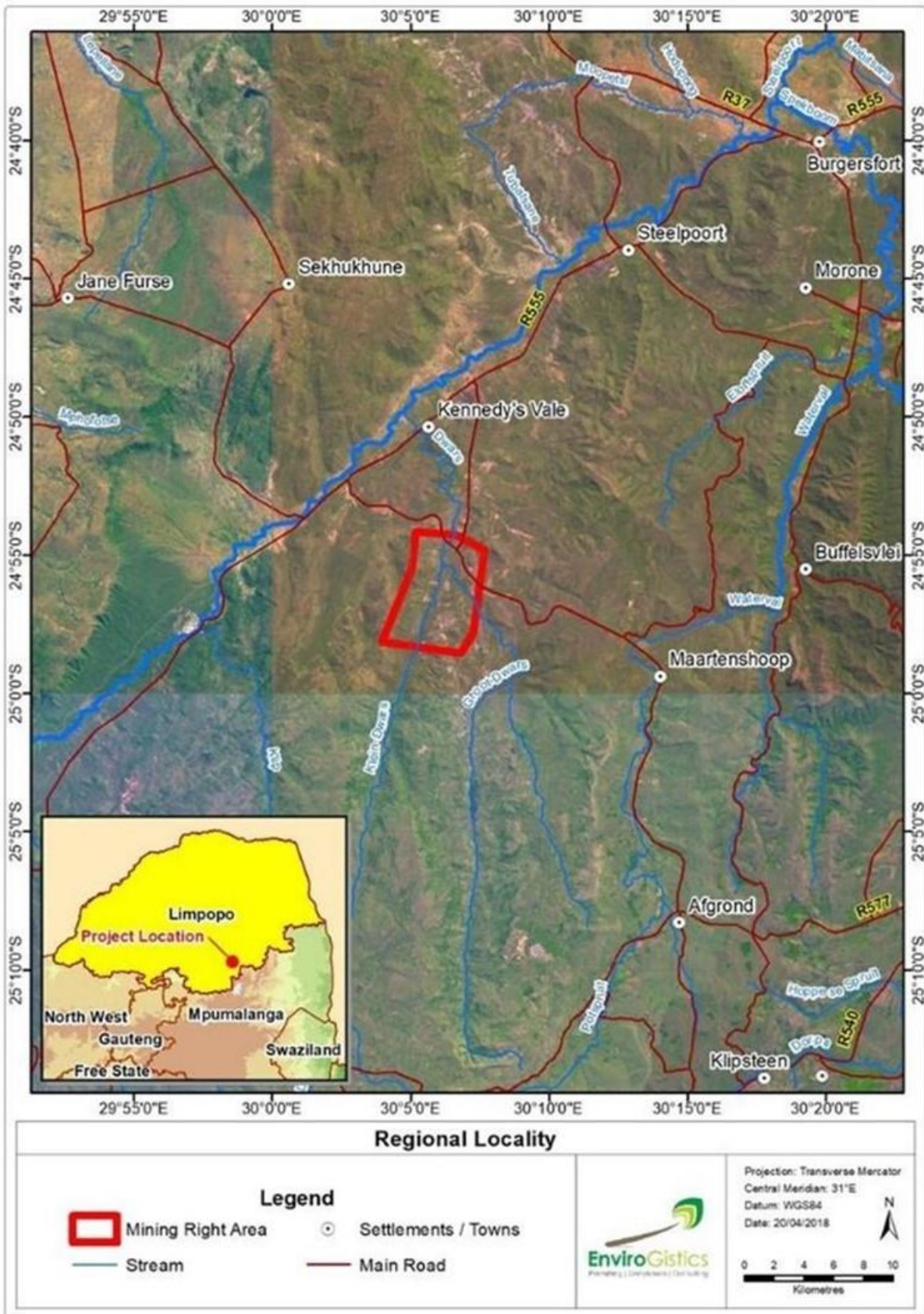


Figure 1: Local and Regional Setting



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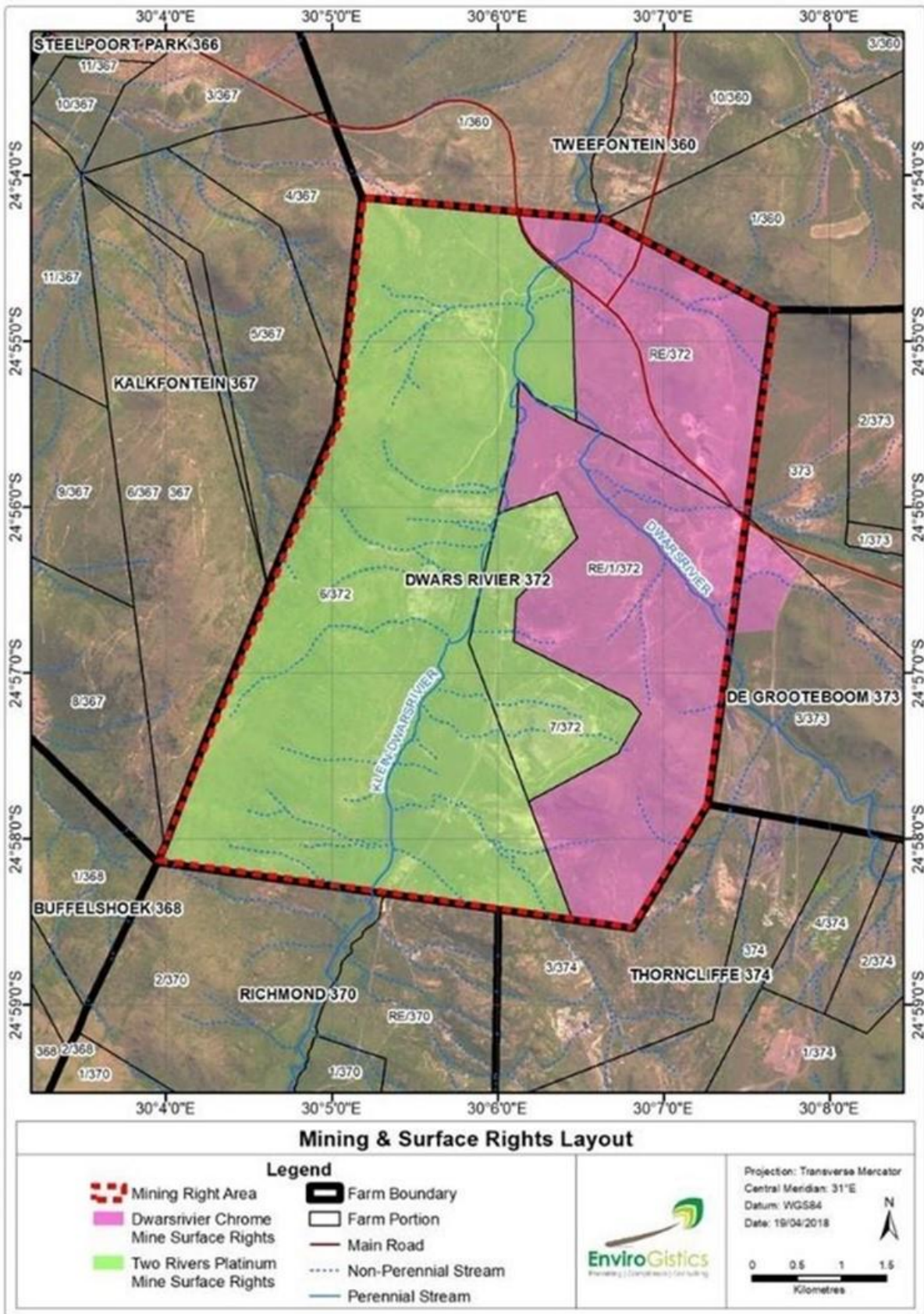


Figure 2: Cadastral Information

### 3.b.iii Listed Activity Location and Size

The activity in question and a brief location description is presented in the following table:

Table 7: Property Location

<b>Farm Name:</b>	Portion 0 (RE) of the Farm Dwarsrivier 372KT
<b>Application area (Ha)</b>	Approximately 1.8ha in extent (610m length)
<b>Magisterial district:</b>	Dwarsrivier Mine is located within the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality.
<b>Distance and direction from nearest town</b>	Dwarsrivier Mine is situated approximately 15km southwest of Steelpoort and 35km northwest of Lydenburg on the border between the Limpopo and Mpumalanga Provinces. The operation is located in the Fetakgomo Tubatse Local Municipality, within the boundaries of the Sekhukhune District Municipality, in the Limpopo Province.
<b>21 digit Surveyor General Code for each farm portion</b>	RE (Portion 0) of the farm Dwarsrivier 372KT - TOKT00000000037200000

The following table presents the coordinates for the proposed activity involved in this application:

Table 8: Coordinates

Activity	Farm Portion	Coordinate	Size (ha approx.)
Upgrade of Storm Water Channel	Portion 0 (RE) of the Farm Dwarsrivier 372KT	Start Point: 24°55'42.69"S; 30° 7'24.34"E  End Point: 24°55'59.57"S; 30° 7'30.23"E	Approximately 1.8ha in extent (610m length)

### 3.c Locality Map

The following figure presents the location of the proposed activities within the approved mine surface rights and indicates the portion of the site located within a Critical Biodiversity Area (CBA1).





Figure 3: Location of the proposed Activity in relation to sensitive settings

### 3.d Description of the Scope of the Proposed Activity

During 2018 an Environmental Authorisation Process was commissioned for the upgrade of the North Shaft Infrastructure. An Environmental Authorisation was issued to the mine by the DMRE to the Mine during May 2019.

In order to protect the North Shaft infrastructure a berm was constructed during the time when opencast mining operations were still undertaken (1990s). With the expansion activities associated with the North Shaft infrastructure it is required that this channel be rerouted and upgraded.

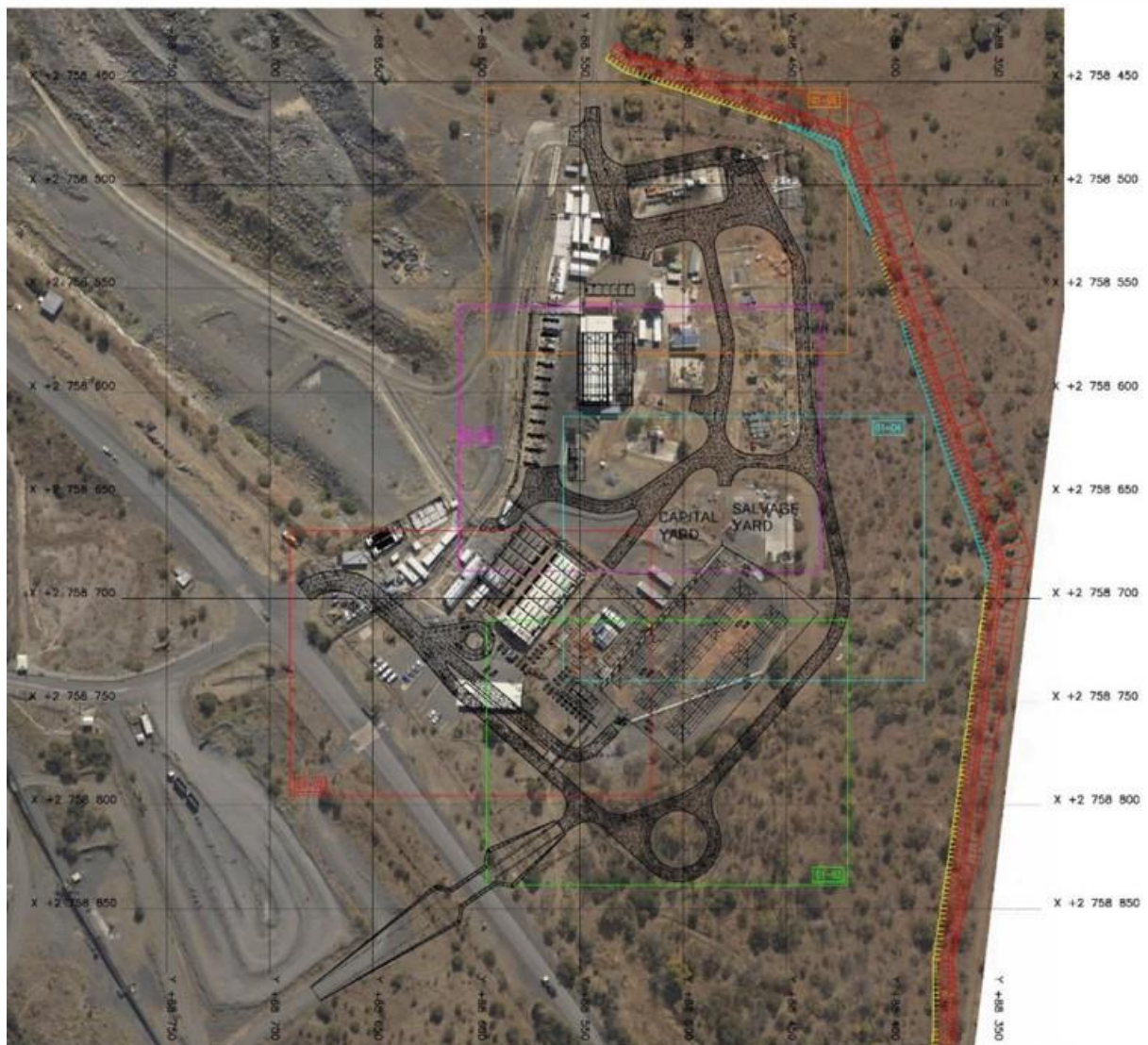


Figure 4: Location of proposed Project in relation with the North Shaft Infrastructure

The proposed project presented in this Basic Assessment Report (BAR) involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining infrastructure at North Shaft. The channel will be an earth channel, following a portion of the existing channel. The channel will also be established with a berm upgradient to ensure that dirty water cannot enter this system. The purpose of the proposed stormwater channel at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine's operational areas.



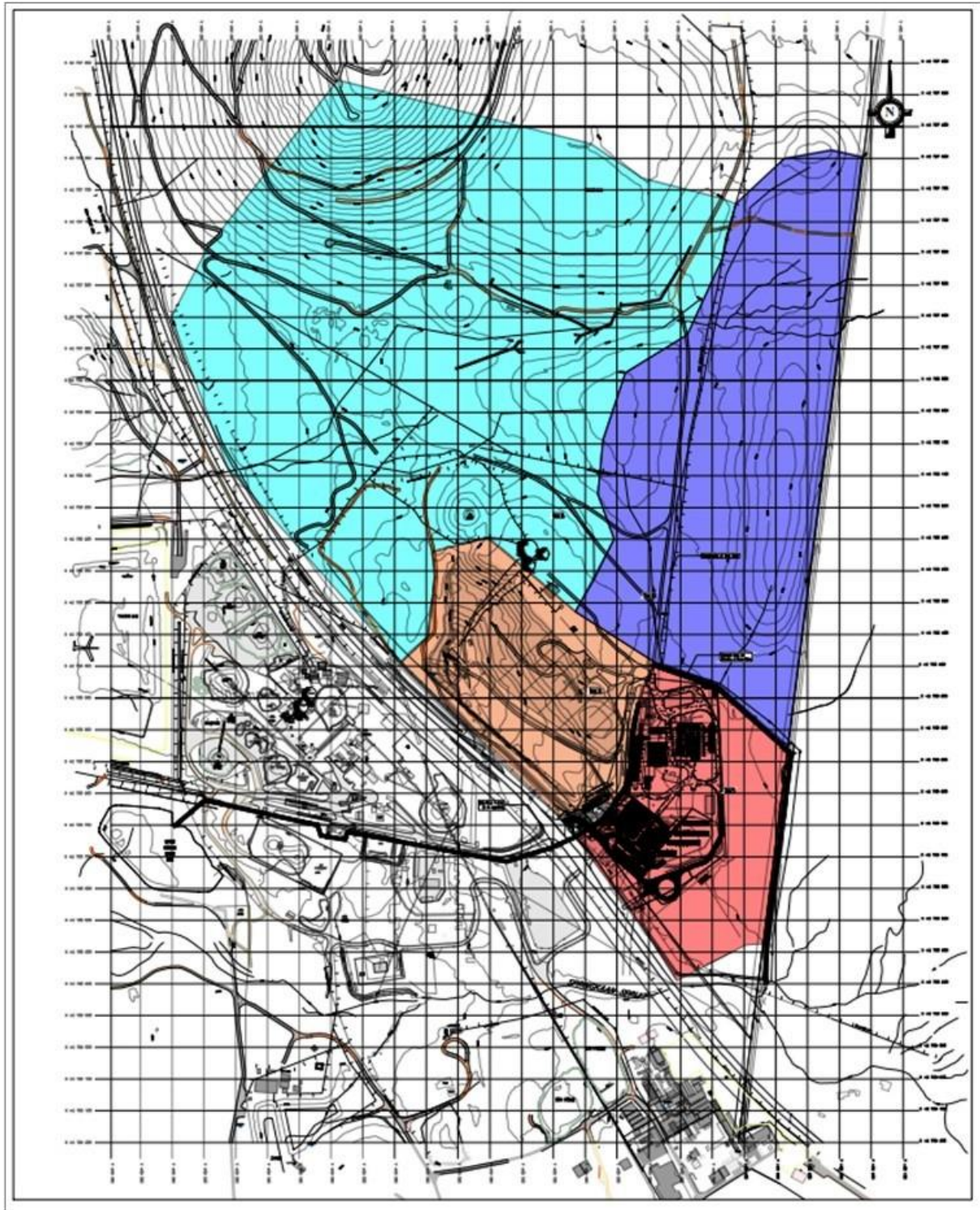


Figure 5: Various Clean and Dirty Water Areas around the North Mine Infrastructure

The channel will be an earth channel. The separation and management of clean and dirty stormwater is an operational requirement for all mining operations within South Africa. The diverted clean stormwater will be discharged south of North Shaft. The channel will be approximately 0.6 kilometres (km) (610 metres [m]) in length and will be surrounded by an earth berm which varies in width (i.e. 10m to 30m) across its length. The overall area that the channel will encompass will be approximately 1ha.

The channel has been sized to convey a flow rate of 9 m<sup>3</sup>/s, which will be discharged into the Springkaanspruit.

### 3.d.i *Listed and Specified Activities*

#### **National Environmental Management Act, 1998 (NEMA)**

Section 16 of the MPRDA requires, upon request by the Minister, that an Environmental Management Plan (EMP) be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs) of the proposed project.

In terms of Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as read with the Environmental Impact Assessment (EIA) Regulations Process in terms of the NEMA Regulations 982 (Regulation 983, Regulation 984 and Regulation 985) as amended in 2021, there are three (3) listing notices which should be considered for this application. These listing notices were amended during June 2022. Listing Notice 1 (Regulation 983) activities require a Basic Assessment Process, whereas Listing Notice 2 (Regulation 984) activities require a full Environmental Impact Assessment (EIA) Process. Listing Notice 3 (Regulation 985) activities require a Basic Assessment Process if the area falls within certain geographic zones.

When considering Listing Notice 3, the following was considered:

- ☛ Small portions of the mining area where infrastructure is located are located in a Critical Biodiversity Area 1 (CBA1), which includes the greater part of the proposed channel upgrade.
- ☛ In the past the Sekhukhuneland Mountainlands ecosystem was listed as being Endangered. In terms of the 2022 revised List of Threatened Ecosystems (18 November 2022, Government Notice 2747), the extent of Dwarsrivier Mine now falls within the Sekhukhune Mountain Bushveld ecosystem that is listed as Least Concern and not threatened. The National Screening Tool still requires to be updated in line with this new legislation.
- ☛ The mine is also located within 10km (but not within 5km) of the De Hoop Dam Protected Environment, a protected environment (2019) and within 3.5km from a Protected Area (Mpumalanga Mesic Grasslands). Therefore, Listing Notice 3 is only applicable when considering the location of the activities within the CBA.

#### **National Heritage Resources Act, 1999 (NHRA)**

According to Regulation 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), any development or other activity which will change the character of a site exceeding 5 000m<sup>2</sup> in extent requires notification to the South African Heritage Resources Agency (SAHRA).

#### **National Environmental Management: Waste Act, 2008 (NEMWA)**

Regulation 921 of the NEMWA, , dated 29 November 2013 and as amended, makes provision for lists of waste management activities that have, or are likely to have a detrimental effect on the environment. The amendments of the list of waste management activities dated 24 July 2015 makes provision for the inclusion of Residue Stockpiles or Deposits. For the purposes of this project, no activities which require approval in terms of the NEMWA is proposed.

#### **National Water Act, 1998 (NWA)**

Chapter 4 of the NWA specifically addresses the use of water and is a tool for an authority to ensure the implementation of the principle that National Government has overall responsibility over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. In general, a water use must be licensed unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. Section 21 of the NWA identifies eleven (11) consumptive and non-consumptive water uses which must be authorised.

In terms of Section 21 of the NWA and associated regulations, the activity in question does not trigger a Water Use Licence (WUL). Exemption from GN704 will however be required for any activity located within 100m from a watercourse.

### 3.d.ii *Description of the Activities to be undertaken*

The activities that will form part of the proposed project will include the following:

- ☛ Planning Phase:
  - Ensure the implementation of Legal Requirements (Environmental Authorisations).

- ☛ Construction Phase:
  - Land and footprint clearance (minimal; below 2ha of vegetation clearance);
  - Topsoil stripping and stockpiling as berms;
  - Excavation of trench/ channel;
  - Placement of energy dissipators (vegetation and cladding); and
  - Construction waste management and minimal domestic and hazardous waste management (the latter only considered due to presence of construction equipment).
- ☛ Operational Phase:
  - General Environmental Management (Alien Invasive Plant [AIP] Species and Erosion Control); and
  - Water Monitoring.
- ☛ Closure Phase:
  - Ensure the implementation of Legal Requirements (Environmental and Closure Authorisations/Permits);
  - Grading and vegetation of area upon successful rehabilitation of North Shaft Mining infrastructure; and
  - Domestic, hazardous and demolition waste management.

Dwarsrivier Chrome Mine: Basic Assessment Report and Environmental Management Programme for the Proposed upgrade to the North Mine Storm Water Channel  
Mining Right Ref: 30/5/1/3/2/1(179) EM  
Project Ref: 202227  
Version: Final

Table 9: Listed Activities

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m <sup>2</sup> )	LISTED ACTIVITY	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985)  <i>Key Considerations – Project area is located partially within a CBA1.</i>	WASTE MANAGEMENT AUTHORISATION
Storm Water Channel	1.8ha; 610m in length	x	<p><b>Listing Notice 3, Activity 4:</b> The development of a road wider than 4 metres with a reserve less than 13,5 metres. (A road may potentially be required to serve as an access and service route) (a Critical Biodiversity Area 1 (CBA1) is present).</p> <p><b>Listing Notice 3, Activity 12:</b> The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a Maintenance management plan. (Due to the majority of this channel, about 1.6ha, being located within a CBA1).</p> <p>Listing Notice 1, Activity 27 is not applicable as this activity specifically excludes “linear” infrastructure, which includes trenches/channels: “The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.”</p> <p><i>Note that the channel is to be located outside of the 1:100-year floodline of both the Springkaanspruit and the Groot Dwars River. It is also important to note that according to the 2022 revised List of Threatened Ecosystems (18 November 2022, Government Notice 2747), this project area does not fall within a threatened ecosystem anymore, although the National Screening Tool still indicates that it does.</i></p>	-

### 3.e Policy and Legislative Context

Please refer to the following table for the policy and legislative context.

Table 10: Policy and Legislative Context

Applicable Legislation and Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
The Constitution of South Africa (Act No. 108 of 1996)	Sustainable development is relevant to all projects.	<p>The Constitution reigns supreme and the advancement of human rights is one of the foundations of South Africa’s democracy. Furthermore, the Bill of Rights plays a central role in the democratic regime because it embodies a set of fundamental values which should be promoted at all times. An environmental right is contained in Section 24 and is, arguably, the cornerstone for environmental governance in South Africa, which includes the mining industry. Section 24(a) proclaims the right of everyone “to an environment that is not harmful to their health or well-being”. Mining companies are thus duty-bound to constitutional, legislative, and other measures to prevent pollution and ecological degradation, promote conservation and to develop in a sustainable manner.</p> <p>The Constitution cannot manage environmental resources as a stand-alone piece of legislation, hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations is designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.</p>
<b>National Legislation</b>		
National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	This Draft Basic Assessment Report	<p>In respect of the Listed Activities in terms NEMA, Section 24F(1)(a) of NEMA stipulates the following:</p> <p><b><i>“no person may- commence an activity listed or specified in terms of section 24(2)(a) or (b) unless the competent authority or the Minister of Minerals and Energy, as the case may be, has granted an environmental authorisation for the activity...”</i></b></p> <p>Section 24F is clear in its prohibition that only those “<b>listed or specified</b>” activities may not commence without prior Environmental Authorisation. Consequently, the activities to be conducted by the Mine will only trigger Environmental Authorisation requirements when these said activities trigger a listed or specified activity referred to in Section 24F.</p> <p>Furthermore, note that the law is clear in that NEMA and its Regulations <b>do not have retrospective working</b>. Accordingly, in terms of the various Listing Notices promulgated since 1997, it is paramount to link the commencement date of the specific activities with the corresponding Listed Activities.</p> <p>There are currently five sets of EIA Regulations which govern potential Listed Activities. The focus should be on if <b>and when</b> a Listed Activity was commenced with in terms of the specific Regulations; i.e.:</p> <ul style="list-style-type: none"> <li>☛ Environmental Conservation Act, 1989 (ECA) Listed Activities, promulgated in terms of the ECA (effective between 08 September 1997 and end of day 09 May 2002);</li> <li>☛ ECA Listed Activities, promulgated in terms of the ECA (effective between 10 May 2002 and before end of day 02 July 2006);</li> <li>☛ The 2006 EIA Regulations, 2006 Listing Notice 1 and 2006 Listing Notice 2 (effective between 03 July 2006 and end of day 01 August 2010);</li> <li>☛ The 2010 EIA Regulations, 2010 Listing Notice 1, 2010 Listing Notice 2 and 2010 Listing Notice 3 (effective between 02 August 2010 and end of day 07 December 2014.); and</li> </ul>



Applicable Legislation and Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p>☛ The 2014 EIA Regulations, 2014 Listing Notice 1, 2014 Listing Notice 2 and 2014 Listing Notice 3 (commencement date 08 December 2014, as amended in April 2017 and June 2021).</p> <p>Accordingly, an activity must be assessed in terms of the specific Regulations applicable at the time of commencement of the specific activity.</p> <p>EnviroGistics undertook a detailed review of the listed activities according to the proposed project description to assess the listed activities that are considered applicable. The assessment was undertaken in line with the 2022 EIA Listed Activities. An Environmental Authorisation in terms of the NEMA is required.</p> <p>The Basic Assessment Application fee of R2 000 was paid to the DMRE on 13 February 2023. An Application for Environmental Authorisation was couriered to the DMRE on 14 February 2023 and was telephonically confirmed to be received on 16 February 2023.</p> <p>The DMRE has to date not officially acknowledged the application (Refer to Annexure 1).</p> <p><i>Under the One Environmental System, the Minister of Mineral Resources and Energy will issue environmental authorisations in terms of the NEMA for mining activities related to the primary extraction and/or primary processing of ore material. The Minister of Fisheries, Forestry and the Environmental will form the appeal authority.</i></p>
<p>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 1998) (MPRDA)</p>	<p>Existing Mining Right, amendments to activities and addition to infrastructure and activities on site.</p>	<p>Since 2004, the MPRDA has been the principal piece of legislation that regulates the South African mineral and petroleum sector.</p> <p>The MPRDA was enacted with the objectives of promoting local and rural development, ensuring equal access to minerals, and eradicating discriminatory practices in the industry, while still guaranteeing security of tenure to participants in the industry and increasing the industry's international competitiveness.</p> <p>Recent amendments to NEMA and the MPRDA have been published with the objective to align NEMA and the MPRDA authorisation processes as well as to provide for cooperative governance between the DMRE and the Department of Environmental Affairs (DEA) (now the Department of Forestry, Fisheries and Environment [DFFE]).</p> <p>The governing provisions in respect of EMPr's were removed from the MPRDA and incorporated into Sections 24N, 24O, 24P, 24Q, 24R and 24S of NEMA.</p> <p>The project does not entail any additional authorisation for mining rights in terms of the MPRDA. The surface infrastructure will be located within the approved mining area within Dwarsrivier Mine. No changes to the Mining Work Programme are required at this time.</p>
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA)</p>	<p>The NEMWA waste activities are not being triggered as part of this project. However, this legislation is considered in the development of waste management measures and</p>	<p>The NEMWA fundamentally reformed the law regulating waste management, and for the first time provides a coherent and integrated legislative framework addressing all the steps in the waste management hierarchy. The objectives of the NEMWA are to protect health, well-being and the environment by providing reasonable measures for, <i>inter alia</i>, remediating land where contamination presents, or may present, a significant risk of harm to health or the environment.</p> <p>The objectives of the NEMWA are structured around the steps in the waste management hierarchy, which is the overall approach that informs waste management in South Africa. The waste management hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority; i.e.: waste avoidance, reduction, re-use, recycling, recovery, treatment, and safe disposal as a last resort.</p> <p>NEMA, as previously mentioned, introduced a number of additional guiding principles into South African environmental legislation, including the life-cycle approach to waste management, producer responsibility, the precautionary principle and the polluter pays principle (i.e. the sustainability</p>

Applicable Legislation and Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
	<p>assessing potential impacts.</p>	<p>principles as contained in Section 2 of NEMA). Section 5(2) of the NEMWA stipulates that the Act should be interpreted and guided in accordance with these sustainability principles.</p> <p>The NEMWA, furthermore, echoes the duty of care provision in terms of Section 28 of NEMA, by obliging holders of waste to take reasonable measures to implement the waste management hierarchy. Section 16(1) of the NEMWA provides that:</p> <p><b>“A holder of waste must, within the holder’s power, take all reasonable measures to –</b></p> <ul style="list-style-type: none"> <li><b>a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;</b></li> <li><b>b) reduce, re-use, recycle and recover waste;</b></li> <li><b>c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;</b></li> <li><b>d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;</b></li> <li><b>e) prevent any employee or any person under his or her supervision from contravening this Act; and</b></li> <li><b>f) prevent the waste from being used for an unauthorised purpose.”</b></li> </ul> <p>When considering whether a “substance” is considered a “waste” or not, the definition of the NEMWA must be considered. The NEMWA defines “waste” as:</p> <p><b>“Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 of this Act; or</b></p> <p><b>Any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette.”</b></p> <p>This proposed project does not include any NEMWA related waste activities.</p>
<p>The Hazardous Substances Act, 1973 (Act No. 15 of 1973) (HSA)</p>	<p>Management of Chemicals</p>	<p>Although not planned, if required, all chemicals transported to and stored on site will be handled in accordance with the HSA and the applicable Material Safety Data Sheets. A chemical log will be kept and all the necessary signage erected on site.</p>
<p>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</p>	<p>Potential presence of heritage sites during construction and excavation activities.</p>	<p>Section 34 and 38 of the NHRA details specific activities that require an approved Heritage Impact Assessment by SAHRA.</p> <p>A heritage assessment was undertaken to comply with Regulation 38 of the NHRA. The SAHRA forms part of the Interested and Affected Parties (I&amp;APs), and the draft Basic Assessment Report will be made available for comment. According to the paleontological sensitivity of the study area indicated as insignificant and low on the SAHRA Paleontological map and no further studies are required in this regard.</p>
<p>National Water Act, 1998 (Act No. 36 of 1998) (NWA)</p>	<p>Establishment of facilities containing waste or water containing waste.</p>	<p>One of the main and ever-continuing concerns in South Africa is the sustainability of water management, and the costs associated with the prevention and remediation of pollution. The NWA is one of the government’s answers to some of these challenges and functions as sectoral legislation within the framework of NEMA.</p> <p>Section 19 of the NWA echoes the duty of care envisaged in Section 28 of NEMA and addresses the prevention and remediation of the effects of pollution. The NWA provides for a broad duty of care in that:</p>

Applicable Legislation and Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p><b><i>“(1) an owner of land, a person in control of land or a person who occupies or uses the land on which-</i></b></p> <p><b><i>a) any activity or process is or was performed or undertaken; or</i></b></p> <p><b><i>b) Any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.”</i></b></p> <p>The words “likely to cause pollution” broadens the scope of the duty, which enables an activity, or situation that is land-based, to trigger the application of the duty. The “reasonable measures” are not prescribed, but may include measures intended to:</p> <p><b><i>“Cease, modify or control any act or process causing the pollution; comply with any prescribed waste standard or management practice; contain or prevent the movement of pollutants; eliminate any source of pollution; remedy the effects of pollution; and remedy the effects of any disturbance to the bed and banks of a watercourse.”</i></b></p> <p>The NWA, furthermore, provides for water use authorisations which a mine will have to apply for, before commencing with its primary activity of mining. Water uses that need to be licensed under Section 21 of the NWA include:</p> <ul style="list-style-type: none"> <li>a) Taking water from a water resource;</li> <li>b) Storing water;</li> <li>c) Impeding or diverting the flow of water in a watercourse;</li> <li>d) Engaging in a stream flow reduction activity;</li> <li>e) Engaging in a controlled activity;</li> <li>f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;</li> <li>g) Disposing of waste in a manner which may detrimentally impact on a water resource;</li> <li>h) Disposing in any manner of waste which contains waste from, or which has been heated in , any industrial or power generation process;</li> <li>i) Altering the bed, banks, course or characteristics of a watercourse;</li> <li>j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and</li> <li>k) Using water for recreational purposes.</li> </ul> <p>This proposed project will be located outside of the 100m buffer of the watercourses and also outside of the 1:100 year floodline.</p>
<p>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)</p>	<p>Relevant to protected tree removals, as well as to development within the CBA.</p>	<p>The NEMBA addresses a number of issues related to biodiversity and how it should be protected and managed in undertaking development activities.</p> <p>The purpose of the NEMBA is to provide for the management and conservation of South Africa’s biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment (updated in 201 as the National Biodiversity Assessment) was developed.</p> <p>The operation has an approved permit to authorise actions and activities affecting Protected Trees (Ref: LP-SDM-2017-06-06-B). The Permit was valid up until 26 June 2018. For this project, an ecological assessment has been undertaken to determine the sensitivity of the ecological setting. The necessary tree/ plant removal permits will be applied for. The DFFE is included as an I&amp;AP and will also receive and opportunity to comment on the draft Basic Assessment Report (comments were received on the draft Basic Assessment Report).</p> <p>According to the Fetakgomo Tubatse Municipality Integrated Development Plan (IDP), the largest proportion of land in the area (probably in excess of 80%) is natural environment. The mines, agriculture and urban development have barely encroached on these wilderness areas. The wilderness generally comprises of bushveld and sparse grassland in limited parts of the municipality. It is important to preserve the wilderness for posterity and</p>



Applicable Legislation and Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
		<p>harvest plant and animal species in a manner that preserve this habitat. For this reason, the IDP states that an investigation on the occurrence of Red Data Listed (RDL) species (Species of Conservation Concern (SCC)) in the area should be undertaken to identify any hotspots for conservation, as information on this aspect is lacking for the local municipality.</p>
<p><b>Municipal Plans</b></p>		
<p>Integrated Development Plan (IDP) (Final IDP/Budget 2020/2021 Consolidated IDP for the Fetakgomo Tubatse Local Municipality and IDP 2022/2023.</p>	<p>Economic Development  IDP Vision 2030: “A developed platinum city for the benefit of all”</p>	<p>The IDP states that in the medium to long term it is intended to create a more prosperous Fetakgomo Tubatse Local Municipality through provision of services, social cohesion and nation building, local economy and job creation, help to adapt to the changing climatic conditions, integrated communities, public participation and accountability, education, health, fighting against fraud and corruption. The IDP lists a number of statements, which includes:</p> <ul style="list-style-type: none"> <li>☛ Develop and Strengthen Local Economies for Job Creation</li> <li>☛ Improving Health in Rural Communities</li> <li>☛ Education</li> <li>☛ Building Spatially Integrated Communities</li> <li>☛ Improving Public Participation and Accountability</li> </ul> <p>The Municipal Mission Statements are:</p> <ul style="list-style-type: none"> <li>☛ Accountable through active community participation</li> <li>☛ Economic enhancement to fight poverty and unemployment</li> <li>☛ Render accessible, sustainable and affordable service</li> <li>☛ Municipal transformation and institutional development</li> <li>☛ Sustainable livelihoods through environmental management</li> </ul> <p>The IDP states that amongst others, opportunities offered by the local municipality include: (a) mining investment opportunity; (b) land availability opportunity; (c) tourism opportunity; (d) funding source opportunity from private sector; and (e) job creation opportunity from infrastructure investment.</p> <p>The IDP states clearly that with the exception of the creativity of people, mining still presents the largest opportunity in the area to a sustainable economic base whereby the local economy and the area is growing at a higher pace. Mining is regarded as an opportunity offered by the municipality, with the IDP stating that the mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality. The municipality will be able to develop sector plans, policies and by-laws which will be utilised for the planning of the area and regulate both the internal and external affairs.</p>
<p>Land Claims</p>	<p>According to the IDP and Commission of Restitution of Land Rights</p>	<p>The following land claims exist on RE of Portion 1 and Portion 0 (RE) of the farm Dwarsrivier 372KT:</p> <ul style="list-style-type: none"> <li>☛ Masha LA-Masha Lengwai community (KRP 12317)</li> <li>☛ Leshaba LB – Galeshaba Community (KRP 798)</li> <li>☛ Mashigwana KJ (4270)</li> <li>☛ Mashegoane M S (KRP 4270)</li> </ul>

Applicable Legislation and Guidelines Used To Compile The Report	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
National Development Plan (NDP)	Local Municipality within the National and Provincial Planning Context	<p>The IDP/ Budget proposes to argue that South Africa displays what could be seen or described as a “top-down, and, at the same time, bottom-up” process of development planning. The NDP is a plan for the country to encourage long term planning i.e. up to 2030. The municipality incorporates the long term visioning as espoused in the NDP. The following six pillars have widespread merits for strategic planning:</p> <ul style="list-style-type: none"> <li>☛ Unite all South Africans around a common programme to fight poverty and inequality and promote social cohesion;</li> <li>☛ Have South Africans be active citizens in their community and in the development of the country;</li> <li>☛ A growing and inclusive economy with higher investment, better skills, rising savings and greater levels of competitiveness;</li> <li>☛ Building capabilities of the people and the state;</li> <li>☛ A developmental state capable of correcting historical inequalities and creating opportunities for more people while being professional, competent and responsive to the needs of all citizens; and</li> <li>☛ South African leaders putting aside narrow sectarian interests in favour of national interest and putting the country first.</li> </ul>
Limpopo Development Plan (LDP) 2015 - 2019	Support to the IDP	<p>The strategy outline of the IDP draws linkages with reference to the Limpopo development objectives. As a corollary, the LDP (2015-2019) identifies the municipality under the platinum cluster due to its considerable potential and competitive advantage for economic cluster development. The municipality is also identified as a provincial growth point.</p> <p>Specifically, this Fetakgomo Tubatse Local Municipality and Musina Local Municipality were identified as Special Economic Zones. The entire planning outline of the IDP/ Budget is designed on the floor plan of the provincial and national contexts.</p>

### 3.f Need and Desirability of the Proposed Activities

Currently, Dwarsrivier Mine is serviced by 1 200 permanent and 800 contractor employees. The majority of the employees are locals drawn from Lydenburg and villages around the mine, including Steelpoort Park, Kalkfontein and Buffelshoek.

The proposed project relating to the current Environmental Authorisation process involves the upgrade of the stormwater channel and associated berm at the DCM North Shaft to accommodate the expanded mining infrastructure at North Shaft. The purpose of the stormwater trench at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine's operational areas. This is a condition in terms of the approved Water Use Licence (WUL) Ref 24053346, dated 21 January 2008, which states that: *Storm water at the plant area shall be managed in accordance with Government Notice 704 and storm water leaving the premises shall in no ways be contaminated by any substance.*

### 3.g Motivation for the Overall Preferred Site, Activities and Technology Alternative

No location alternatives were investigated for this project. The berm is being upgraded upgradient of existing infrastructure in accordance with design drawings. The only alternative is the no-go alternative. By not implementing the upgrade, the Licence Holder will not be able to give effect to managing activities in line with GN704 (clean and dirty water separation). Another consideration by not implementing this project, is potential safety hazards due to flooding of the infrastructure should the clean water not be routed around the activities.

### 3.h Full Description of the Process followed to reach the proposed Preferred Alternative within the site

#### 3.h.i Details of the Development Footprint Alternatives Considered

Please refer to the earlier Section 3.f and 3.g presenting the discussion on the alternatives.

### 3.i Details of the Public Participation Process Followed

This section includes the comments received during the Public Participation Process undertaken to date. The Comments and Responses Section has the following objectives:

1. To provide a formal and integrated record of all the issues raised by I&APs to date, and the responses provided by the Basic Assessment Report study team.
2. To provide a mechanism that allows all parties participating in the process (including the Competent Authorities) to verify whether the issues raised have been considered and where appropriate, adequately addressed by Basic Assessment Report study team.

Issues raised will be recorded through a variety of mechanisms. These include:

- 📄 Comments sheets received by e-mail;
- 📄 Comments sent to the public participation office via e-mails;
- 📄 Comments received telephonically; and
- 📄 Comments received during the announcement phase when interested Communities were met on site.

The Public Participation Process during the Basic Assessment Application of the project consisted of the following activities:

- 📄 Communication with regulatory authorities and municipal authorities;
- 📄 Communication with surrounding landowners;
- 📄 The identification and engagement with the general public;
- 📄 Placement of notifications and advertisements in local newspapers;
- 📄 Placement of posters and notifications on site and in close proximity to the site;
- 📄 The Public Participation Process will be an ongoing activity and will only be concluded once the decision for the Environmental Authorisation has been issued. All I&APs will be informed as to the final decision taken by the Department.

### 3.i.i Stakeholder Identification

The mine’s current Stakeholder Database was utilised as a basis for the development of the consultation register for this project. In addition, relevant government Departments, municipalities and affected ward councillors were contacted to inform them of the proposed project and to obtain their issues and comments in this regard. The following stakeholders were consulted as part of the project:

- ☞ DWS;
- ☞ DMRE;
- ☞ Limpopo Department of Economic Development, Environment and Tourism (LEDET);
- ☞ DFFE;
- ☞ Local Municipality;
- ☞ District Municipality;
- ☞ Surrounding Landowners;
- ☞ Land Claimants; and
- ☞ Other Identified Stakeholders.

Please refer to Annexure 4 for the list of stakeholders consulted.

### 3.i.ii Stakeholder Identification and Notification

Notification of I&APs commenced on 8 March 2023. The notification process was undertaken by means of the following:

- ☞ Newspaper advertisements;
- ☞ Site Notices;
- ☞ Direct Notifications through a Background Information Document (BID).

Please refer to Annexure 4 for copies of these notifications. Proof of email submissions can be requested from the EAP.

### 3.i.iii Site Notices

In order to inform surrounding communities and adjacent landowners of the proposed project, three site notices were erected on site (on 8 March 2023) and at visible locations close to the site.

Site Notices were placed at the following locations:

- ☞ North Mine Entrance;
- ☞ Main Offices Entrance; and
- ☞ Truck Parking Entrance.



Main Entrance



Truck Parking (Planned Ventilation Shaft Project)



**North Mine Entrance (Planned Storm Water Channel Upgrade Project)**

*Figure 6: Proof of Site Notices*

### *3.i.iv Background Information Documents*

Background Information Documents (BIDs) were distributed via email to all parties on the existing database on 16 March 2023. Please refer to Annexure 4 for a copy of this document.

### *3.i.v Advertisements*

The formal announcement of the proposed project was done by placing an advert in the Steelburger News on 8 March 2023 to invite all I&APs to register on the project database. The objective of this newspaper advertisement was to:

- ☞ Inform I&APs of the proposed project;
- ☞ Inform I&APs of the Basic Assessment procedure and the way in which I&APs could lodge any objections to the proposed development and provide comments; and
- ☞ Invite I&APs to become involved in the proposed project by registering as I&APs.

Please refer to Annexure 4 for a copy of these adverts.

### *3.i.vi Document Review*

All registered stakeholders were informed of the availability of the draft Basic Assessment Report (BAR) on 12 April 2023 for the opportunity to review this document. The draft BAR was made available to stakeholders from 11 April 2023 to 10 May 2023 for review.

### *3.i.vii Stakeholder Meeting*

Due to the nature of the project and outcomes of the current consultation process to date, no stakeholder meeting is currently planned, but will be considered when required.

### *3.i.viii Summary of Issues raised by the I&APs*

To date the following comments have been received.

Table 11: Stakeholder Comments received

No.	Theme: General Comments / Issues			
	Issue Raised	Date and How Issue Was Raised	Commentator	Response
1	Stakeholder provided Company Profile and Medical Exist Certificate	Email 15 March 2023	Magapane Masha	<p>EnviroGistics was appointed by Dwarsrivier Mine as independent Environmental Consultants, for the Environmental Authorisation Process.</p> <p>It unfortunately falls outside of our mandate to set up appointments between third parties and Dwarsrivier Mine or to become involved in procurement or other internal appointment processes at the mine, as such engagements do not fall within the scope of the project and may jeopardise our independence. As independent consultants we cannot bypass the Dwarsrivier Mine's internal and external procurement processes. For this reason, we could only provide you with the governance process, available to us, as implemented by Dwarsrivier Mine relating to any procurement processes. We recommend that you access the supplier portal through the processes as forwarded to you yesterday and as prescribed by Dwarsrivier Mine.</p> <p>For any information on the Basic Assessment process and associated public participation in relation to this, you are welcome to contact us.</p>
2	Protected Trees in the area (National Forest Act, 1998); prevention of veld fires and the response when veld fires break out.	Email, 17 March 2023	DFFE, Ms. Tshifiwa Mathase	No illicit fires must be allowed during the construction of the proposed development. The mine has a detailed induction programme in which this is clearly addressed.
3	<p>De Groote Boom Minerals (Pty) Ltd owns the mine (De Groote Boom Mine) on the properties adjacent (leased Portion of the Remainder of Portion 7 of the Farm De Grooteboom 373KT and Portion 10 of the Farm De Grooteboom 373KT) to the Farm Dwarsrivier 372KT where this proposed project is taking place.</p> <p>During construction and operation there may be increased dust generation that could impact the air quality in the area. Further, if</p>	Email, 16 March 2023	De Groote Boom Minerals (Pty), Mr. Henk Moen	The comments are noted and will be addressed in the assessment. Note that no groundwater study will be undertaken as part of this project, as the project will not impact on groundwater resources. The project involves the implementation of clean and dirty water systems.

No.	Theme: General Comments / Issues			
	Issue Raised	Date and How Issue Was Raised	Commentator	Response
	<p>the stormwater infrastructure involved with this project is not constructed to engineering specifications it could pollute the Springkaanspruit and the Groot Dwarsrivier which will impact the surface and possibly groundwater resources in the area.</p> <p>Please provide Stormwater management plan, groundwater impact assessment, and air quality impact assessment and dust suppression methods.</p>			
4	<p>Consider that the channel will be on the graveyard site and other cultural aspects. My point of concern is to be considered and the issue of unemployment to the society. I support the project.</p>	<p>Email, dated 30 March 2023</p>	<p>Mrs. Tutu Mmadi</p>	<p>Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the Projects and the study area was assessed on a desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:</p> <ul style="list-style-type: none"> <li>☞ The study area is characterised by extensive mining activities that transformed the Project footprint and the development footprint is considered to be of low heritage potential;</li> <li>☞ This was confirmed during the survey that recorded no heritage resources in the Project area although several heritage sites are known to occur in the DCM surface rights boundary ranging from burial sites and intangible heritage sites to artefacts and sites dating to the Stone Age and Iron Age;</li> <li>☞ None of the known sites will be affected by the Projects;</li> <li>☞ The study area is of insignificant and low paleontological sensitivity and no further studies are required for this aspect.</li> </ul> <p>Please also refer to Annexure 3 for the specialist report compiled by Beyond Heritage.</p>

### 3.i.x The Environmental Attributes associated with the Alternatives

In order to provide an overall environmental understanding of this site, a general presentation of all environmental parameters is provided.

#### 3.i.x.1 Baseline Information

##### 3.i.x.1.a Climate

###### 3.i.x.1.a.1 Temperature

Dwarsrivier Mine is situated in the Highveld Climate Region of South Africa. The average daily maximum temperature for summer (January) is 27 degrees Celsius (°C) and for winter 17°C. The average daily minimum temperatures vary between 13°C in January and 0°C in July.

###### 3.i.x.1.a.2 Rainfall

The proposed project falls within quaternary catchment B41G. The monthly rainfall for this catchment was obtained from the Water Resources of South Africa Study 2012 and is indicated Table 12. The Mean Annual Precipitation (MAP) for the area is 650mm, with the wettest months occurring from November to January, and the driest months from June to August.

Table 12: Monthly rainfall for quaternary catchment B41G (green highlights driest months)

Month	Monthly Rainfall (mm)
January	111.5
February	88.3
March	75.5
April	41.8
May	14.8
June	6.2
July	5.2
August	5.8
September	20.6
October	60.0
November	111.7
December	108.7
<b>TOTAL</b>	<b>650</b>

###### 3.i.x.1.a.3 Evaporation

The table below summarises all the different evaporation figures for the site.

Table 13: Evaporation Summary

Month	Symonds Pan Evaporation (mm)	Evaporation Factor	Open Water Evaporation (mm)
January	165.0	0.84	138.6
February	137.6	0.88	121.0
March	135.8	0.88	119.5
April	104.4	0.88	91.9
May	87.9	0.87	76.5
June	71.4	0.85	60.7
July	78.2	0.83	64.9
August	103.5	0.81	83.8
September	134.1	0.81	108.6
October	161.7	0.81	131.0
November	152.6	0.82	125.1
December	168.0	0.83	139.4
<b>TOTAL</b>	<b>1500</b>	<b>N/A</b>	<b>1261</b>



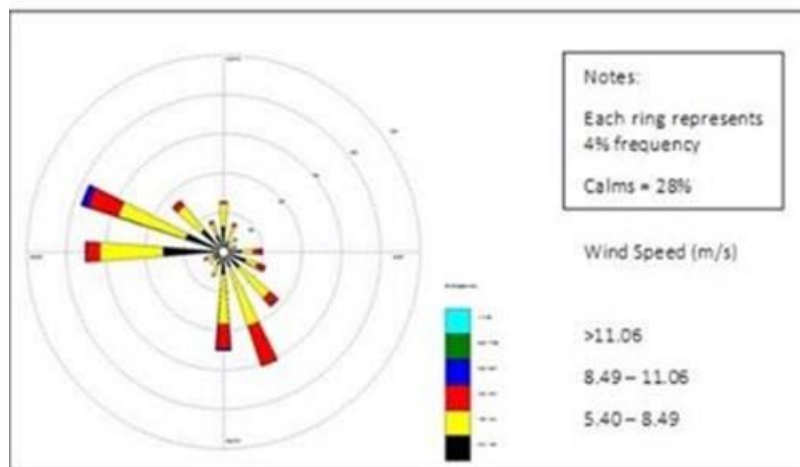
The MAP is less than the Mean Annual Evaporation (MAE) and therefore the site is classified as a water deficit site, when considering the following table:

Table 14: Natural Water Balance (rainfall vs. evaporation)

Month	Rainfall	Open Water Evaporation (mm)	Difference
January	111,50	138,60	-27,1
February	88,30	121,00	-32,7
March	75,50	119,50	-44
April	41,80	91,90	-50,1
May	14,80	76,50	-61,7
June	6,20	60,70	-54,5
July	5,20	64,90	-59,7
August	5,80	83,80	-78
September	20,60	108,60	-88
October	60,00	131,00	-71
November	111,70	125,10	-13,4
December	108,70	139,40	-30,7
<b>TOTAL</b>	<b>650,00</b>	<b>1261,00</b>	<b>-611</b>

3.i.x.1.a.4 Wind

Wind can play an important role in the potential distribution of fugitive dust resulting from the site. As the mine is situated in the Dwarsrivier valley, this factor gives rise to winds that are variable in terms of both speed and direction. The wind rose of the closest weather station recording wind is Lydenburg (W0554816) is presented in the figure hereafter. According to this information the dominant winds are south-easterly and north-westerly winds.



Graph 1: Wind data.

3.i.x.1.a.5 Extreme Weather Conditions

The incidents of extreme weather conditions for this area are included in the following table.

Table 15: Extreme Weather Conditions.

# of Days With	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Days Per Year
<b>Thunder</b>	6.	4.4	3.7	2.7	0.9	0.5	0.4	1.1	1.4	4.1	7.1	5.1	37.6
<b>Hail</b>	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.5	0.2	1.9
<b>Fog</b>	1.9	1.3	1.1	0.9	0.4	1.1	0.8	1.1	0.8	2.6	1.6	1.6	15.2
<b>Snow</b>	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.6

### 3.i.x.1.b Topography

The farm Dwarsrivier 372KT, on which the mine is located, is traversed by the Dwars River and the Klein Dwars River. The confluence of these rivers is also located on the property. The eastern portion of the property, where the chrome reserves outcrop, generally slopes in a westerly to south westerly direction, towards the Dwars River. Adjacent to the river, slopes are gentle, in the order of 3°. Further upslope from the river, slope angles increase to as much as 40°.

However, the slopes are not always gradual with frequent small to relatively large koppies or hills formed from more resistant materials. Elevations on the farm Dwarsrivier 372KT vary from 900 – 1,200 m. The area generally drains in a northerly direction, via the Dwars River and Klein Dwars River. There are, however, a number of small westerly flowing, non-perennial tributaries of the Dwarsrivier in the vicinity of the old open cast sections. There is approximately 40m elevation change across the mine site, with elevations between 940 – 975 metres above mean sea level (mamsl).

The area associated with the storm water channel is characterised by an gradual decreasing slope towards the south – i.e. in the direction of the Springkaanspruit (elevation of 963mamsl on the north to 962mamsl on the south– less than a 1m difference). Please refer to the following figure for the elevation profile.

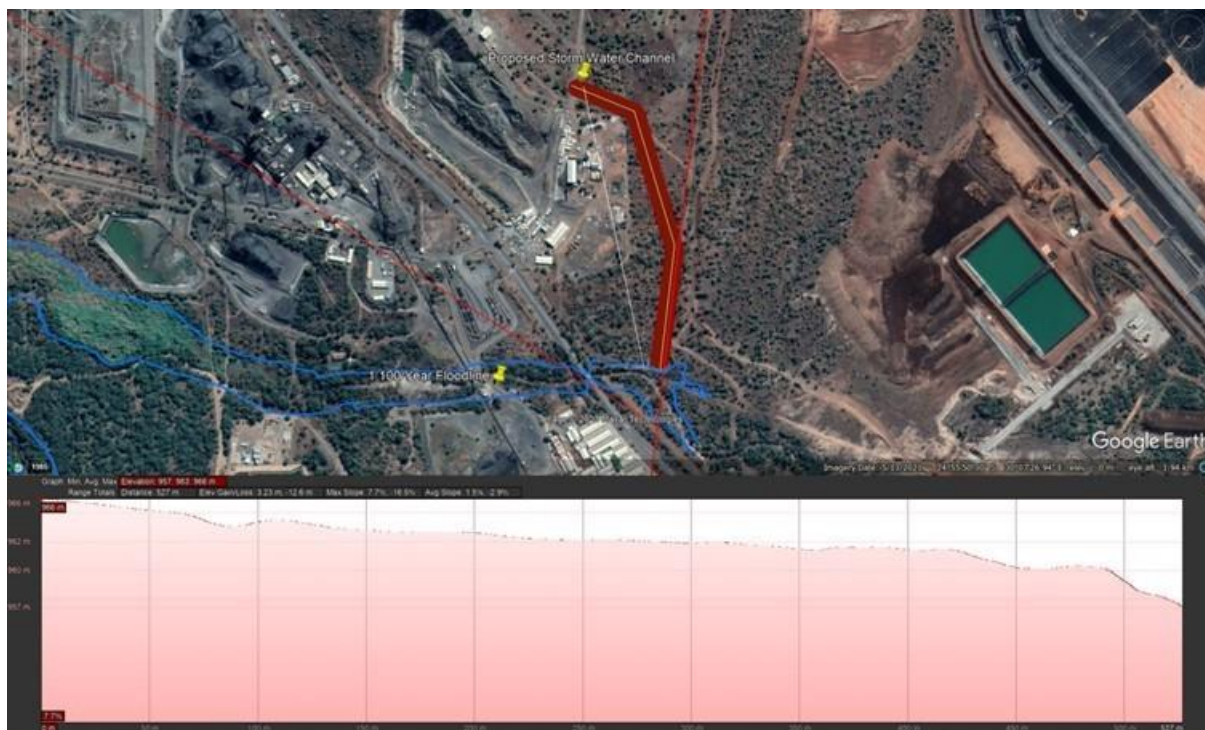


Figure 7: Proposed Project Area elevation profile from north to south

### 3.i.x.1.c Geology

Dwarsrivier Mine is situated in the eastern limb of the 2052 Ma (million year old) Bushveld Igneous Complex, the world’s largest layered intrusion, comprising the emplacement of at least 7 x 10<sup>5</sup> cubic kilometres (km<sup>3</sup>) of magma into the sediments of the Transvaal Supergroup. The chrome ore deposits form part of the Critical Zone of the Bushveld Complex. The chrome horizon that gets mined is referred to as the LG 6 (Lower Group 6) horizon. The chrome layer is overlain by anorthosite and pyroxenite. The layers have a regional dip of 13° west in this area, towards the centre of the Bushveld Igneous Complex. However, local variations in dip are common.

The Dwarsrivier ore body represents an open-ended structural synform, with a north-south orientated axis that plunges gently to the south. The mine is situated on the eastern limb of this synform. The geology overlying the chromite generally comprises pyroxenite and Norite and Gabbro, with the project area located in an area underlain by Norite.

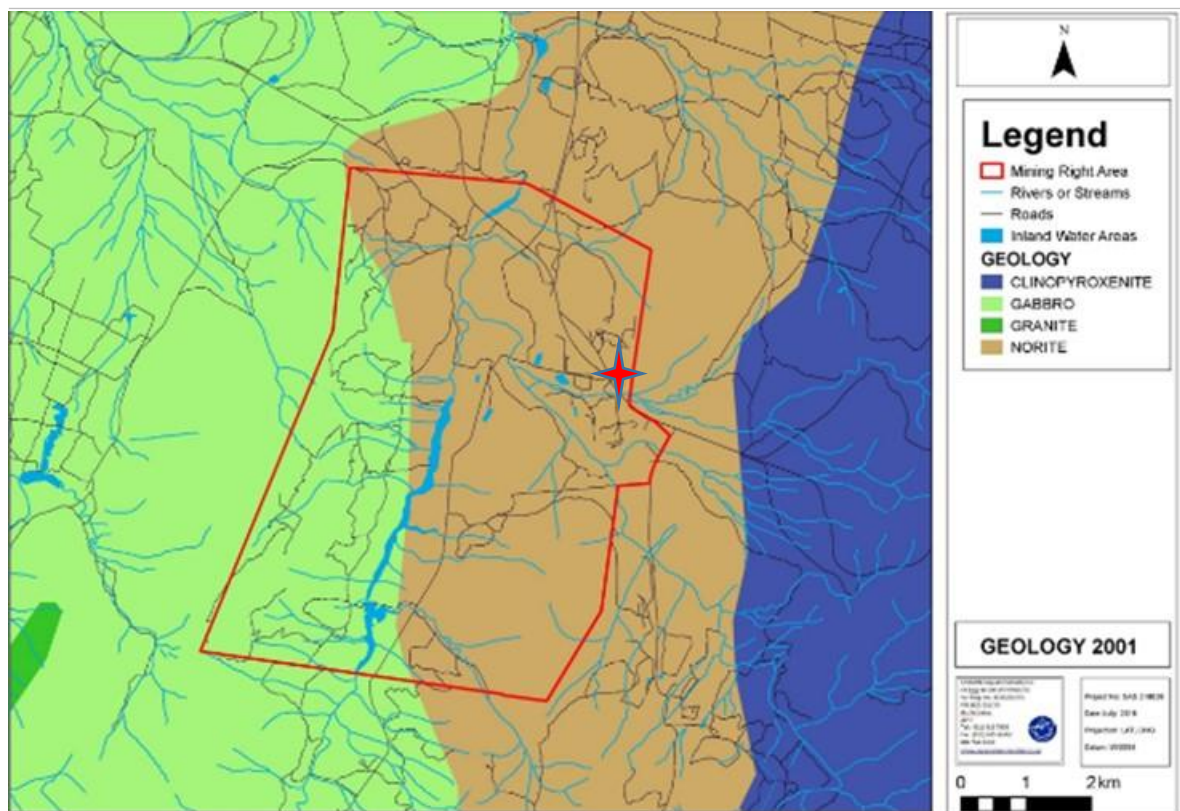


Figure 8: Geology (the project area is indicated with a star)

### 3.i.x.1.d Soils

#### 3.i.x.1.d.1 General Description

According to the soil-terrain (SOTER) database and the 1:250 000 geological map of South Africa, the majority of the study area is underlain by pyroxenite rock formations (parent material) while the remaining portions are underlain by gabbro (Figure 9). The SOTER database indicates that the majority of the study area comprises strongly weathered acid soils with low base saturation, classified as Luvisols (LVk) with the remaining portions classified as Lithic Leptosols (LPq).

The area is dominated by shallow soils of Mispah/Outcrop and Glenrosa/Mayo/Mispah forms which collectively constitute of approximately 71.41% of the total investigated area, whilst arable soils of Hutton and Bonheim occupies approximately 1.55% of the total investigated area. The shallow nature of the dominant soil forms can be largely attributed to limited rock weathering or rejuvenation through natural erosion on steeper, convex slopes.

Table 16: Soils forms within the 2018 Environmental Impact Assessment study area

Soil Form	Total Area (Ha)	% Areal Extent
Hutton	3.16	0.09
Bonheim	51.80	1.46
Acardia	126.54	3.58
Rensburg and Alluvial soils	198.45	5.61
Glenrosa/Mayo/Mispah	1217.40	34.41
Brandvlei/Etosh/Gamoep	247.39	6.99
Mispah/Outcrop	1308.90	37.00
Mining and Infrastructure (Including roads and water dam)	97.59	2.76
Witbank (anthrosols)	286.33	8.09
<b>Total Area Investigated</b>	<b>3537.60</b>	<b>100</b>

The remainder of the area is occupied by Acardia, Brandvlei/Etosh/Gamoep soil forms, mining and associated structures (i.e. mine plant complex, stockpile areas, Return Water Dams, office areas and tar roads), Witbank (anthrosols) soil forms, as well as soil forms which are associated with freshwater features such as Rensburg and Alluvial soils. The Witbank soils have been extensively disturbed such that no recognisable diagnostic soil

morphological characteristics could be identified, corresponding to anthrosols in the international soil classification terminology.

The Glenrosa and Mispah soil forms are generally less than 0.3m deep, but may be as much as 0.6m deep. The Hutton Form soil forms are generally in excess of 0.60m deep to as deep as 1.50m, but shallower examples occur, especially adjacent to the Glenrosa soils.

Please refer to Figure 11 for the soil forms identified within the Mining Right Area.

The findings of this assessment suggest that the proposed project area is mainly confined to the Glenrosa/Mayo/Mispah and Witbank soil forms (see Figure 12) and that the relevant soil limiting factors within the area for land capability and land use potential include the following:

- ☛ Shallow effective rooting depth due to shallow indurated bedrock of the Mispah, Glenrosa, Mayo soil forms. As such, these soils are not considered to contribute significantly to agricultural productivity;
- ☛ Lack of soil medium for plants and crop growth exists within the rocky outcrop, mine infrastructure, surface water areas and Witbank (anthrosols) soil types.

#### 3.i.x.1.d.2 Land Use and Capability

Current land use activities associated with the larger region are generally dominated by wildlife and wilderness, in addition to intensive underground mining operations. Fallow lands were also identified on the north central portion of the area and are occasionally used for grazing. No current agricultural activities were observed within the proposed project areas and surround.

The identified soils were classified into land capability classes using the Scotney *et al.* 1987) Land Capability Classification system, as presented in Figure 10. The soils associated with the project are associated with parent material of pyroxenites. The land capability in terms of 2018 Specialist studies indicated the area as moderate potential arable land – however this area is within a mining right area.



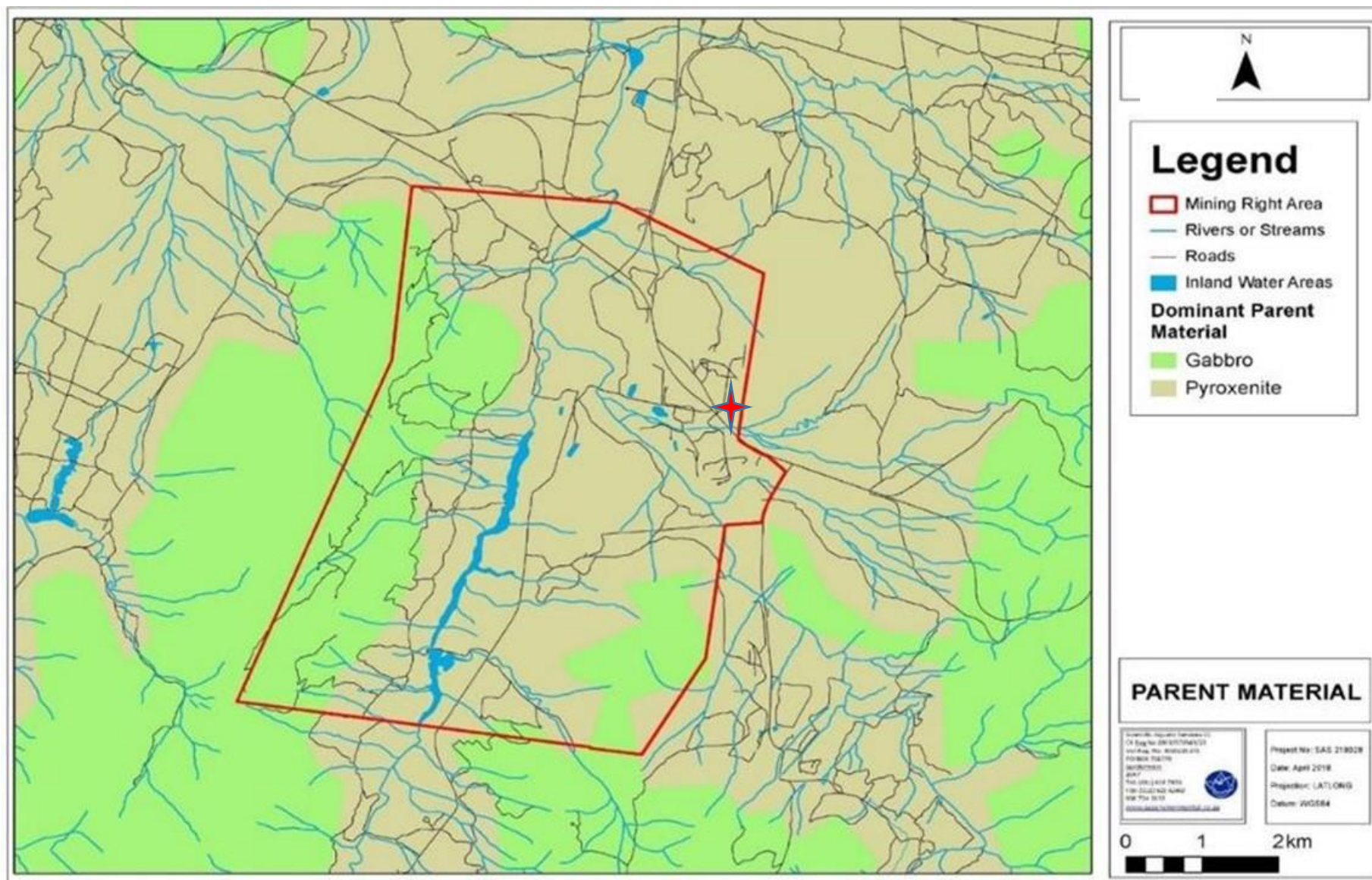


Figure 9: Parent material associated with the Mining Right Area and surrounding areas according to the SOTER Database (star indicating proposed project area)



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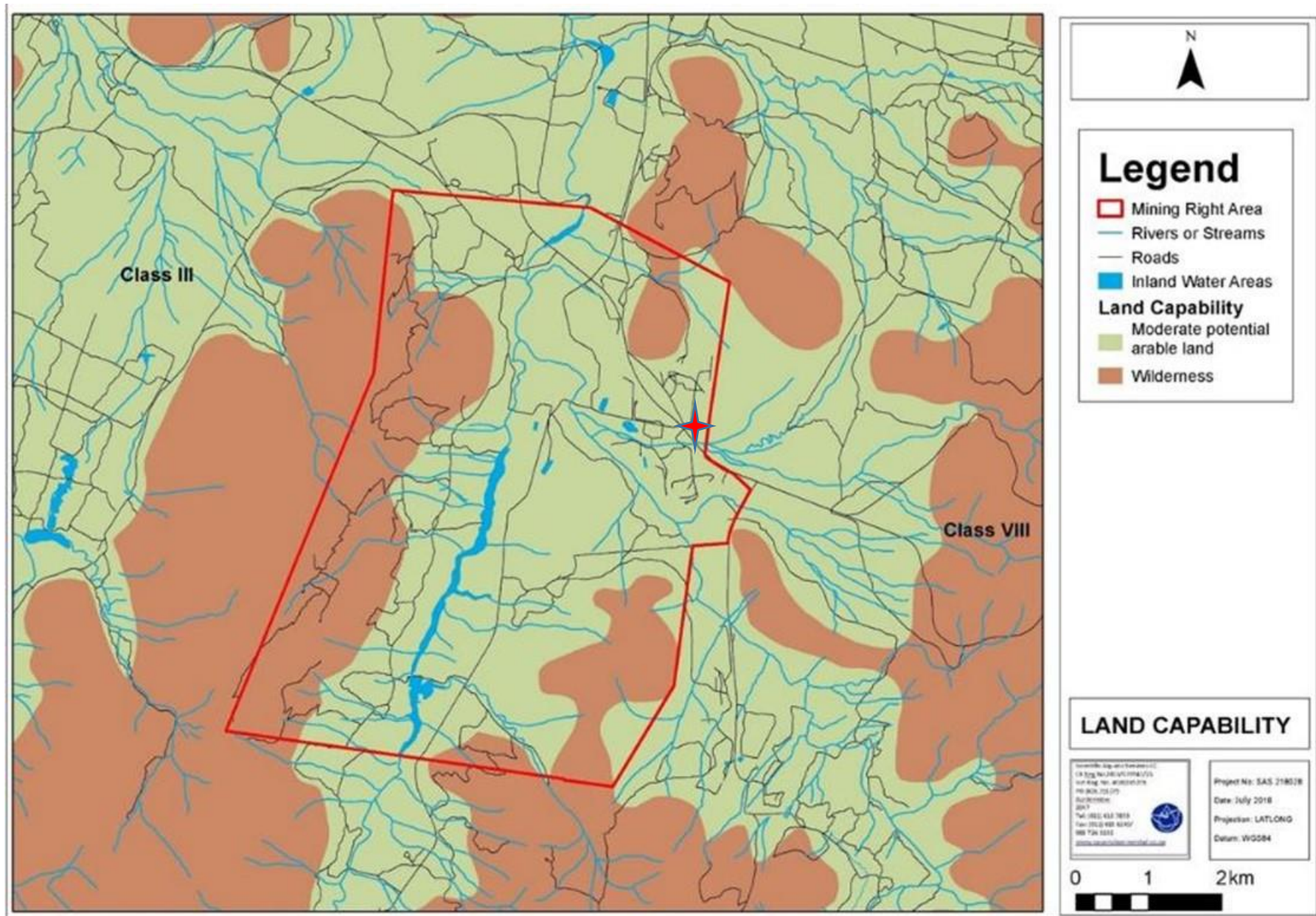


Figure 10: Land Capability Map (star indicating proposed project area)



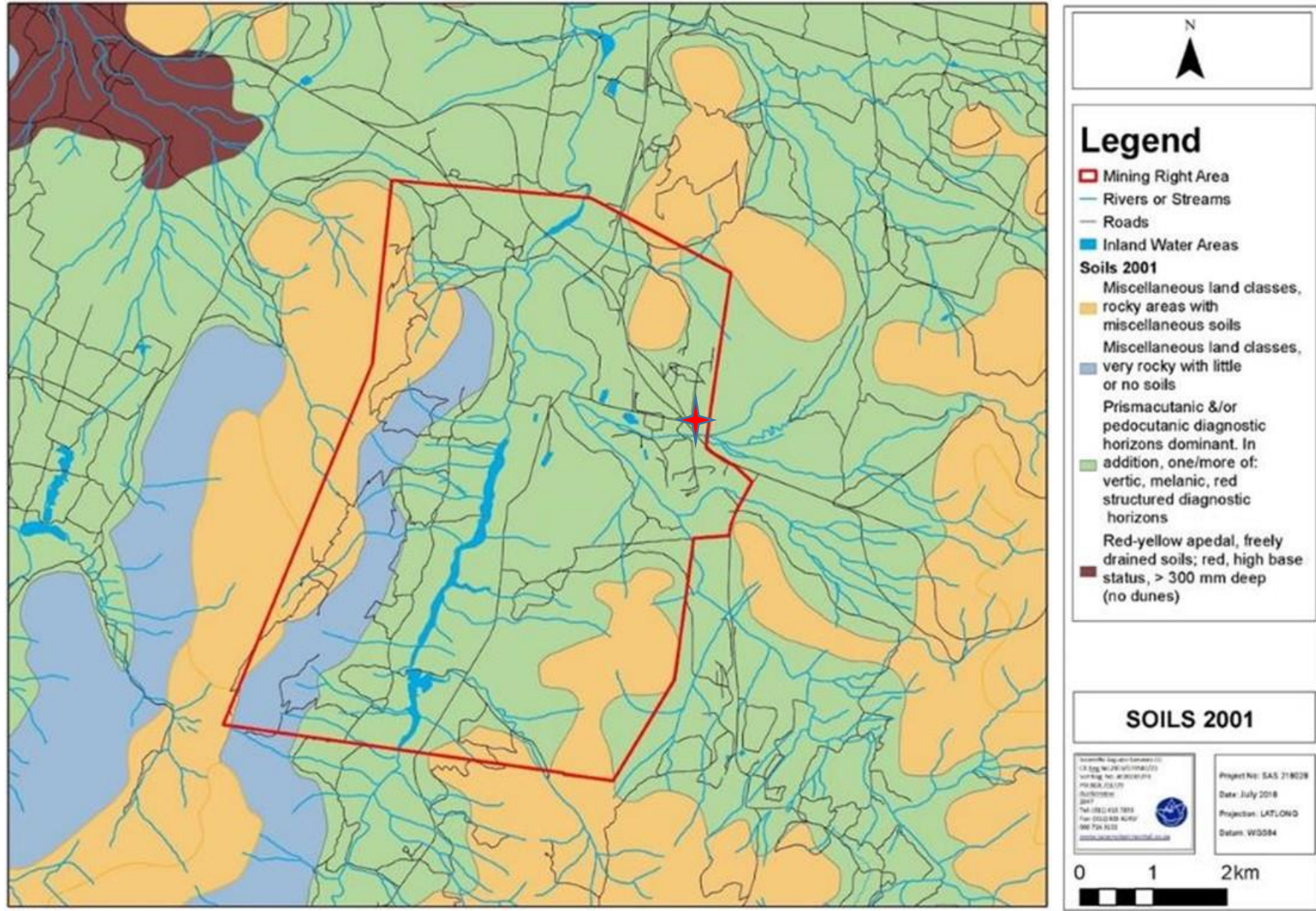


Figure 11: Soils, 2001 (SAS, 2018) (star indicating proposed project area)



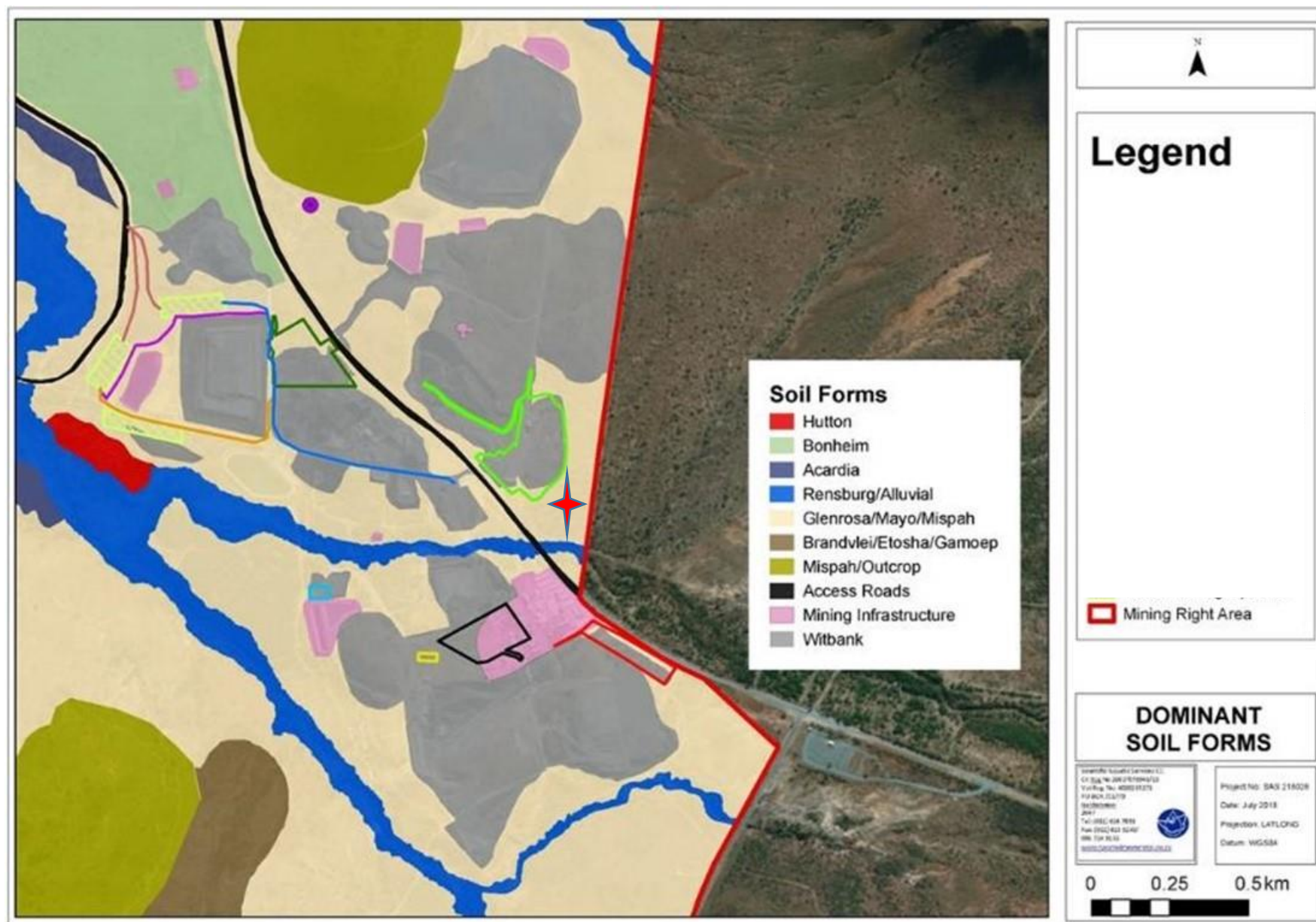


Figure 12: Soil map depicting identified soil forms associated with the infrastructural developments assessed during 2018 (SAS, 2018) (star indicating proposed project area)



### 3.i.x.1.e Ecological Footprint

The project area is located in the Savanna Biome, within the Central Bushveld Bioregion (please refer to Figure 13 for the high level habitat units of the area) and is also situated within the Sekhukhuneland Centre of Plant Endemism. The Dwarsrivier Mine Mining Right Area is located within an area that is not currently protected. The project area is however located within the Sekhukhune Mountainlands, which was previously regulated as a threatened ecosystem, and was considered Endangered (Figure 14). This classification was however amended during 2022 and this ecosystem is no longer included onto the Threatened Ecosystem List.

Key biodiversity features within this ecosystem include 19 plant species, including for example *Aloe fouriei*, *Gladiolus rufomarginatus*, *Lydenburgia cassinioides*, *Resnova megaphylla*, *Merwillia plumbea* and *Zantedeschia pentlandii*. Five vegetation types including the Sekhukhune Montane Grassland, the Sekhukhune Mountain Bushveld, the Steenkampsberg Montane Grassland, the Lydenburg Thornveld, and the Ohrigstad Mountain Bushveld are located within the Sekhukhune Mountainlands ecosystem. The ecosystem forms part of the Sekhukhuneland Centre of Endemism; it includes important sub catchments, pans and wetlands and is important for grassland processes.

Broadly, the vegetation and landscape features associated with Dwarsrivier Mine are considered to comprise dry, open to closed microphyllous and broad-leaved savanna on hills and mountain slopes that form concentric belts parallel to the north-eastern escarpment. Open bushveld within the region is often associated with ultramafic soils on southern aspects, with bushveld vegetation on these soils typically containing a high diversity of edaphic specialists, while Bushveld vegetation on mountain slopes tend to be generally taller than in the valleys, with a well-developed herb layer. Bushveld within valleys and located on dry northern aspects usually form dense thicket, with an herb layer comprising many short-lived perennials. Dry habitats contain a number of species with xerophytic adaptations, such as succulence and underground storage organs. Both man-made and natural erosion dongas occur on foot slopes of clays rich in heavy metals.

The Screening Tool indicated that the proposed development is located (1) within an area of medium sensitivity from an Animal Species Theme, (2) within an area of low and medium sensitivity from a Plant Species Theme, and (3) within an area of very high sensitivity from a Terrestrial Biodiversity Theme.

According to the South African Protected Area Database (SAPAD, 2022) the mine is located approximately 8km east of the De Hoop Private Nature Reserve (PNR), approximately 9km southwest of the Berghoek PNR, and 11.6km of the Steelpoort PNR (Figure 15). The National Protected Areas Expansion Strategy (NPAES, 2018) database indicates the Mpumalanga Mesic Grasslands Focus Area to be situated within the south-eastern corner of the Mining Right Area (Figure 15).

In terms of the Mining and Biodiversity Guidelines (2013), it should be noted that the majority of the Mining Right Area, with the exception of a small area within the northern portion of the mine falls within an area considered to be of Highest Biodiversity Importance (Figure 16), which includes the proposed project area. Highest Biodiversity Importance areas include areas where mining is not legally prohibited, but where there is a very high risk, that due to the potential biodiversity significance and importance of these areas to ecosystem services (e.g. water flow regulation and water provisioning), that mining projects will be significantly constrained or may not receive necessary authorisations.

The Limpopo C-Plan (2018 dataset) indicates that most of the proposed channel is located within a Critical Biodiversity Area 1 (CBA 1). A small section, associated with the northwest section of the trench, is located within areas identified as No Natural Remaining (NNR) areas. (Figure 17).

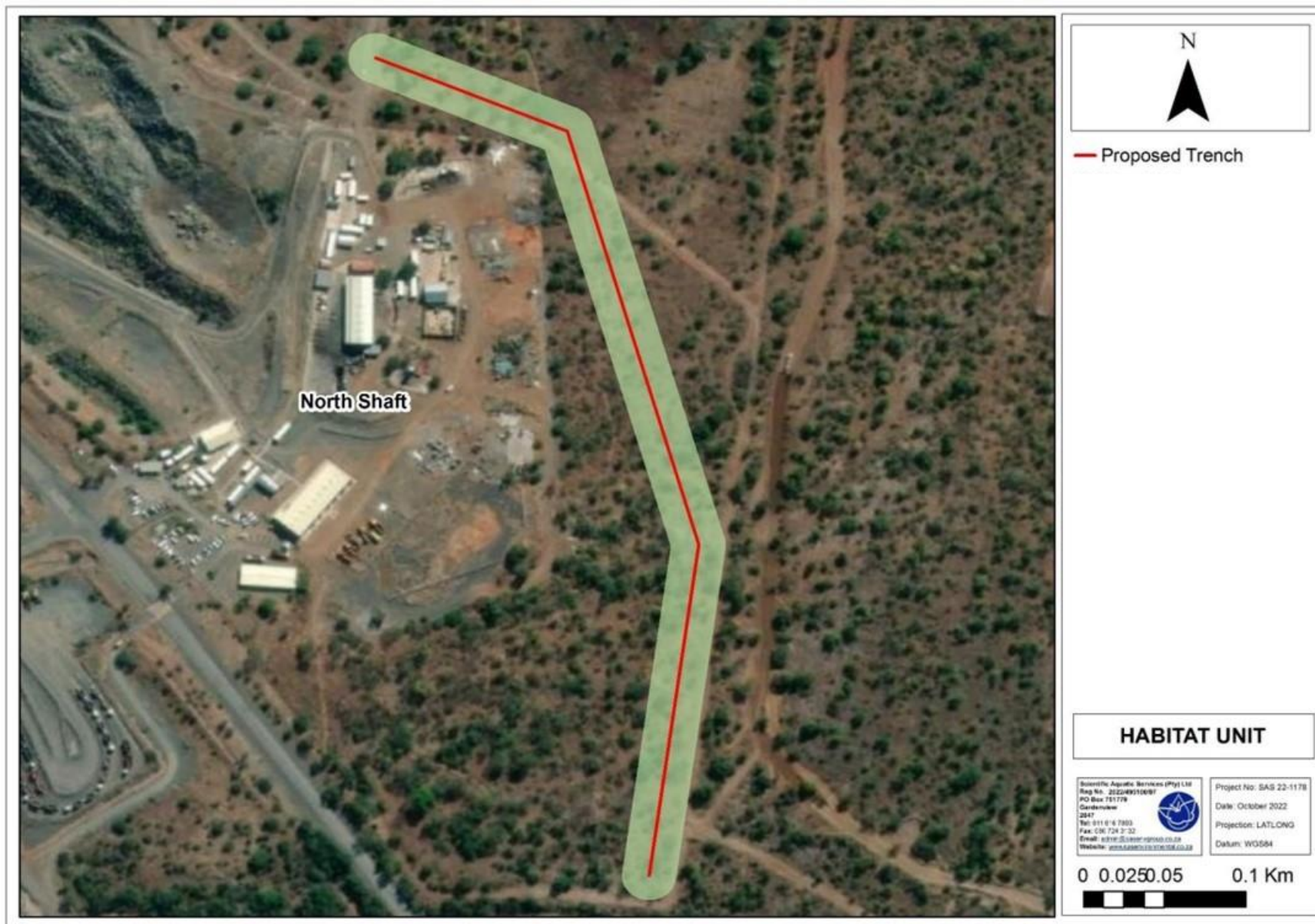


Figure 13: Illustrative representation of high level habitat units associated with the project





Figure 14: Sekhukhune Mountainlands Ecosystem (indicated in green) associated with the Dwarsrivier Mine Mining Right Area – note that this ecosystem has been removed from the Threatened Database



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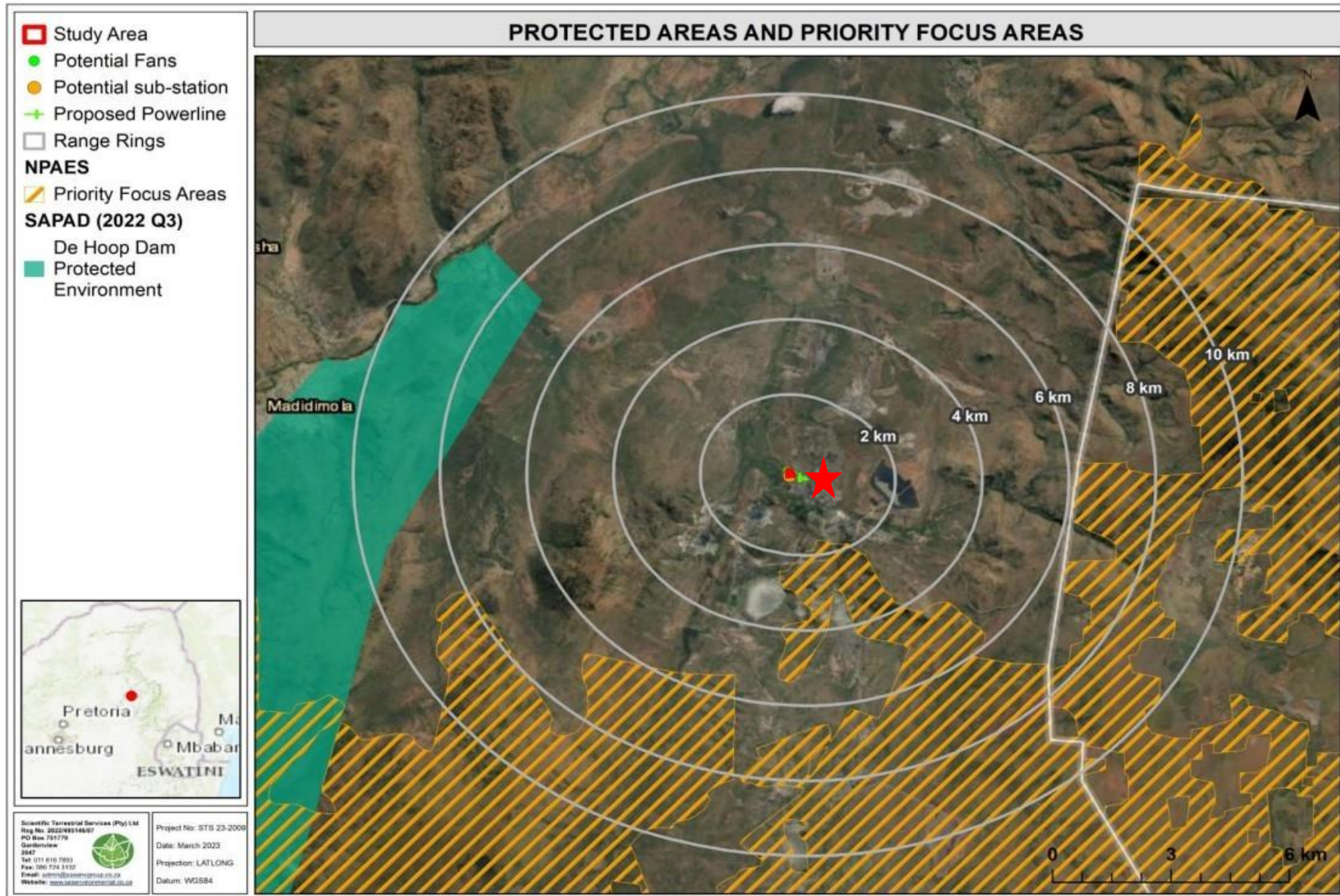


Figure 15: NPAES Focus Areas associated with the Dwarsrivier Mine Mining Right Area, as well as Protected Areas in close proximity (SAPAD, 2022 and NPAES, 2018) (SAS, 2023)



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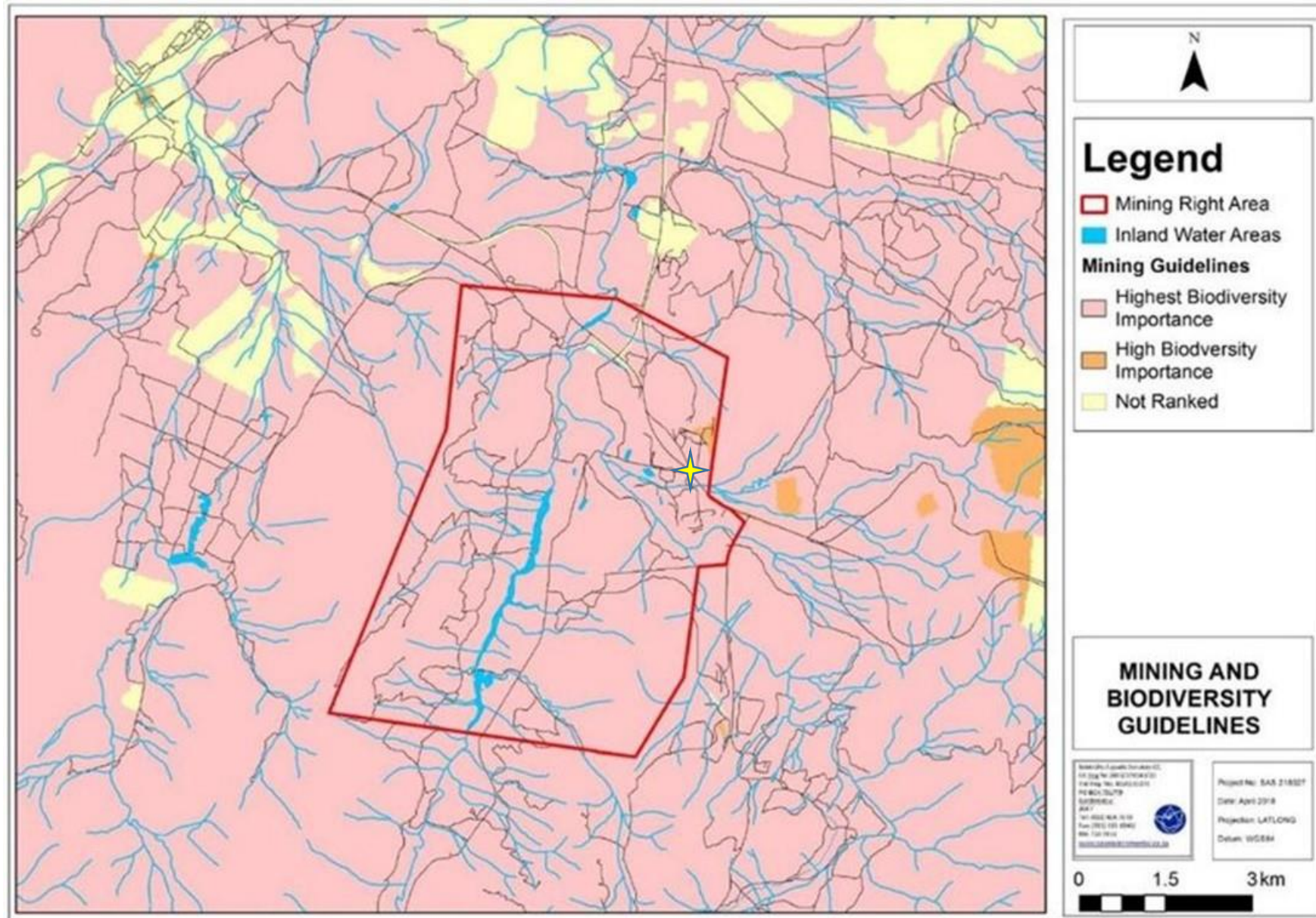


Figure 16: Importance of the area according to the Mining and Biodiversity Guidelines (2013) (SAS, 2018) (star indicating proposed project area)



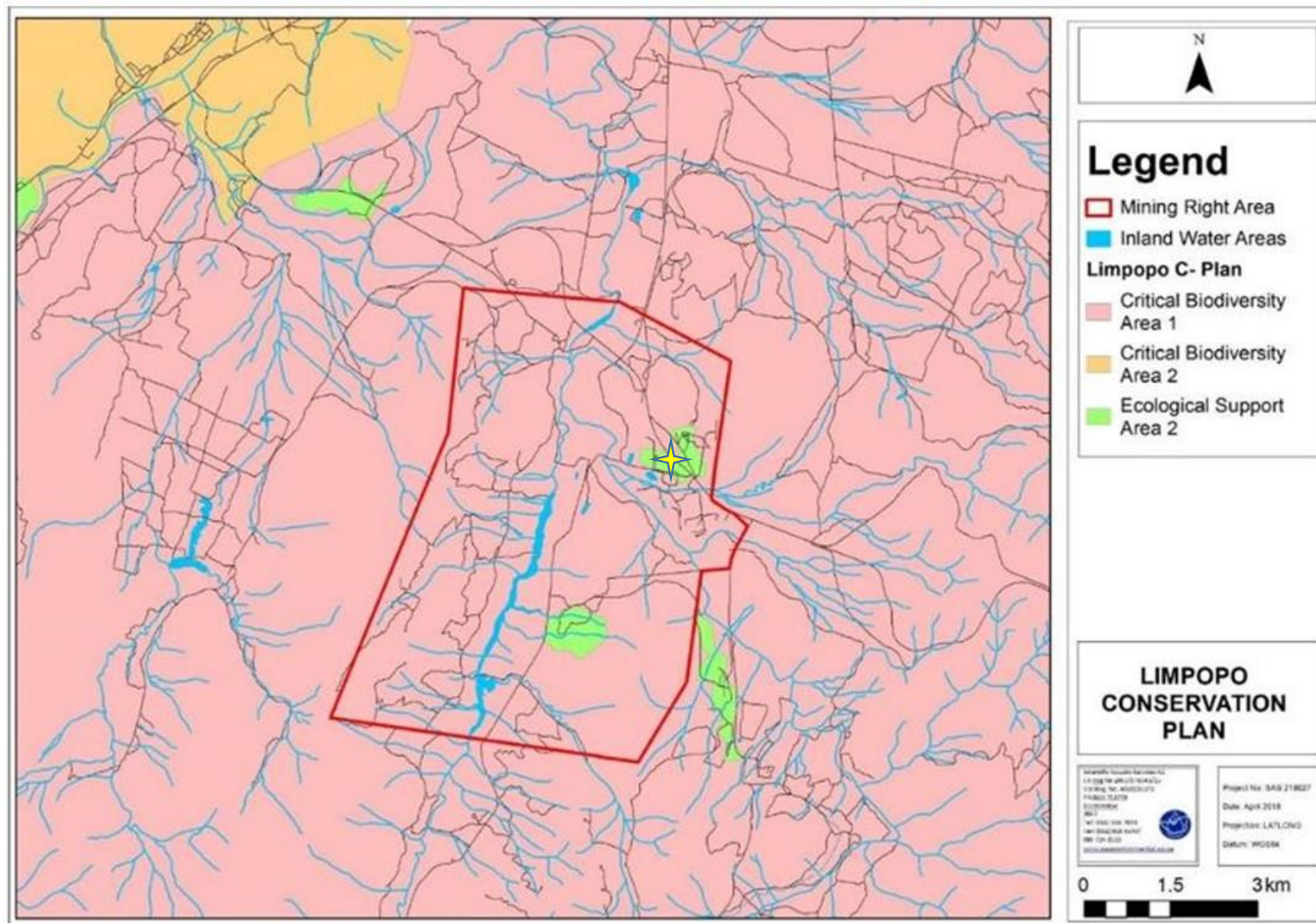


Figure 17: CBA 1 and ESA 2 associated with the area (SAS, 2018) (star indicating proposed project area)

Although the habitat has experienced some degradation from nearby mining activities and associated edge effects (e.g. AIP proliferation, fragmentation, etc), the Mixed Bushveld Habitat is considered to be largely representative of the Sekhukhune Mountain Bushveld. Furthermore, the Mixed Bushveld habitat provides suitable habitat for several protected SCC as well as endemic species that are characteristic of the ecosystem (e.g., *Aloe castanea*, *Aloe cryptopoda*, *Elephantorrhiza praetermissa*, and *Triaspis glaucophylla*).

Note that the Sekhukhune Mountainlands ecosystem previously was considered as a National Threatened Ecosystem. This has however been removed in the 2022 amended Regulations.

The Mixed Bushveld Habitat is of intermediate floral sensitivity. This sensitivity was achieved based on the following:

- ☛ Suitable habitat for an intermediate diversity of floral species of conservation importance is available within the Mixed Bushveld Habitat. Potential species of conservation importance include threatened species, nationally protected species as per the National Forest Act, 1998 (Act No. 84 of 1998) (NFA), threatened or protected species (TOPS) as per the 2007 regulations (amended 2023), and/or provincially protected species in terms of the Limpopo Environmental Management Act, 2003 (Act No.7 of 2003) [LEMA]). It should be noted that during the field assessment conducted during August 2022 (which focused on identifying, marking and characterising NFA protected *Sclerocarya birrea* subsp. *caffra* individuals in the surrounding areas were not recorded within this footprint area. It would however be recommended that a walkdown of the project area be conducted prior to any vegetation clearing to ensure no other species of conservation importance (e.g. LEMA protected, TOPS and/or RDL species) are located within the development footprint;
- ☛ An intermediate floral diversity was recorded within the habitat. The Mixed Bushveld floral communities present within the channel upgrade footprint area are considered to be similar to those expected within the reference Sekhukhune Mountain Bushveld vegetation type. Although some variation in species composition has occurred (due to degradation and edge effects), the Mixed Bushveld Habitat is considered to be representative of the reference vegetation type in terms of overall species composition and structure;
- ☛ The habitat has an intermediate conservation status (based on the location of the habitat within an area previously considered to form part of an Endangered ecosystem);
- ☛ The Mixed Bushveld had a moderate habitat integrity since the Mixed Bushveld habitat within the channel footprint area has been subject to edge effects (e.g., AIP species proliferation, fragmentation, etc), which have subsequently impacted on the overall integrity of the habitat; and
- ☛ The Mixed Bushveld habitat provides unique landscape (e.g., lower lying mountainous regions). As such, the overall sensitivity of the habitat is considered to be intermediate.

#### 3.i.x.1.f Hydrological Setting

The mine is located in WMA 4: Olifants and the greater part of the mine falls within Quaternary Catchment B41G.

Three primary drainage systems, along with their respective tributaries and smaller ephemeral drainage lines, were identified within the Mining Right Area, namely, the Klein Dwars River and Groot Dwars River, which confluence approximately 1.8km south of the northern boundary of the Mining Right Area to form the Dwars River. In addition to these primary systems, several tributaries of each of these systems were identified: the Springkaanspruit and an unnamed tributary draining into the Groot Dwars River from the northeast and southeast respectively, an unnamed tributary of the Dwars River in the north, and a non-perennial unnamed tributary of the Klein Dwars River in the south. Numerous ephemeral drainage lines with riparian vegetation were also identified draining into the Klein Dwars River.

The non-perennial stream which has been diverted in the past for the purposes of the opencast operations, drains into the Klein Dwars River, which has its confluence with the Tubatse (Steelpoort) River about 10km downstream of the mine. The Steelpoort River joins the Olifants River approximately 60km to the north.

The Groot Dwars River has its origin on the farm De Berg 71JT some 33.75km (measured in a straight line) to the south of the confluence of the Groot Dwars River with the Klein Dwars River. The Klein Dwars River has its origin on the farm, Uysedoorns 47JT, approximately 25.3km (measured in a straight line) to the south of this river's confluence with the Groot Dwars River. The Springkaanspruit enters the Groot Dwars River from the east some 1.6km upstream from the confluence of the Groot- and Klein Dwars Rivers, and has its origin on the watershed



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between the farms Zwakwater 377KT and Schuins 378KT, some 15.4km (measured along its longest collector) to the east of its confluence with the Groot Dwars River.

The closest river systems to the project in question are the:

- Springkaanspruit: about 35m to the south; and
- Groot Dwarsrivier: about 1km to the south.

The site is drained in a south-westerly direction towards the Springkaanspruit. It is considered that the Springkaanspruit will be the only river which could be impacted upon by the development as it is the closest to the proposed site.

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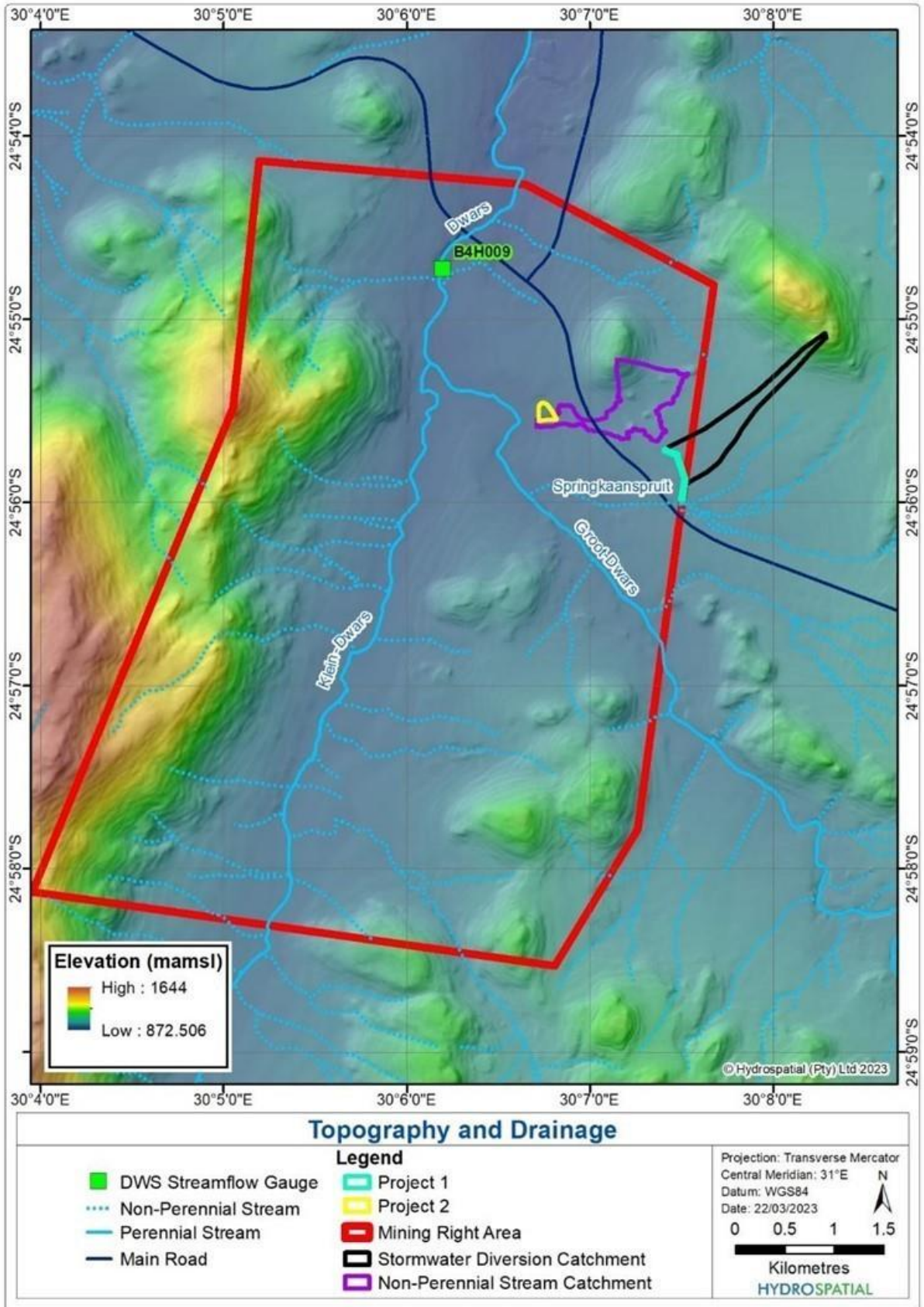


Figure 18: Topography and Drainage associated with Project 1 (Storm Water Management Channel)





Figure 19: Site Specific Topography and Drainage

3.i.x.1.g Hydrogeological Setting

There are three main aquifers found in the area (Irene Lea Environmental and Hydrology cc (iLEH), 2017). These include:

- 
- A shallow weathered aquifer present in the upper 20m of the geological succession.
  - A fractured rock aquifer consisting of fractured pyroxenites, anorthosites and norites. The depth to weathering in this aquifer varies from 0 – 32m, but is on average 8 – 10m below surface. Pockets of deeper weathering are associated with faulting and/or jointing. The intersection of fractures in exploration boreholes suggests that the majority of fractures occur within the upper 60m of the geological succession. Deeper fracturing is however found to a depth of 200m. Information from monitoring boreholes suggests that water-bearing fractures typically occur to a depth of 40m. For the purpose of this study, the floor of the LG6 chromitite seam will be assumed as the depth of the fractured rock aquifer.
  - An alluvial aquifer present in the floodplains of the Groot- and Klein Dwars Rivers. In this aquifer, the lithology varies from large boulders to fine silty material. Monitoring boreholes drilled into this aquifer suggests that it is 20m thick on average.

Dwarsrivier Mine monitors 17 boreholes around the operations.

Groundwater is used as water supply to the operations. No additional water supply will be required for this project.



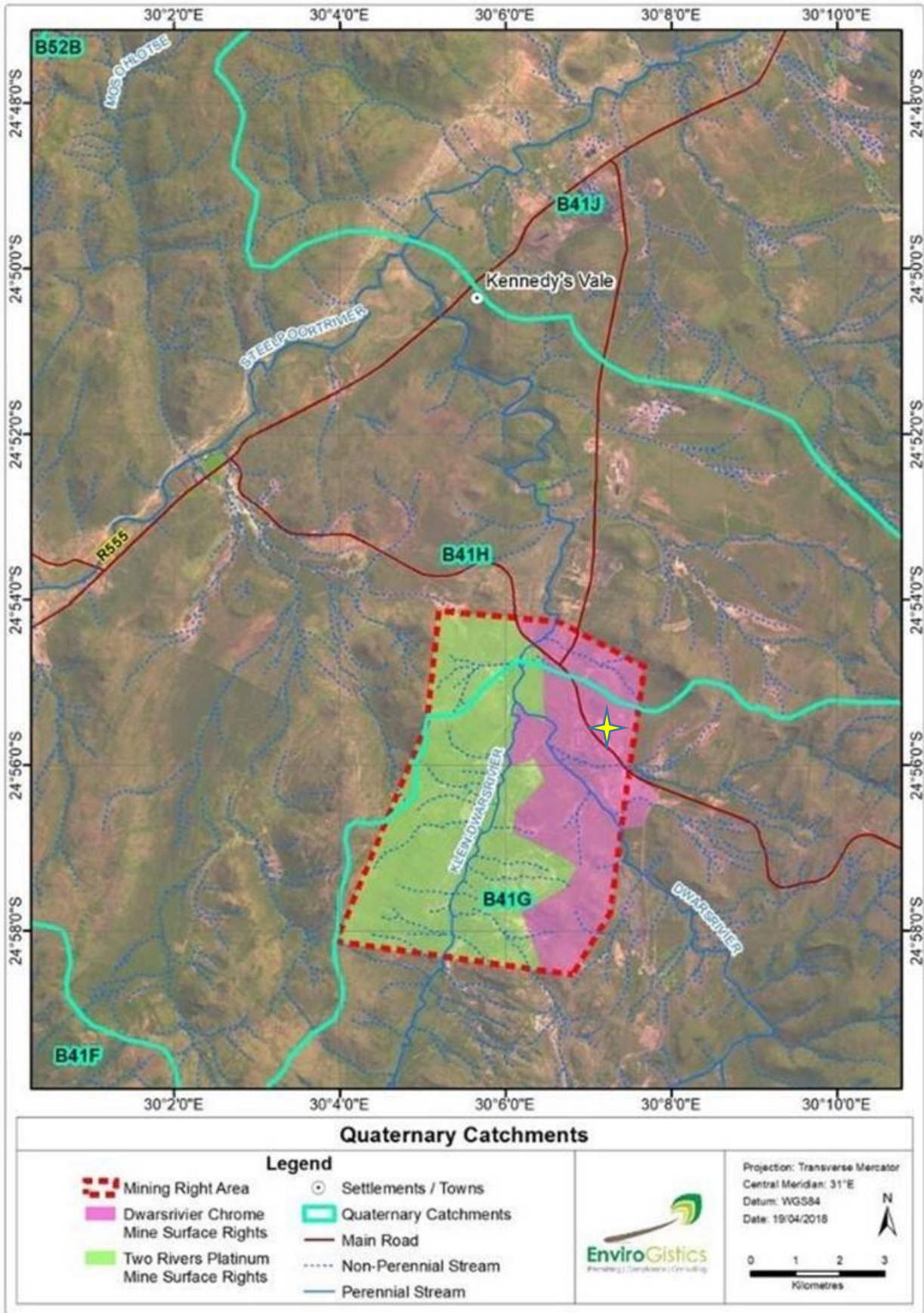


Figure 20: Quaternary Catchments

### 3.i.x.1.h Sensitive Sites or Wetlands

The majority of the mine falls within an area defined as a Freshwater Ecosystem Priority Area (FEPA) (which includes the current project), with the northern portion of the mine considered a Fish Support Area, and a small portion in the north also considered a Phase 2 FEPA. River FEPAs are important to achieve biodiversity targets for river ecosystems and threatened fish species and include rivers that are currently in a good condition (A or B ecological category). Although the FEPA status applies to the actual river reach, shading of the whole sub-quaternary catchment indicate that that the surrounding land and smaller stream network need to be managed in a way that maintains the good condition of the river reach.

Table 17: Characterisation of the watercourses associated with the Mining Right Area according to the Classification System (Ollis et. al., 2013)

Watercourse	Level 3: Landscape unit	Level 4: HGM Type
<ul style="list-style-type: none"> <li>☞ Groot Dwars River</li> <li>☞ Springkaanspruit</li> <li>☞ Klein Dwars River</li> <li>☞ Dwars River</li> <li>☞ Northern and Southern Unnamed tributaries</li> <li>☞ Western and Eastern Ephemeral Drainage Lines</li> </ul>	<p><b>Valley floor:</b> The base of a valley, situated between two distinct valley side-slopes.</p>	<p><b>River:</b> a linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water.</p>
<ul style="list-style-type: none"> <li>☞ Klein Dwars River; and</li> <li>☞ Lower reaches of:</li> <li>☞ Groot Dwars River</li> <li>☞ Springkaanspruit</li> </ul>	<p><b>Valley floor:</b> The base of a valley, situated between two distinct valley side-slopes.</p>	<p><b>Floodplain wetland:</b> the mostly flat or gently sloping land adjacent to and formed by an alluvial river channel, under its present climate and sediment load, which is subject to periodic inundation by over-topping of the channel bank.</p>

No construction activities will be undertaken within 32m of the watercourse. The project area will be within 100m of the Springkaanspruit, but will remain outside of the 1:100 year floodline (please refer to the following four figures).

The proposed project will not be located within proximity of a wetland system or within the 500m riparian zone buffer of the Groot Dwars River.



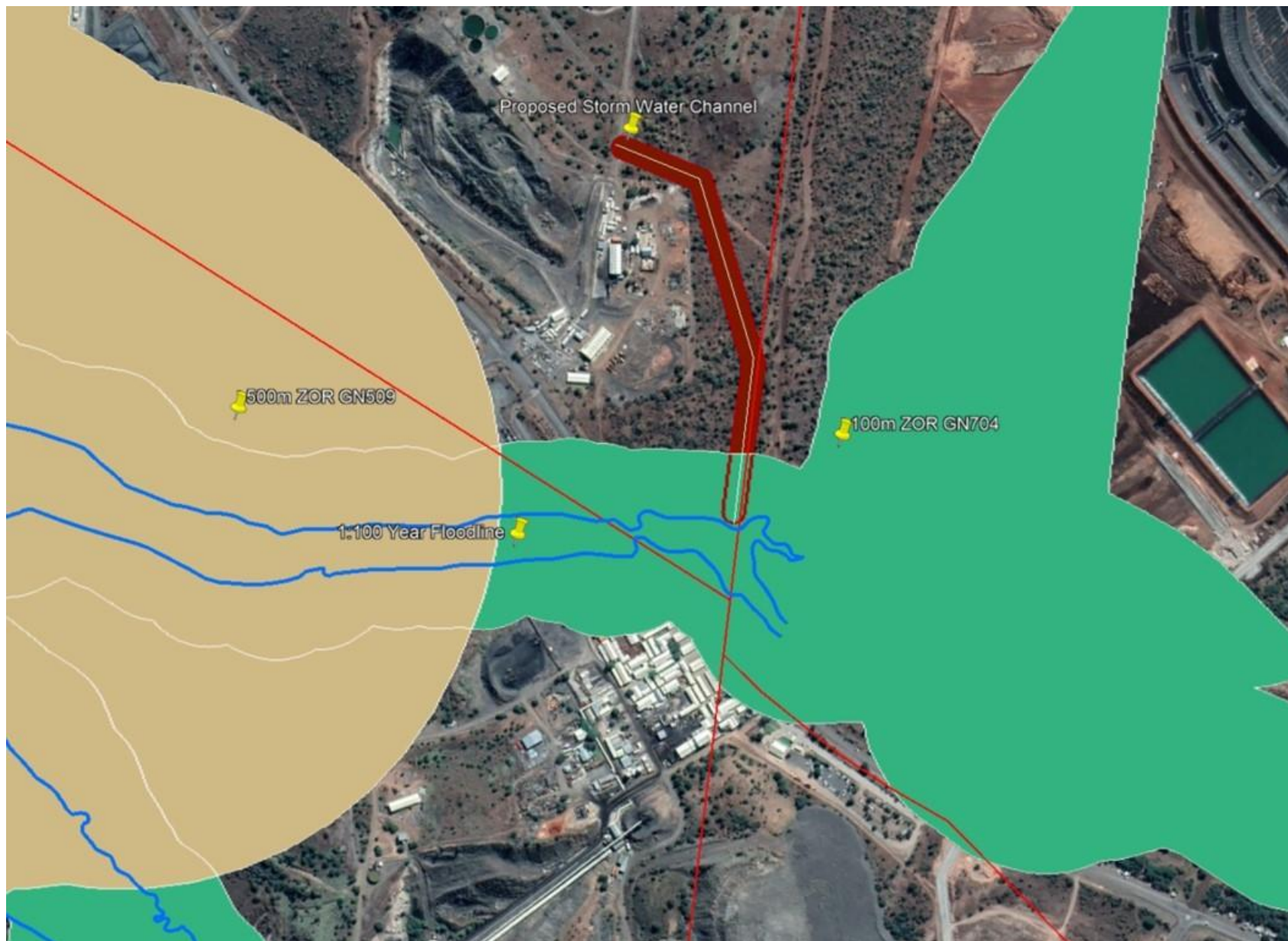


Figure 21: 500m and 100m Zone of Regulation (ZOR) Buffers



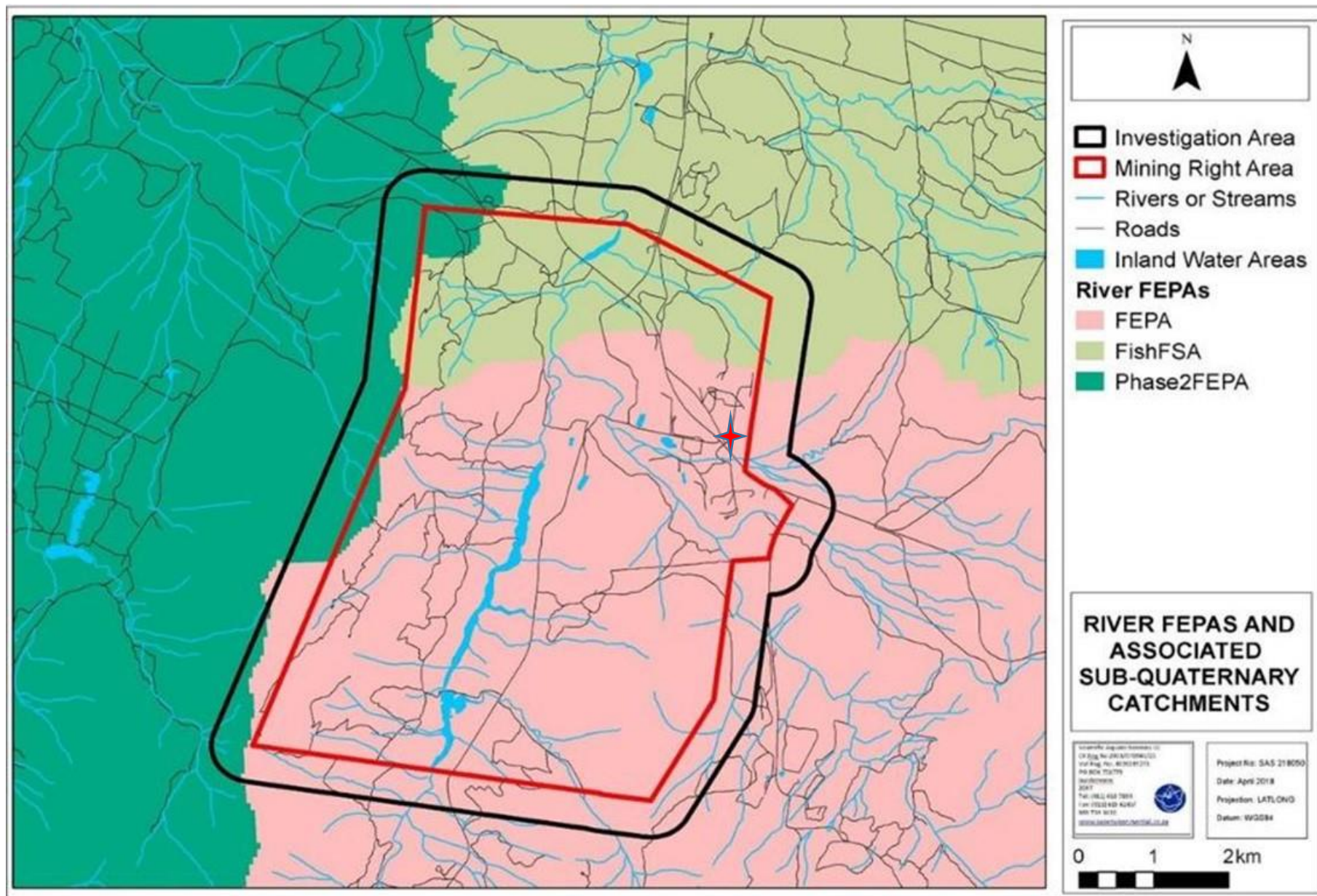


Figure 22: River FEPAS and associated sub-quaternary catchments associated with the Mining Right Area, according to NFEPA (2011)



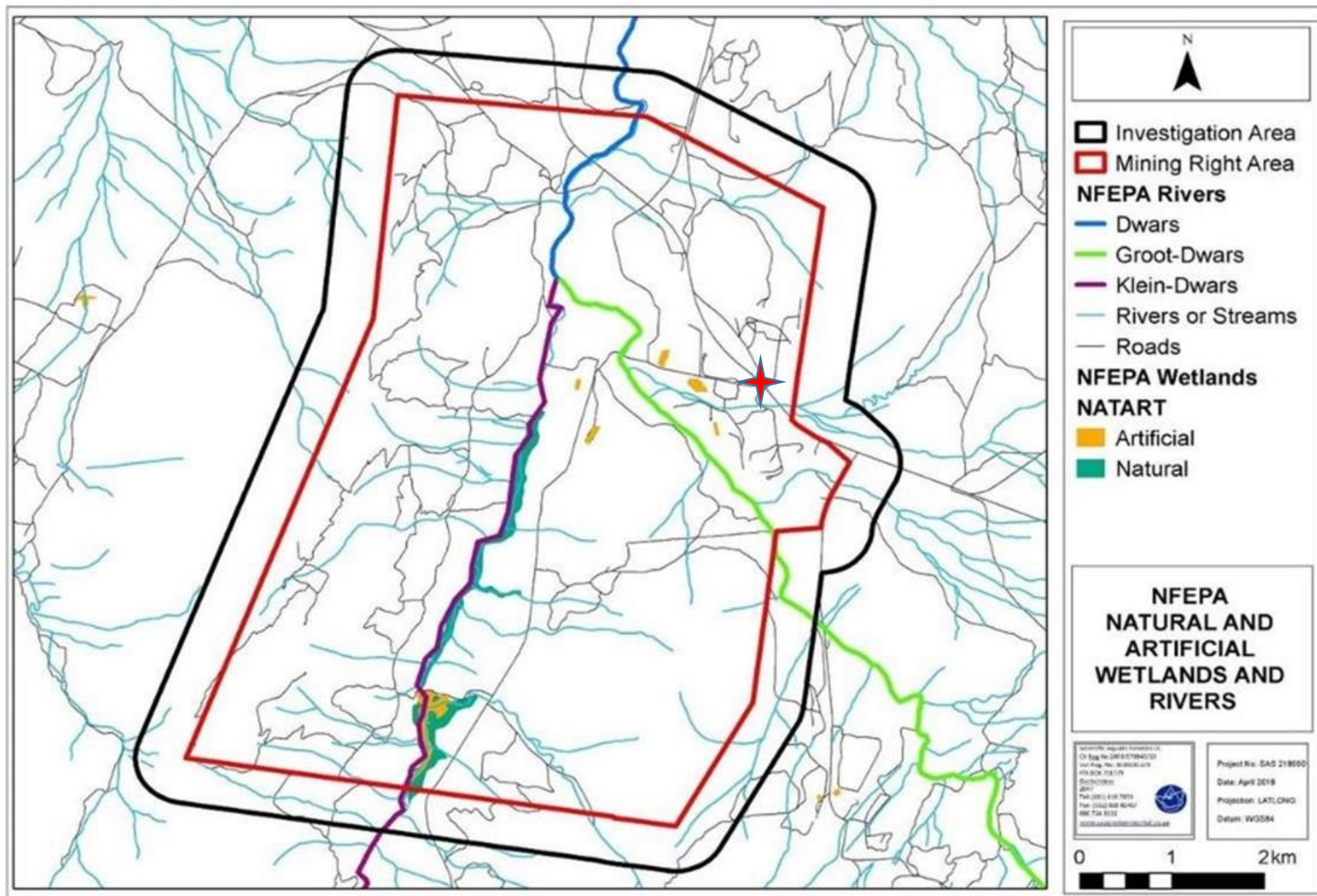


Figure 23: The natural and artificial wetland features and rivers associated with the Mining Right Area, according to the NFEPA database (2011) (SAS, 2018)



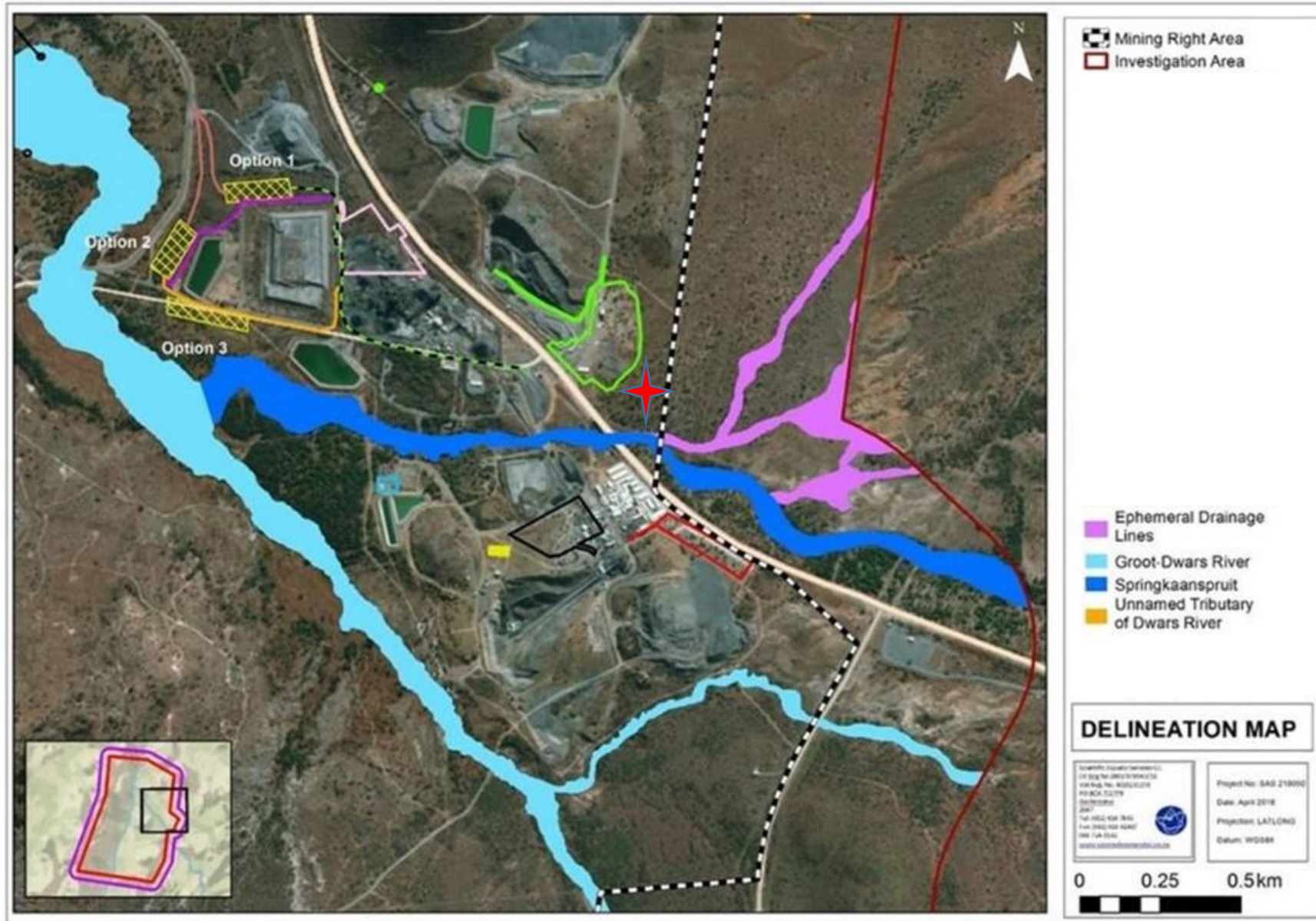


Figure 24: The location of the various drainage systems identified within the Mining Right Area (star indicating proposed project) (SAS, 2018)

## Springkaanspruit

### **PES Category: Instream Index of Habitat Integrity (IHI) PES Category B, Riparian IHI PES Category C**

The Groot Dwars River has been subjected to a variety of impacts over several decades, most notably impoundment (i.e. the Der Brochen Dam – also known as the Richmond Dam, located approximately 12km upstream of where the Groot Dwars River enters the Mining Right Area). In addition, channel straightening, weirs, and bridge crossings are present at various points along the river, including within the Dwarsrivier Mine Mining Right Area. These modifications will have an impact on the flow regime, although the Der Brochen Dam and other smaller impoundments will also play a significant role in sediment trapping. Mining activities, including the movement of heavy mining vehicles along gravel roads in the catchment, particularly those which traverse the river, contribute to increased sedimentation of the system. The riparian vegetation community composition remains largely natural, although localised alterations to species composition were also noted within the more disturbed areas (for example, around road crossings). Increased sedimentation and increased nutrient loads are apparent in the floodplain area where the Groot Dwars River confluences with the Klein Dwars River, as indicated by the monotypic stands of *Phragmites australis*. The lower reaches of the Springkaanspruit, which enters the Mining Right Area in the north-east, confluencing with the Groot Dwars River in the vicinity of the mine's Return Water Dams have been impacted by road and conveyor crossings, increased sedimentation due to mining activities and altered vegetation communities. However, the upper reaches located outside of the Mining Right Area are unlikely to have been significantly impacted since few disturbances occur in that vicinity.

In Government Gazette Number 39943 issued 22 April 2016, it is indicated that the Klein Dwarsrivier at the confluence with the Groot Dwars River (quaternary catchment B41G), should be maintained at Ecological Category D. For the overall Steelpoort River (quaternary catchment B41K), it is also stated that an Ecological Category D should be maintained. It is thus clear that catchment wide impacts have occurred, and that the system is recognised as being a “working river” (SAS, 2018).

The Groot Dwars River and the Springkaanspruit are considered to provide **intermediate** levels of ecological service provision, although due to the reduced ecological integrity, ecoservice provisioning by the Springkaanspruit is likely to be lower than that of the Groot Dwars River. Both systems are considered important in terms of benefits such as flood attenuation, streamflow regulation, and assimilation of nutrients and toxicants. Whilst the Dwarsrivier Mine Mining Right Area, and other mining properties adjacent to the mine, are largely restricted access areas, when assessing socio-cultural benefits provided by these systems, consideration was given to portions of the rivers which are accessible to local communities. Thus, benefits such as harvestable resources (e.g. fish) and tourism are considered possible, if not directly within the Dwarsrivier Mine property.

### **EIS Category: Springkaanspruit - High**

The Springkaanspruit, having undergone a slightly greater degree of modification, is nevertheless considered important in terms of service provision to downstream systems, as well as from a biodiversity maintenance perspective, however, due to its reduced ecological integrity, is not deemed to be as ecologically important as the Groot Dwars River.

### **Recommended Ecological Category (REC): Category B/C**

The Springkaanspruit, should be managed and maintained appropriately, i.e. no further impacts should be permitted, and efforts should be made to rehabilitate those areas which have been affected by current mining operations. The Springkaanspruit should be managed as a REC C.

Please refer to Figure 25 and Figure 26.



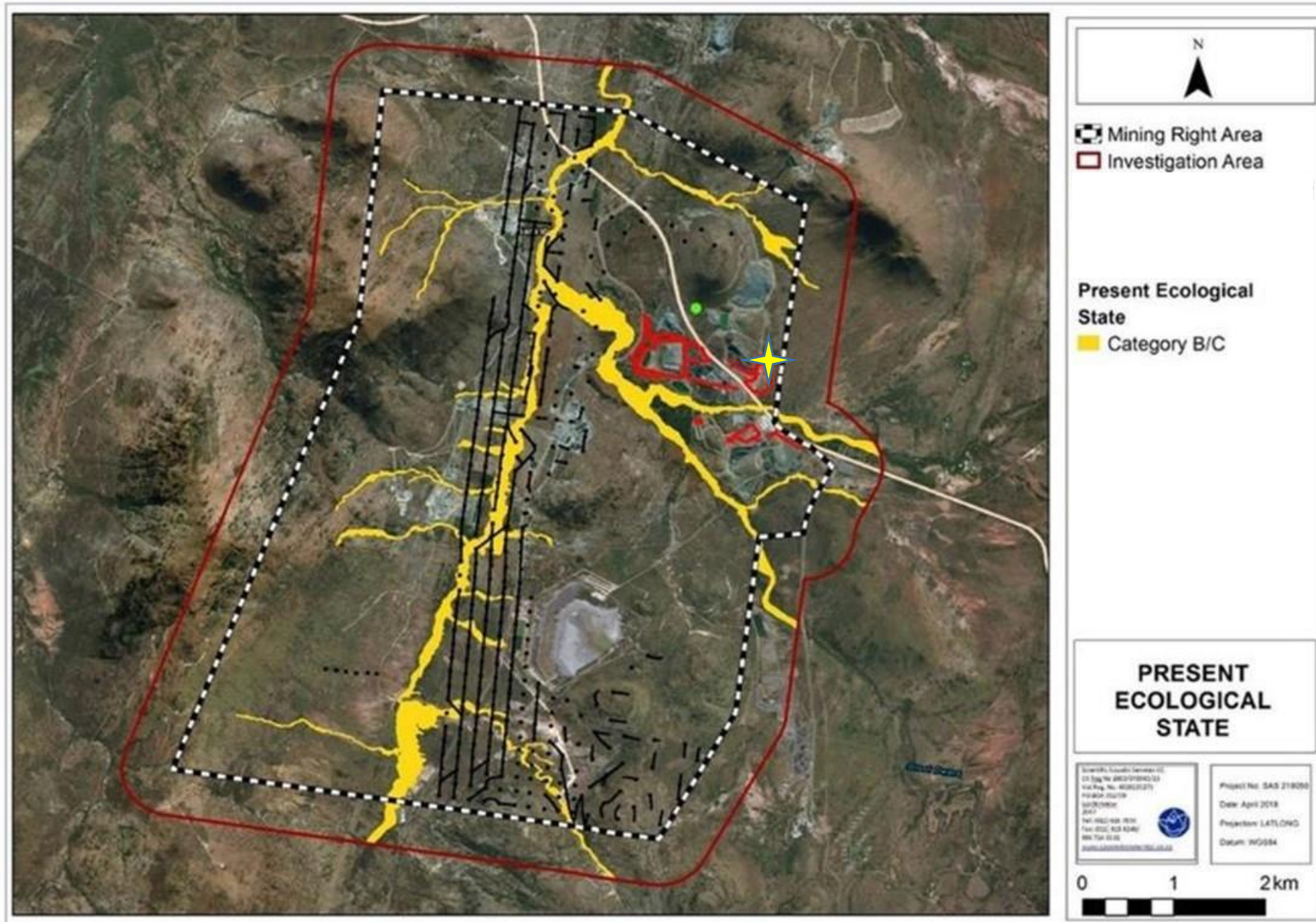


Figure 25: Conceptual presentation of the Present Ecological State (PES) categories applicable to the assessed freshwater resources (star indicating project area) (SAS, 2018)



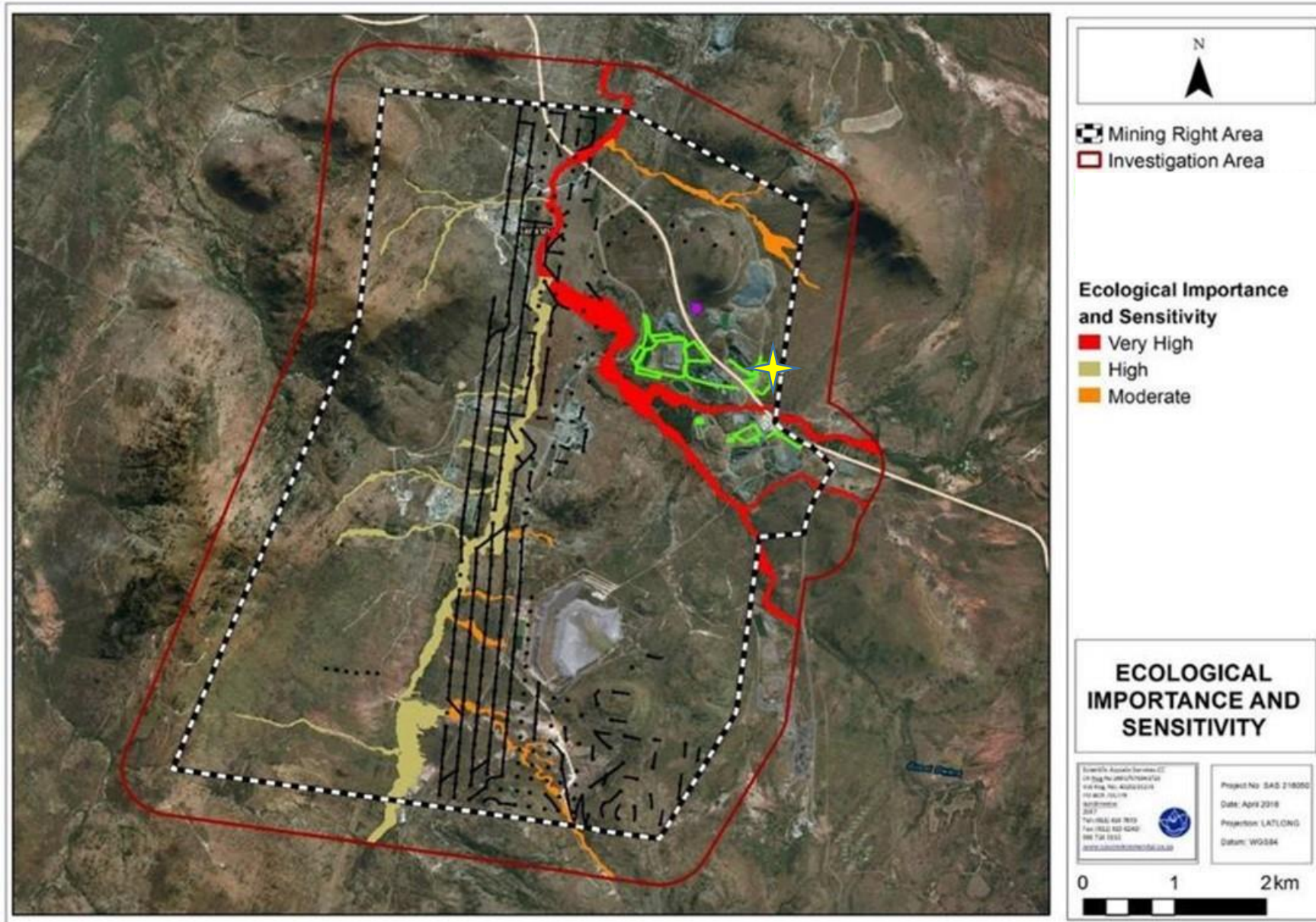


Figure 26: Conceptual presentation of the Ecological Importance and Sensitivity (EIS) of the assessed freshwater resources (star indicating project area) (SAS, 2018)

### 3.i.x.1.i Air Quality

Sources of potential air emissions and/or pollution significance for the overall mine includes:

- ☞ Transfer of ore from underground to Run of Mine (ROM) stockpiles by belt conveyor (wind entrained particulate matter);
- ☞ Vehicle exhaust gasses – both on and off site;
- ☞ Dust generated from vehicles driving on unpaved roads within mine boundary;
- ☞ The reclamation of the tailings dam and the rock dump will produce dust;
- ☞ Dumping of the processed material from the tailings into the north and south old pit will also produce dust; and
- ☞ Other surrounding mining operations and tailings facilities.

It is unlikely that the proposed storm water channel would have any additional impacts or contribution to air quality directly. The mine has, monitoring points for dust fallout which are monitored monthly.

### 3.i.x.1.j Noise

A noise impact assessment was conducted by dBAcoustics in May 2009 and this revealed the following sources of noise along the boundaries of the mine:

- ☞ Traffic noise – both light motor vehicles and heavy-duty trucks;
- ☞ distant mine noise;
- ☞ mine activity noise;
- ☞ industrial noise; and
- ☞ ventilation noise.

No additional noise assessment was undertaken as the activities in question is located within the existing mining footprint and will be a pure expansion of existing facilities.

Of particular significance is the presence of the R577 regional road from Sekhukhune land to Lydenburg that transects the mine property and is adjacent to the main mining activities on Dwarsrivier Mine, most importantly the processing plant, conveyor and workshops. Also important is the presence of four other mining operations in the vicinity of Dwarsrivier Mine.

These contribute noise directly to the ambient noise levels, but also indirectly through the presence of heavy duty and other traffic on the R577 and minor access roads to the mines. The area cannot be classified as rural according to Table 2 of SANS 10103 due to the above factors.

The following conclusions were drawn from the results of the noise impact assessment:

- ☞ The prevailing ambient noise levels along the boundary of the mining area are lower than the recommended noise level for an industrial area;
- ☞ The prevailing ambient noise levels are largely caused by emissions from a combination of noise sources;
- ☞ The significance of the noise impact from the activities at the proposed mine on the existing immediate environment will be medium according to the standardised risk matrix; and
- ☞ According to Table 5 of SANS 10103 of 2008, the community response to the industrial type noise will be medium due to the higher prevailing ambient noise levels already experienced in this area from other mining activities.

No changes to the ambient noise levels are foreseen to be contributed by the proposed project.

### 3.i.x.1.k Cultural and Heritage Setting

In anticipation of other mining activities in the greater study area, archaeologists have completed numerous heritage surveys including Huffman & Schoeman (2001, 2002a and b); van Schalkwyk (2005); Roodt (2003a, 2003b, 2003c, 2005, 2008a, 2008b); Van der Walt & Fourie (2006); Van der Walt & Celliers (2009); Van der Walt (2009; 2016, 2017) and Pistorius (2007, 2010, 2011) as well as Van Vollenhoven and Pelsler (2001, 2002) and Van Vollenhoven (2012 and 2013) for various EIAs and EMP's). These studies provide a good understanding of the archaeology of the area and use of the wider landscape. Since 2001, heritage surveys have recorded more than 240 sites in the greater study area, ranging from the Middle Stone Age to the recent households of farm labourers.



The distribution of the sites on the landscape shows different land use patterns. Many agriculturally-orientated societies (making Eiland, Leolo and Marateng pottery) built their villages in the valleys near cultivatable alluvium. Others (probably Ndebele) built terraced-settlements on basal slopes of the valley edge, while farm labourers usually lived in the valleys as well. During the 19th Century, farmers lived around the edge of high meadows as a measure of protection. A few Middle Iron Age Eiland sites were also cited in this plateau environment.

No known grave sites are indicated in the study area however grave sites can be expected anywhere on the landscape and several grave sites have been recorded (e.g. Van Vollenhoven & Pelser, 2001) in the project area. This was confirmed with a heritage study. Please see the tracks indicated in the figure below:

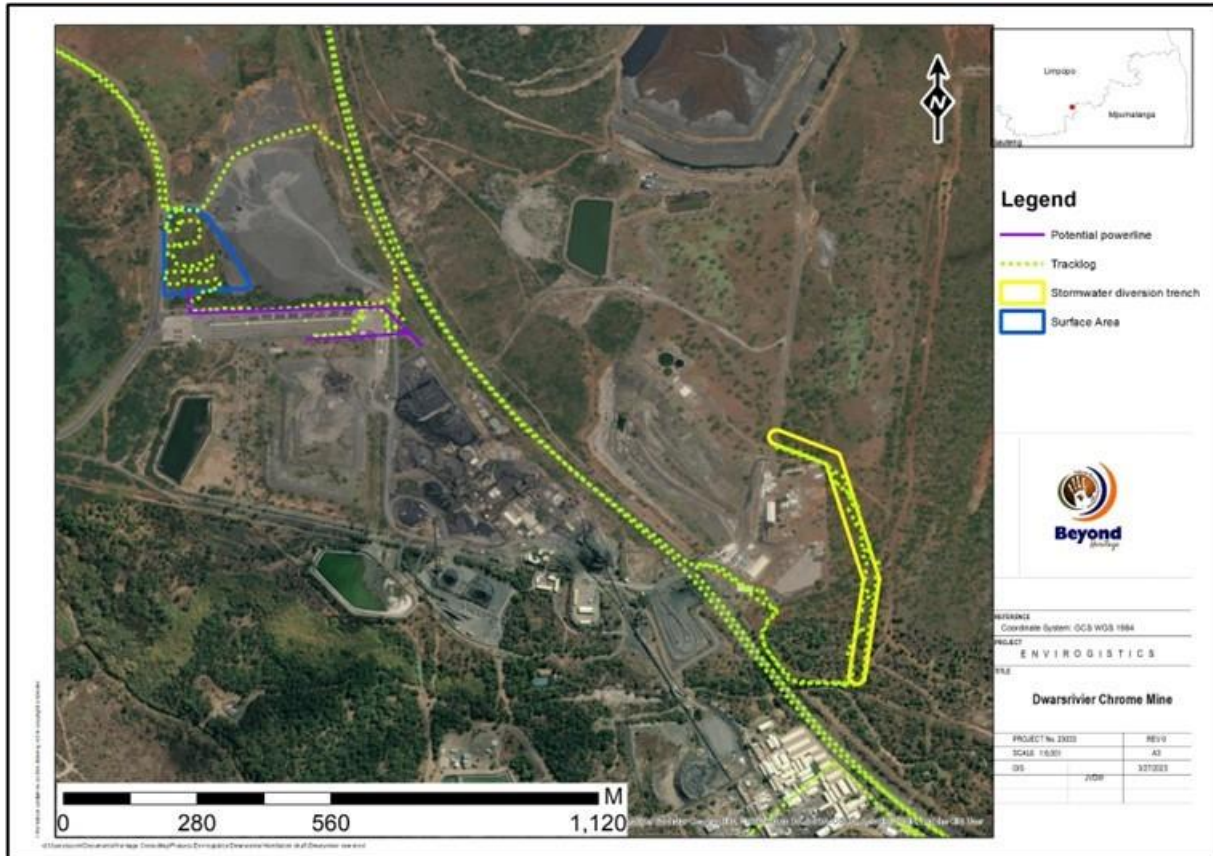


Figure 27: Tracklog of the survey path in green

Various heritage studies have been undertaken in the past for the purposes of Environmental Assessment Projects, as well as for the development of a Heritage Management Plan. The figure below indicates the location of the best-known sites. The closest known heritage site within the Mining Rights Area to the proposed storm water channel upgrade project is about 730m to the west. These are graves located within the Plant area.

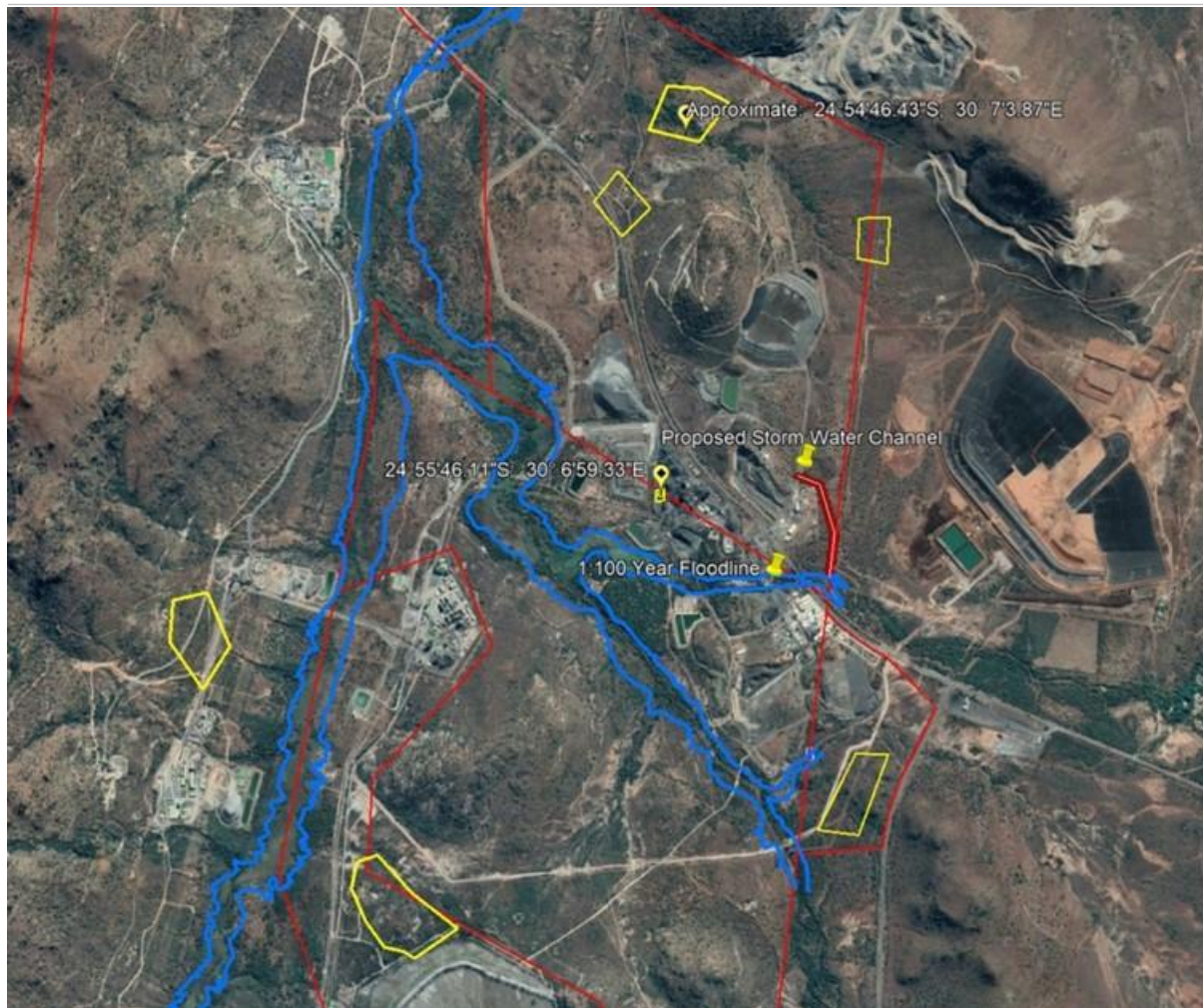


Figure 28: Known Heritage Sites (yellow blocks)

### 3.i.x.1.l Socio-Economic Setting

#### 3.i.x.1.m Sekhukhune District

The Sekhukhune District Municipality was established in December 2000. It consists of four Local Municipalities, namely Elias Motsoaledi, Ephraim Mogale, Fetakgomo/Tubatse, and Makhuduthamaga Local Municipalities. The district is situated in the Limpopo province, to the northwest of Mpumalanga and within the southern section of the Limpopo Province. The Sekhukhune District Municipality covers an area of approximately 13 264 m<sup>2</sup>. Most of the area is typical rural as only 5% of Sekhukhune population lives in urban areas.

The main urban centres are Groblersdal, Marble Hall, Burgersfort, Jane Furse, Ohrigstad, Steelpoort and Driekop. Outside these major towns, one finds almost 605 villages which are generally sparsely populated and dispersed throughout the district.

#### 3.i.x.1.n Study area

The area falls under the jurisdiction of the Sekhukhune District and the Fetakgomo Tubatse Local Municipality (Fetakgomo Tubatse Local Municipality).

According to the recent official demographic survey results (2016), the Fetakgomo Tubatse Local Municipality has a total population of 490 381 people (Statistics South Africa Community Survey, 2016).

There is overwhelming strong statistical evidence that the population is growing at an exponential rate. There are more females 251 923 (51%) than males 238 458 (49%) in the population pyramid. Of the total population within the Fetakgomo Tubatse Local Municipality, 223 214 are young people. The youth thus represent 46% of the total population figure.



The Dwarsrivier Mine falls within Ward 27 of the Fetakgomo Tubatse Local Municipality and has a population of 12 527 (Statistics from 2011). Ward 27 has the following villages: Moshate, Tsakane, Kalkontein, Mabelane, Makakatela, Kutullo A&B, Shushumela & Matepe, Kutullo C&D, Dithamaga and Madibeng.

The main economic sectors within Fetakgomo Tubatse Local Municipality include agriculture, mining and quarrying, trade, tourism, manufacturing, general government, community, social and personal services, catering and accommodation.

### 3.i.x.1.o Social Profile

#### 3.i.x.1.o.1 Population Figures

The following table provides an outline of the population figures in the affected ward and how it compares to those of the municipality, district and province.

Table 18: Population figure

Ward	Population	People per km <sup>2</sup>	Number of Households	% Under 20 Years Age Group
Ward 27	12 527	18.9 km <sup>2</sup>	2 727	48%
Fetakgomo Tubatse Local Municipality	489 902	85.9 km <sup>2</sup>	125 363	42%
Sekhukhune District Municipality	1 169 762	85.7 km <sup>2</sup>	290 526	45%
Limpopo Province	5 799 990	46.1 km <sup>2</sup>	1 601 083	44%

The population figures indicate a study area which is not densely populated compared to the rest of the Fetakgomo Tubatse Local Municipality. The percentage of youth under the age of 20 years comprises approximately half of the population sector within Ward 27. The Fetakgomo Tubatse Local Municipality has a lower percentage of people within the under 20 years age category, but this figure still remains high. Employment creation within the municipality and especially within the ward, over the long term, is thus critical.

Ward 27 constitutes 1% of the total Fetakgomo Tubatse Local Municipality population.

#### 3.i.x.1.o.2 Education Levels

Based on information received, the percentage within Ward 27 that achieved Grade 12 compares much lower to the levels of the Fetakgomo Tubatse Local Municipality. The levels of higher education achieved in the study area are also lower than those of the Fetakgomo Tubatse Local Municipality, the district and province.

Table 19: Education Levels

Municipality / Ward	No Schooling	Grade 12	Higher Education
Ward 27	16%	19%	1%
Fetakgomo Tubatse Local Municipality	16%	26%	4%
Sekhukhune District Municipality	16%	26%	4%
Limpopo Province	14%	28%	6%

#### 3.i.x.1.o.3 Employment and Income Levels

The table below shows relatively higher average income levels in the Ward and Fetakgomo Tubatse Local Municipality compared to the Sekhukhune District Municipality. This could be due to the various mining activities in the area responsible for various employment opportunities.

Table 20: Employment and Income Levels

WARD	Employed	Other not economically active	Average Annual household income
Ward 27	22.1%	43%	R29 400

<b>Fetakgomo Tubatse Local Municipality</b>	23%	47%	R57 500
<b>Sekhukhune District Municipality</b>	20.9%	50%	R14 600
<b>Limpopo Province</b>	27.4%	49%	R30 000

#### 3.i.x.1.o.4 Skill levels of the labour force

According to the Fetakgomo Tubatse Local Municipality Integrated Development Plan (IDP), there is a shortage of relevant skills among locals which results in a situation where skills for the mining industry are sourced from outside the province. This hampers the municipality's job creation efforts. Skills shortages are thus a challenge that needs to be overcome.

#### 3.i.x.1.o.5 Infrastructure

The majority of residents within the Fetakgomo Tubatse Local Municipality live in formal dwellings (76%), which is approximately the same as within the Sekhukhune District. The area where the proposed development is situated (Ward 27), however has only 67% living within formal dwellings and 22.5% of the residents that live within informal dwellings. The latter is almost double the figure of those within the Fetakgomo Tubatse Local Municipality and the Sekhukhune District.

Fetakgomo Tubatse Local Municipality can be seen as a water stressed municipality. According to the community survey of 2016, 58 255 households have access to piped water and 67 208 households have no access to piped water. Of the 39 wards in the Fetakgomo Tubatse Local Municipality, almost all the villages source water from boreholes, rivers, dams and tanks. The main reasons for this situation is illegal water connections, limited communal and aging infrastructure, drought, lack of financial resources, the topography of the area, as well as the number of informal and scattered settlements through the municipal area.

Within Ward 27, 62% of the households obtain their water from the river, but 19.5% of the households do receive their water from a regional or local water service provider. The majority of households (72.4%) also use pit latrines.

Villages within Ward 27 all have access to electricity services, although there are some households that still need to be connected. The area however experiences frequent power outages.

#### 3.i.x.1.p Economic activities

The Fetakgomo Tubatse Local Municipality has the following investment opportunities:

- ☞ mining investment;
- ☞ land availability;
- ☞ tourism;
- ☞ funding source from private sector; and
- ☞ job creation from infrastructure investment.

Mining still presents the largest opportunity in the area and the mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality.

The mining industry is furthermore the municipality's leading job creator and key economic growth driver. With all major mining houses fully represented in the municipality, locals pin their hopes for jobs and income security in this sector. The mining sector accounts for 34% of the Municipality's total Gross Value Added (GVA) and 54% of the total labour force in the formal sector. The job absorption patterns during a 12-year review period in the sector shows that year 2012 witnessed the highest number of jobs (1833) created.

The agriculture sector in the Fetakgomo Tubatse Local Municipality is still emerging and heavily under-invested. Lack of mechanisation makes smallholder farming one of the smallest contributors to the municipality's economic growth.

The manufacturing sector covers the manufacturing of goods, products and beverages. It also comprises the production, processing and preservation of meat, fish, fruit, vegetables, oils and dairy products; grain mill,

starches and tobacco products; textile products; spinning, weaving; and petroleum products and nuclear fuel. This sector has a vast potential as job creator but is still in its infancy.

With regards to the tourism sector, it was noted that the unique selling benefits of local heritage sites and other tourism facilities in the municipality are not effectively profiled and marketed. The tourism sector is further being overshadowed by mining to the extent that more strategic focus is unevenly invested in the latter at its expense.

The area surrounding the mining site is characterised by mining activities of other chrome and platinum mines. Some of the neighbouring farms in the area are further used for livestock grazing and the production of vegetables, lucerne and cotton.

### 3.i.x.2 Type of Environment Affected by the Proposed Activity

Please refer to the preceding section detailing the environmental setting in which the mine is located. The proposed activities are considered an improvement on the environmental setting to give effect to sound environmental and water management measures. The following however still is required to be taken into consideration as part of ongoing management measures:

- ☞ Clearance of Vegetation; and
- ☞ Limited removal and stockpiling of soils.

These activities may therefore impact on the following:

- ☞ Hydrological setting (runoff towards Springkaanspruit during construction activities);
- ☞ Ecological setting (removal of vegetation and potential spread of AIP species);
- ☞ Soils (removal of soils for stockpiling); and
- ☞ Topography (shaping).

### 3.i.x.3 Description of the Current Land Uses

#### 3.i.x.3.a General Land Uses

The current land use for the area is for mining operations, with the TRP and Glencore Thorncliffe Mines operating in the adjacent farm portions.

Dwarsrivier Mine has been mining chromite ore from the LG6 seam since 1999. Between 1999 and 2005, ore was mined using opencast methods. The six pits have subsequently been mined out and backfilled with the exception of the South and North Pit portals from which access is gained to the underground workings. The current mine plan extends the life of the operations to the year 2042 (24 years). Dwarsrivier Mine indicated that the mine plan has not changed since the 2015 numerical modelling was undertaken (iLEH, 2015).

The abstraction of groundwater for potable use was included in the assessment presented in this report. Six boreholes are applied for in terms of the WUL (Borehole C is not in use currently) are used for groundwater abstraction, namely BHA, B, C, D1, D2 and E.

All opencast mining has ceased and the pits have been backfilled and partially rehabilitated. These areas were delineated as part of the annual rehabilitation plan, completed by GCS in 2016. Access to the underground workings is gained from both North and South Pits. The two decline shafts are constructed in the high walls of the pits.

Tailings material was backfilled into both North and South Pits. The majority of the tailings material was backfilled into North Pit while the construction of the North TSF was completed. A Return Water Dam (RWD) was constructed in the north-western part of North Pit during this period. The RWD was excavated into backfilled tailings and lined with HDPE.

The old TSF situated west of the Plant is partially reprocessed. Tailings are currently deposited in the North TSF, which was commissioned in 2012. The remaining life of the North TSF is estimated to be around 12 years.

Several dams are used on site to contain and transfer dirty water around the operations. These include two pollution control dams, the Upper RWD and the Lower RWD, situated adjacent to the old TSF. Both dams are lined with HDPE. Extraneous water is pumped from the underground workings to the Clarifier. From here, water is transferred to Dam 26. Approximately half of the extraneous water is pumped back underground for reuse.

Several waste rock dumps (WRDs) are situated around the operations. Some of these dumps have been rehabilitated. The operational WRDs are situated to the north of the old TSF (the northern Discard Dump).

Pre-Mining Land Use

Prior to the sale of the land for mining purposes, a portion of the property was used for agriculture under irrigation, the dominant crops being maize, lucerne, cotton and vegetables. The remainder of the property was used for grazing and wilderness land. The valley lines and wetland areas were left uncultivated.

Historical Potential

The estimated dryland production potential of the area is 4 tons per hectare (t/ha). The grazing capacity is approximately seven large stock units per hectare. The irrigated land potential is in the order of 6 - 10 t/ha for maize.

Evidence of Misuse

The only evidence of misuse is erosion gullies in some areas and the presence of borrow pits where the soils and underlying soft rock materials have been removed.

Current Land Use

All of the footprint areas earmarked for the various projects are not under current cultivation, and have never been utilised for agricultural purposes except for the TSF area which has previously been cultivated (for subsistence purposes) but has since been laid to fallow. Scrutiny of the satellite imagery was made, and it was evident that the dominant land uses in the surrounding areas are mining and wilderness, with very few residential areas northeast of the Mining Right Area. No cultivated agriculture was observed within the immediate vicinity of the Mining Right Area.

The photos below present images of some of the land uses within the mining area.

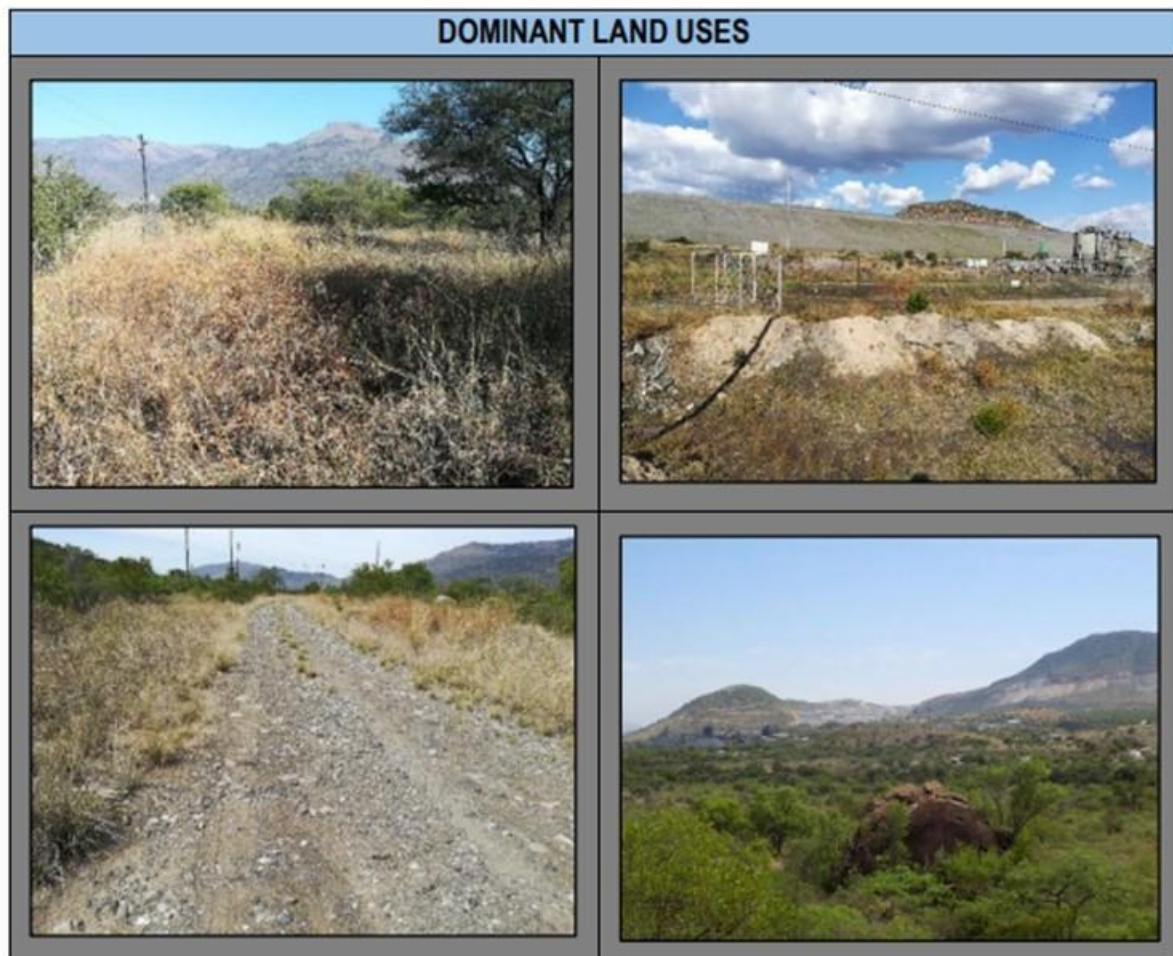


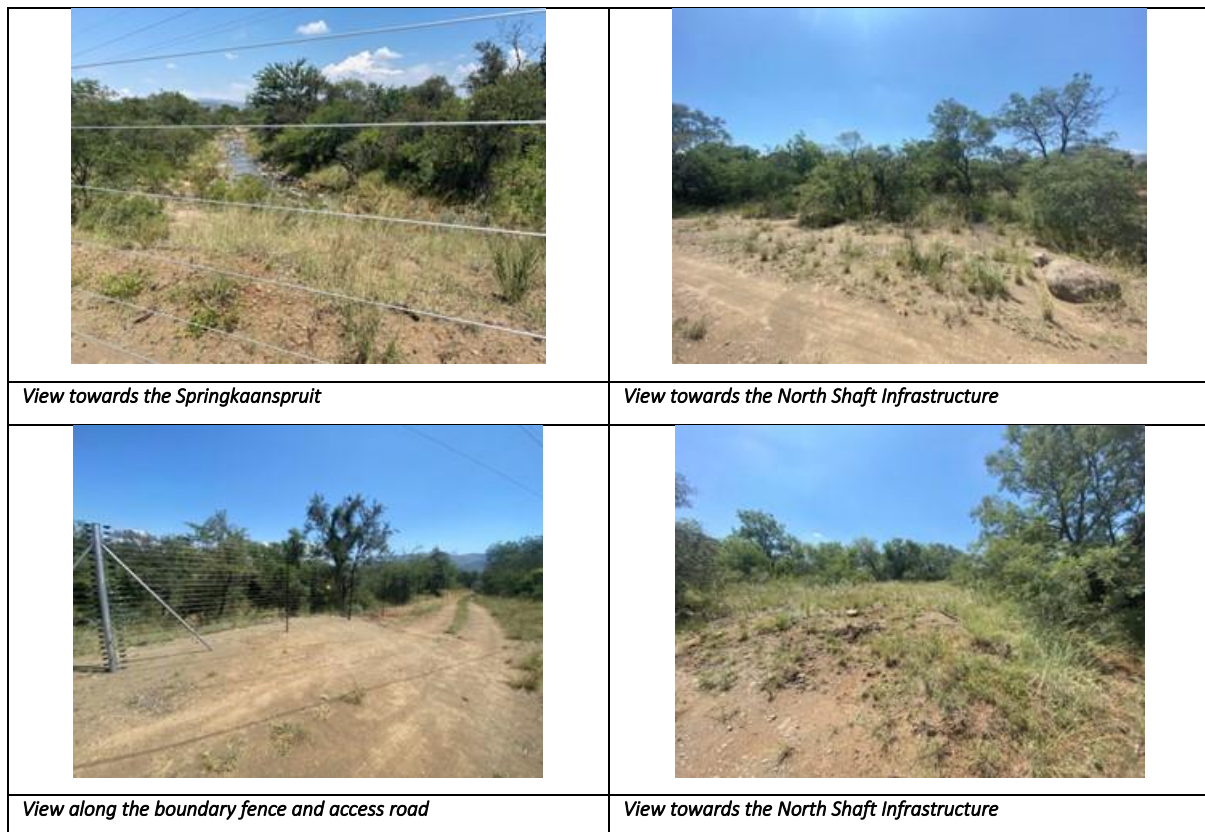
Photo 1: Images depicting current land uses within the Mining Right Area



**3.i.x.3.b Current Land Use**

The proposed project relating to the current Environmental Authorisation process involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining infrastructure at North Shaft. The purpose of the stormwater trench at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine’s operational areas. This is a condition in terms of the approved WUL Ref 24053346, dated 21 January 2008, which states that: *Storm water at the plant area shall be managed in accordance with Government Notice 704 and storm water leaving the premises shall in no ways be contaminated by any substance.*

The channel will be constructed around the North Shaft Infrastructure and the boundary fence between Dwarsrivier Mine and De Grooteboom Mine and the security road along the boundary fence. The area where the channel will be upgraded is characterised by a fairly undisturbed natural environment. Please see the following figures:



*Photo 2: Current Land Use Photographic Records – March 2023*

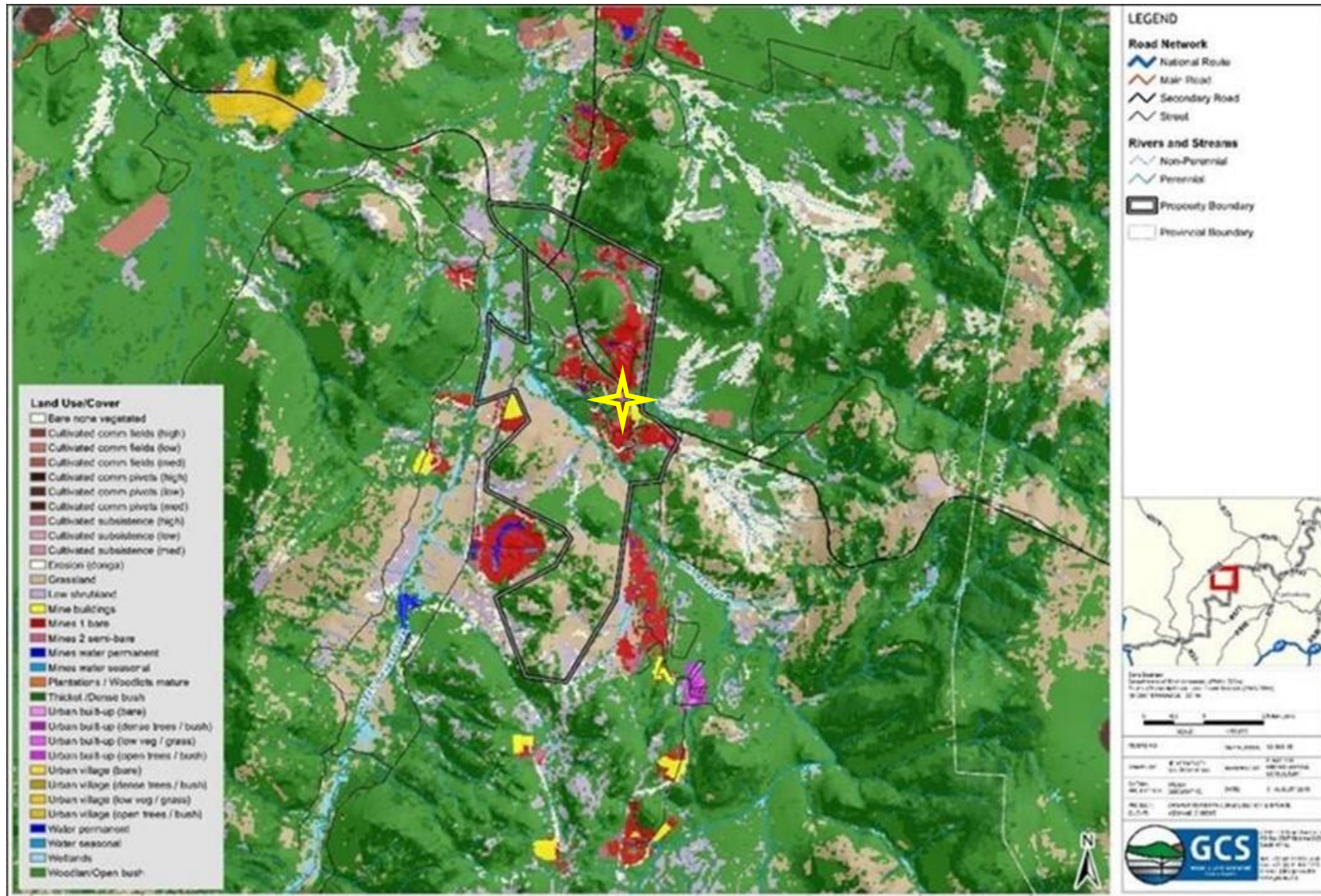


Figure 29: Land use map

### 3.i.x.4 Description of Specific Environmental Features and Infrastructure on Site

The following specific environmental features are present on site specifically of reference to the proposed project:

- ☞ The site is located in a CBA1 site (refer to Section 3.i.x.1.e).
- ☞ The proposed project will be located outside of the 1:100 year flood line (more than 1km from this river) of the Groot Dwarsrivier, as well as the 1:100 year floodline of the Springkaanspruit, its tributary (refer to Section 3.i.x.1.g).
- ☞ GN704 Exemption Requirements. The following section provides a discussion on the GN704 Exemption requirements for the project, due to the activities located within 100m from the Springkaanspruit.

According to regulation 4 of GN704, no person in control of a mine or activity may –

- (a) Locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year floodline or within a horizontal distance of 100 metres from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on water-logged ground, or on ground likely to become water-logged, undermined, unstable or cracked; and
- (b) Carry on any underground or opencast mining or prospecting or any other operation or activity under or within the 1:50 year floodline or within a horizontal distance of 100 m from any watercourse or estuary, whichever is the greatest.

The GN704 regulated zones are shown on the following figure. The following table indicates whether the proposed infrastructure falls within the regulated zones and whether a GN704 exemption should be applied for in terms of regulation 3.

Table 21: Proposed infrastructure location with regards to GN704 regulated zones

Proposed Infrastructure	Located in Regulated GN704 Zone		GN704 Exemption Required
	1:100 Year Floodline	100 m Watercourse Buffer	
Stormwater channel upgrade	No	Yes	Yes



Dwarsrivier Chrome Mine: Basic Assessment Report and Environmental Management Programme for the Proposed upgrade to the North Mine Storm Water Channel  
Mining Right Ref: 30/5/1/3/2/1(179) EM  
Project Ref: 202227  
Version: Draft

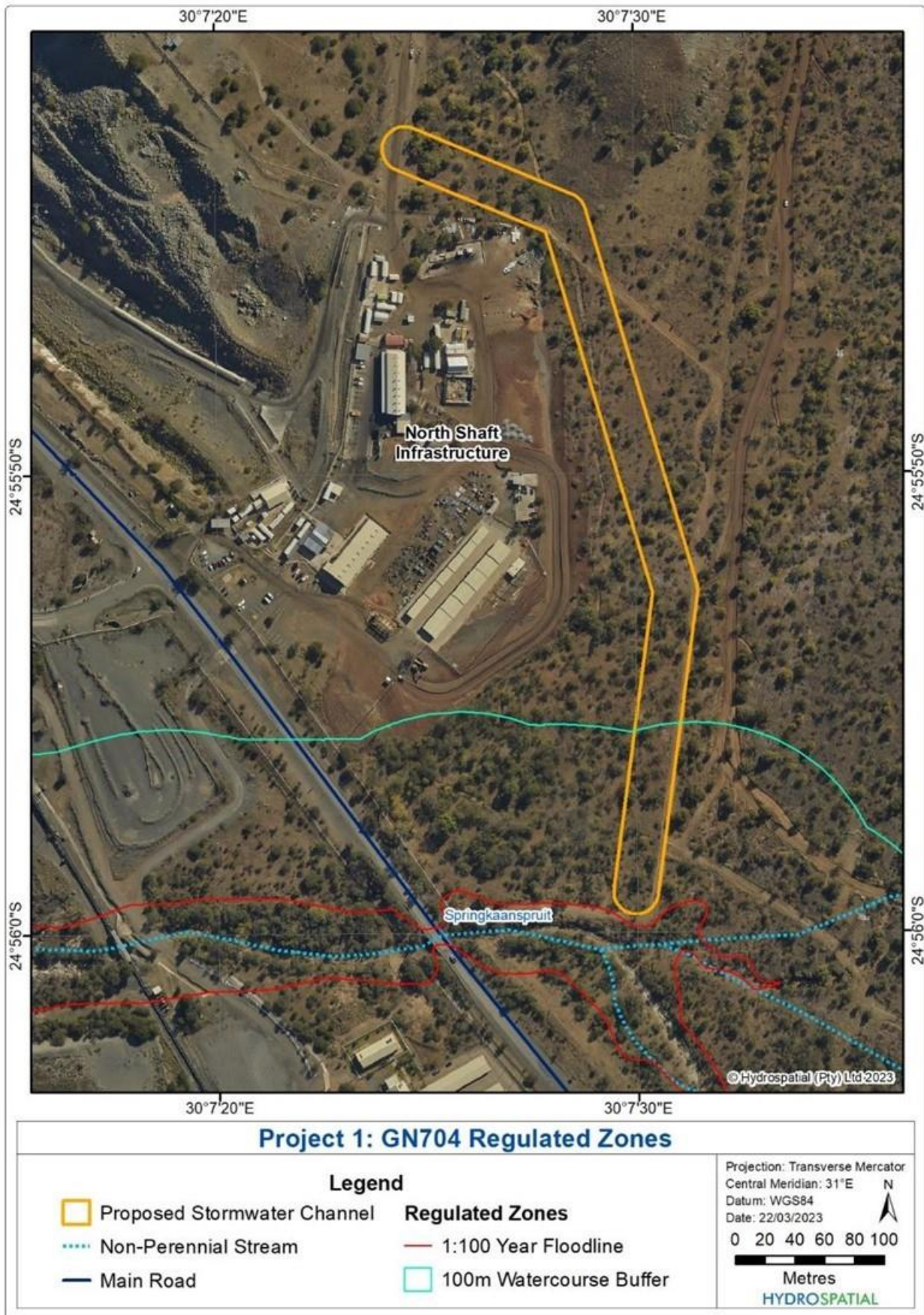


Figure 30: GN704 regulated zones for Project 1



### 3.i.x.5 Environmental and Current Land Use Map

Please refer to Figure 29.

### 3.i.xi Methodology used in determining and ranking the Nature, Significance, Consequences, Extent, Duration and Probability of potential Environmental Impacts and Risks

The following section presents the criteria used to assess the potential impacts.

#### 3.i.xi.1 Criteria of assigning significance to potential impacts

The evaluation of impacts is conducted in terms of the criteria detailed in Table 22 to Table 27. The various environmental impacts and benefits of this project are discussed in terms of impact status, extent, duration, probability, and intensity. Impact significance is regarded as the sum of the impact extent, duration, probability and intensity and a numerical rating system has been applied to evaluate impact significance. Therefore, an impact magnitude and significance rating is applied to rate each identified impact in terms of its overall magnitude and significance (Table 27).

In order to adequately assess and evaluate the impacts and benefits associated with the project, it was necessary to develop a methodology that would scientifically achieve this and to reduce the subjectivity involved in making such evaluations. To enable informed decision-making, it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impact or benefit on the surrounding natural and social environment.

##### 3.i.xi.1.a Impact Status

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of what causes the effect, what will be affected and how it will be affected. The nature of the impact can be described as negative, positive or neutral.

Table 22: Status of Impact

Rating	Description	Quantitative rating
Positive	A benefit to the receiving environment.	P
Neutral	No cost or benefit to the receiving environment.	-
Negative	A cost to the receiving environment.	N

##### 3.i.xi.1.b Impact Extent

The extent of an impact is considered as to whether impacts are either limited in extent or if it affects a wide area or group of people. Impact extent can be site specific (within the boundaries of the development area), local, regional or national and/or international.

Table 23: Extent of Impact

Rating	Description	Quantitative rating
Low	Site Specific; Occurs within the site boundary.	1
Medium	Local; Extends beyond the site boundary; Affects the immediate surrounding environment (i.e. up to 5 km from the Project Site boundary).	2
High	Regional; Extends far beyond the site boundary; Widespread effect (i.e. 5 km and more from the Project Site boundary).	3
Very High	National and/or international; Extends far beyond the site boundary; Widespread effect.	4

##### 3.i.xi.1.c Impact Duration

The duration of the impact refers to the time scale of the impact or benefit.

Table 24: Duration of Impact

Rating	Description	Quantitative rating
Low	Short term; Quickly reversible; Less than the project lifespan; 0 – 5 years.	1



Medium	Medium term; Reversible over time; Approximate lifespan of the project; 5 – 17 years.	2
High	Long term; Permanent; Extends beyond the decommissioning phase; >17 years.	3

### 3.i.xi.1.d Impact Probability

The probability of the impact describes the likelihood of the impact actually occurring.

Table 25: Probability of Impact

Rating	Description	Quantitative rating
Improbable	Possibility of the impact materialising is negligible; Chance of occurrence <10%.	1
Probable	Possibility that the impact will materialise is likely; Chance of occurrence 10 – 49.9%.	2
Highly Probable	It is expected that the impact will occur; Chance of occurrence 50 – 90%.	3
Definite	Impact will occur regardless of any prevention measures; Chance of occurrence >90%.	4
Definite and Cumulative	Impact will occur regardless of any prevention measures; Chance of occurrence >90% and is likely to result in in cumulative impacts	5

### 3.i.xi.1.e Impact Intensity

The intensity of the impact is determined to quantify the magnitude of the impacts and benefits associated with the proposed project.

Table 26: Intensity of Impact

Rating	Description	Quantitative rating
Maximum Benefit	Where natural, cultural and / or social functions or processes are positively affected resulting in the maximum possible and permanent benefit.	+ 5
Significant Benefit	Where natural, cultural and / or social functions or processes are altered to the extent that it will result in temporary but significant benefit.	+ 4
Beneficial	Where the affected environment is altered but natural, cultural and / or social functions or processes continue, albeit in a modified, beneficial way.	+ 3
Minor Benefit	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are only marginally benefited.	+ 2
Negligible Benefit	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are negligibly benefited.	+ 1
Neutral	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are not affected.	0
Negligible	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are negligibly affected	- 1
Minor	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are only marginally affected.	- 2
Average	Where the affected environment is altered but natural, cultural and / or social functions or processes continue, albeit in a modified way.	- 3
Severe	Where natural, cultural and / or social functions or processes are altered to the extent that it will temporarily cease.	- 4
Very Severe	Where natural, cultural and / or social functions or processes are altered to the extent that it will permanently cease.	- 5

### 3.i.xi.1.f Impact Significance

The impact magnitude and significance rating are utilised to rate each identified impact in terms of its overall magnitude and significance.

Table 27: Impact Magnitude and Significance Rating

Impact	Rating	Description	Quantitative rating
Positive	High	Of the highest positive order possible within the bounds of impacts that could occur.	+ 12 – 16
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. Other means of achieving this benefit are approximately equal in time, cost and effort.	+ 6 – 11
	Low	Impacts is of a low order and therefore likely to have a limited effect. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.	+ 1 – 5
No Impact	No Impact	Zero impact.	0
Negative	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or	- 1 – 5





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Impact	Rating	Description	Quantitative rating
		little will be required, or both. Social, cultural, and economic activities of communities can continue unchanged.	
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly possible. Social cultural and economic activities of communities are changed but can be continued (albeit in a different form). Modification of the project design or alternative action may be required.	- 6 - 11
	High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or a combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt.	- 12 - 16

*3.i.xii Impacts and Risks identified including the Nature, Significance, Consequence, Extent, Duration and Probability of the Impacts, including to which these Impacts*

The following tables present the list of impacts during various project phases, and indicate the nature, extent, duration, probability and significance, as well as whether these impacts can be avoided, are reversible or will result in residual impacts.

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Table 28: Planning Impact Assessment and Management Measures (Significance before Mitigation –SbM; Significance after Mitigation – SaM; Can be avoided – CbA; R – Reversible; Ir - Irreversible)

Name of Activity		Potential Impacts	Rating Prior to Measures					Mitigation Type	Rating Post Measures					Significance		
Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/Ir
Legal Requirements (Environmental Authorisations)	Legal Compliance	Unlawful water and waste management activities, which could lead to NWA Directives; NEMWA Norms and Standards contravention and NEMA Section 24G Rectification fines.	N	-4	-3	-2	-5	-14	A legal assessment of all activities and future planned activities must be undertaken annually to ensure that all activities are authorised.	P	4	3	5	5	17	CbA
									All legally appointed personnel responsible or involved in water use activities and activities associated in the Environmental Authorisations on site must receive training on the requirements of the Environmental Authorisations and relevant Environmental Legislation.							
									Quarterly internal audits must be undertaken during the construction phase, where after biannual audits can be undertaken, on the lawful implementation of the Environmental Authorisation.							
									A copy of the Water Use Licence (WUL) must be available on site at all times.							
Scheduling of Activity	Proactive Management on Surface Water Resources and Ecosystems	The construction of the trench during the wet season could lead to an increase in erosion and siltation of the downgradient Springkaanspruit	N	-3	-1	-5	-3	-12	The planning schedule for this project must take into consideration the rainfall patterns of this area. Construction of this project should be scheduled in the dry season and be completed before the wet season commences.	P	-1	-1	-1	5	2	CbA
									Prior to the commencement of construction activities, the existing Alien and Invasive Plant (AIP) Management/Control Plan should be updated and implemented: <ul style="list-style-type: none"> <li>The AIP Management/Control Plan should be implemented by a suitably trained individual. No chemical control of AIPs to occur without supervision by a certified professional;</li> <li>Removal of AIP species should preferably commence during the Pre-construction &amp; Planning phase (as per the current AIP Control Plan) and continue throughout all phases of the proposed storm water channel development; and</li> <li>Prior to the commencement of construction activities on site, the existing rehabilitation plan should be updated for implementation throughout the subsequent phases (i.e., to accommodate concurrent rehabilitation).</li> </ul>							
									A walkdown of the footprint area should take place prior to vegetation clearing and should be conducted by a suitably qualified specialist.							
		Potential failure to identify and relocate floral SCC (other than NFA protected species which have already been identified within the vicinity) to suitable habitat outside the development footprint. Note:	N	-4	-3	-2	-5	-14	Permits from the Limpopo Economic Development, Environmental and Tourism (LEDET) and/or authorisation from the Department of Forestry, Fisheries and the Environment (DFFE) should be obtained to remove, cut, or	P	-1	-1	-1	5	2	CbA



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Name of Activity		Potential Impacts	Rating Prior to Measures					Mitigation Type	Rating Post Measures					Significance		
Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/r
		previous field assessments indicated that no NFA protected marulas ( <i>Sclerocarya birrea subsp. caffra</i> ) are located within the footprint area or within 10 m of the proposed trench.							<p>destroy any provincially or nationally species before any vegetation clearing may take place.</p> <p>It is recommended that prior to the commencement of construction activities the entire construction servitude be clearly demarcated to limit footprint creep and edge effects – especially where encroachment into surrounding natural habitat can result in impacts on floral communities.</p> <p>The relocation of floral SCC or other species of conservation importance must take place prior to the commencement of vegetation clearing. Good record-keeping will be necessary to record this process, the species and numbers removed and/or relocated and to document all successes and failures associated with the relocation.</p> <p>It is recommended that for species that cannot be relocated (especially floral Species of Conservation Concern (SCC) if encountered), seedlings and/or seeds of these species are harvested from the development footprint area before clearing activities commence and grown under nursery conditions with the purpose to use these species for rehabilitation at a later stage.</p> <p>Design of infrastructure and layouts should be environmentally sound. The designs must adhere to all legislation requirements and all possible precautions taken to prevent potential spills and /or leaks, as well as unnecessary clearance of vegetation.</p> <p>At all times, ensure that sound environmental management is in place during the Pre-construction &amp; Planning Phase.</p> <p>Update and implement the existing AIP Management and Control plan, existing Rehabilitation Plan, and the existing Erosion Control Plan to include the proposed trench before the commencement of construction activities, which will result in the spread of AIPs from the development footprint to surrounding natural habitat or increase erosion potential.</p>							



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Table 29: Construction and Operational Phase Impact Assessment and Management Measures (Significance before Mitigation –SbM; Significance after Mitigation – SaM; Can be avoided – CbA; R – Reversible; Ir – Irreversible)

Name of Activity		Potential Impacts	Rating Prior to Measures					Mitigation Type	Rating Post Measures					Significance		
Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/Ir
Land and Footprint Clearance	Geology	No direct impact – Activities will not be constructed over future planned mining areas.	-	-	-	-	-	-		-	-	-	-	-	-	-
Topsoil Stripping and Stockpiling and Vegetation Removal	Topography	Direct impact: Alteration of topography. Removal of vegetation and the associated shaping of the area will lead to change in topographical characteristics of the area. The impact is not considered significant due to the fairly flat nature of the topography and the location of the activities in the immediate vicinity of the existing plant area and within an already disturbed area.	N	-1	-3	-3	-2	-9	The footprint areas of all surface infrastructure must remain as small as possible within the parameters of operational and engineering requirements.	N	-1	-1	-2	-1	-5	R
									Construction areas must be clearly demarcated to control movement of personnel and vehicles, providing clear boundaries for construction sites in order to limit the spread of impacts. Markers and pegs will be erected and maintained along the boundaries of the working areas before commencing any work. If proved insufficient for control, these shall be replaced by fencing.							
									Designs of the facilities must be undertaken by a registered Engineer.							
Soil, Land Use and Land Capability	Soil, Land Use and Land Capability	Direct impact: The removal and stockpiling of topsoil may lead to a loss of soil resource and land capability through erosion of the stockpiles and chemical and physical degradation.	N	-1	-3	-3	-3	-10	Adhere to Soil Stripping, Soil Stockpiling and Soil Management Plan as part of the original EMP (Soil Utilisation Guideline).	N	-1	-1	-2	-1	-5	R
									Topsoil should be stockpiled on designated topsoil stockpiles, unless around linear infrastructure, where the topsoil could be stockpiled next to the linear structure.							
									Topsoil must also be used to serve as a berm on the outer side of the channel. Stockpiles and berms should be revegetated to establish a vegetation cover as an erosion control measure. These stockpiles should also be kept free of AIPs at all times to prevent loss of soil quality.							
		Direct impact: Soil compaction.	N	-1	-4	-2	-2	-9	The contractor will ensure that all activities, material and equipment storage and personnel movement take place within the designated area. A site layout plan must be developed, indicating the following: ☞ Location of all approved activities. ☞ 1:100 year floodline and other buffers/ Zones of Regulation around all watercourses. ☞ Location of the CBA and Sensitive Areas and mark these areas where construction is not approved as no-go zones. ☞ All vegetation management zones as per the Biodiversity Action Plan.	N	-1	-1	-2	-1	-5	R



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Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr
									Laydown areas should be located within the existing North Mine Infrastructure area.							
									All contractors must receive induction. The induction should be updated on site, to make provision for the site layout plan and a detailed explanation on the purpose of the no-go zones, presence of threatened or protected species, presence of the CBAs and ESAs and the meeting the requirements of these areas.							
									A fine system/ disciplinary system must be implemented on site for all significant or recurring environmental non-compliances.							
		Direct impact: Clearing vegetation will result in the exposure of soil, which may in turn lead to soil erosion.	N	-1	-3	-2	-4	-10	Site clearance and activities should be restricted to the approved footprint.	N	-1	-1	-2	-1	-5	R
									Construct clean and dirty water separation as part of the site design.							
									The stormwater channel is proposed to be grassed which will assist to prevent erosion. Grassing must be undertaken immediately after construction. Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel.							
									Ensure the required erosion protection measures are monitored and corrected where necessary.							
									Natural vegetation establishment (self-succession) will be encouraged on cleared areas and topsoil stockpiles.							
									No construction or project related activities may be undertaken outside of the demarcated areas.							
									Energy dissipator systems must be implemented to reduce water runoff from this area. This will include water breaks, and vegetating the channel.							
									A fine system/ disciplinary system must be implemented on site for all significant or recurring environmental non-compliances.							
									Site clearance and activities should be restricted to the approved footprint. Contractors' areas should be established on already disturbed footprints.							
									Regular inspections should be undertaken along the channel as well as at the discharge point to monitor erosion and AIPs. Inspections sheets and photo-logs must be kept.							
Where erosion or the presence of AIPs are recorded, this must be rehabilitated as soon as practically possible.																
	Terrestrial Ecology (Fauna & Flora)	Specific Impacts Identified include: <ul style="list-style-type: none"> <li>Site clearing and the removal of vegetation considered to be representative of the Sensitive Ecosystems and CBA habitat.</li> <li>Potential failure to monitor the success of relocated floral SCC (where applicable).</li> </ul>	N	-2	-3	-2	-4	-11	Adhere to the measures presented under soil impacts.	N	-1	-1	-1	-2	-5	CbA
									Adhere to the measures presented under hydrological impacts (especially by implementing storm water management measures).							
									Adhere to the management measures presented for air quality management.							
									Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint – manage footprint encroachment into surrounding areas, especially as these areas provide natural habitat.							
									Where possible vegetation clearance and commencement of construction activities should either be scheduled to coincide with low rainfall conditions when erosive stormwater is anticipated to be limited or alternatively stormwater controls must be established at the start of construction and dust suppression implemented.							
									The footprint must be kept as small as possible to minimise impact on the surrounding environment (edge effect management). The approved footprint area must be demarcated to avoid unnecessary clearing and destructing of natural vegetation.							

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Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr
									<p>During the surveying and site-pegging phase of the project, an ecologist must identify whether any sensitive species are present and all floral SCC if present that will be affected must be marked and where possible, relocated to suitable habitat surrounding the disturbance footprint. The relevant tree and plant removal permits must be applied for with DFFE and/ or LEDET if required, prior to the construction phase.</p> <p>Clearing of vegetation should take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential. Should any floral species protected under the Limpopo Environmental Management Act (Act 7 of 2003) (LEMA) and National Forest Act (Act 84 of 1998) (NFA) be encountered within the proposed development footprint areas, permits should be obtained from LEDET and/ or DFFE to remove, cut or destroy any protected tree or plant species before construction of infrastructure takes place</p> <p>Prior to the removal of plant species, the mine should appoint an ecologist to monitor and oversee the removal of all identified threatened and/or protected species, which should be removed under tree/ plant removal permits.</p> <p>All such species should be demarcated by signage or tape.</p> <p>If possible, vegetation clearance and commencement of construction activities can be scheduled to coincide with low rainfall conditions when the erosive stormwater and wind are anticipated to be low.</p> <p>Natural vegetation establishment (self-succession) will be encouraged on cleared areas and topsoil stockpiles.</p> <p>No collection of firewood, floral species of conservation importance or medicinal floral species must be allowed by construction or mining personnel.</p> <p>A fine system/disciplinary system must be implemented on site for all significant or recurring environmental non-compliances.</p> <p>All employees, or contractors on site, involved in this project should receive a detailed induction on the expectations for the protection of fauna and flora on site.</p> <p>AIP species eradication should be implemented on site.</p>							
		Direct impact: Displacement of faunal species and human/animal conflict. Due to the fact that the site is located within an existing operation mining footprint, and directly adjacent to the plant, the impact is not regarded to be as significant as it would have been for a greenfields site.	N	-1	-1	-2	-2	-6	<p>A record of any animal fatalities should be kept on site. The reason for the fatality and action to avoid such in the future (if possible) should be stated.</p> <p>Construction and site clearance should be undertaken in a systematic approach to allow animals to relocate from the site where construction will take place.</p> <p>All employees, or contractors on site, involved in this project should receive a detailed induction on the expectations for the protection of fauna and flora on site.</p> <p>Clearance of vegetation must be undertaken in such a manner as to provide sufficient time for animals to relocate.</p>	N	-1	-1	-2	-1	-5	R
		Proliferation of AIP species that colonise in areas of increased disturbances and that outcompete native species, including the further transformation of adjacent natural habitat.	N	-2	-4	-5	-1	-12	<p>Alien and invasive plant species eradication should be implemented on site.</p> <p>Areas of construction must be clearly demarcated.</p> <p>No construction or project related activities may be undertaken outside of the demarcated areas.</p>	N	-1	-1	-2	-1	-5	R
		Additional pressure on floral habitat by increased human movement associated	N	-2	-4	-5	-1	-12	<p>It is recommended that all construction personnel be educated in environmental awareness.</p>	N	-1	-1	-2	-1	-5	CbA





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Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr
		<p>with the proposed construction activities, including increased vehicular movement, contributing to:</p> <ul style="list-style-type: none"> <li>Increased introduction and spread of AIPs; and</li> <li>Increased risk of fire frequency.</li> </ul> <p>The above could lead to a loss of sensitive floral habitat and the potential loss of floral SCC.</p>							<p>Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities.</p> <p>It is recommended that existing roads be utilised and the construction of new roads minimised.</p> <p>Any unauthorised collection of floral material must be prohibited.</p> <p>Harvesting of protected floral species by construction personnel should be strictly prohibited.</p>							
		<p>Dumping of overburden outside of designated areas, promoting the establishment of AIPs, could lead to the loss of floral habitat, diversity, and SCC through displacement by AIPs.</p>	N	-2	-4	-5	-1	-12	<p>No illicit fires must be allowed during the construction of the proposed development.</p> <p>No dumping of litter, rubble or cleared vegetation on site should be allowed. Rubble removed because of the excavation activities can be disposed of at one of the mines waste rock dumps – no excavated material to be dumped in the development footprint. No temporary dump sites should be allowed in areas with natural vegetation. Waste disposal containers and bins should be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be mulched and composted at the mine's nursery.</p>	N	-1	-1	-2	-1	-5	CbA
		<p>Potentially poorly managed edge effects:</p> <ul style="list-style-type: none"> <li>Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to the continual proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat; and</li> <li>Compaction of soils outside of the development footprint due to indiscriminate driving of construction vehicles through natural vegetation.</li> </ul> <p>The above could lead to a loss of floral habitat, diversity, and SCC within the direct footprint of the proposed development. Loss of surrounding floral diversity and floral SCC through the displacement of indigenous flora by AIP species - especially in response to disturbance in natural areas.</p>	N	-2	-4	-5	-1	-12	<p>Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area, should self-succession not be successful.</p> <p>To limit edge effect impacts to the surrounding natural habitat, the below must be considered:</p> <ul style="list-style-type: none"> <li>No construction rubble to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility;</li> <li>All soils compacted as a result of construction activities should be ripped, profiled and reseeded;</li> <li>Minimise the risk of erosion by limiting the extent of disturbed vegetation and exposed soil. Where construction activities have impacted habitat surrounding the berm, these areas should be levelled and revegetated with a mix of indigenous grass species. It should be ensured that the berms are structurally sound; and</li> <li>Manage the spread of AIP species which may affect remaining natural habitat within surrounding areas.</li> </ul>	N	-1	-1	-2	-1	-5	CbA
		<p>Direct and Cumulative Impact: Habitat degradation due to dust. Increased dust will occur in all areas where vegetation is cleared. Dust will be caused by excavation, and construction. Dust in the area will be greatly increased due to the dry weather conditions and the nature of the soil in the</p>	N	-1	-2	-2	-2	-7	<p>Maintain the current air quality monitoring stations that determine fallout and implemented respirable dust (PM10) monitoring that could arise from the activities.</p> <p>Implement dust suppression in and around the construction area where required.</p>	N	-1	-1	-2	-1	-5	CbA



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Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr
		area. Dust settling on plant material can reduce the amount of light reaching the chlorophyll in the leaves, thereby reducing photosynthesis, which in turn reduces plant productivity, growth and recruitment.														
	Riparian Habitat	Impact on the movement of construction vehicles on the riparian habitat associated with the Springkaanspruit.	N	-3	-2	-2	-3	-10	<p>Ensure that the surface infrastructure footprint does not encroach on freshwater resource habitats and that vegetation clearing is limited to essential areas only.</p> <p>Energy dissipation measures must be implemented along the channels and also at the discharge point, upgradient of the 1:100 year floodline to reduce water velocity.</p> <p>Ongoing Aquatic Biodiversity Monitoring should be undertaken at the upstream and downstream points at perennial water systems.</p> <p>Ongoing surface water monitoring should be undertaken at the upstream and downstream monitoring points.</p> <p>Implement and maintain an AIP management and control programme.</p>	N	-1	-1	-1	-2	-5	CbA
	Hydrology	Direct impact: The removal of vegetation can lead to increased surface runoff, which may in turn alter natural surface water flows and increase siltation of watercourses as well as pollution control facilities.	N	-3	-2	-2	-3	-10	<p>Rehabilitate open areas as soon as practically possible. Self-succession should be encouraged. If natural succession of vegetation is not established within one rainy season, after rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, and to minimise soil erosion and dust emission.</p> <p>The stormwater channel is proposed to be grassed which will assist to prevent erosion. Grassing must be undertaken immediately after construction.</p> <p>Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel.</p> <p>Regular monitoring of the channel should be undertaken, specifically in the wet season and after large storm events. The channel should be repaired immediately if damaged.</p> <p>Limit the areas to be cleared to the demarcated sites.</p>	N	-1	-1	-1	-2	-5	CbA
	Geohydrology	No direct impact during the construction phase.	-	-	-	-	-	-		-	-	-	-	-	-	-
	Heritage	No direct impact during the construction phase are expected.	N	-3	-2	-2	-2	-9	<p>The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.</p> <p>This procedure applies to the mine's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be</p>	N	-1	-1	-2	3	-1	CbA



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Name of Activity		Potential Impacts	Rating Prior to Measures						Mitigation Type	Rating Post Measures					Significance				
Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr			
									<p>properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.</p> <ul style="list-style-type: none"> <li>If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.</li> <li>It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.</li> <li>The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.</li> </ul>										
	Visual	Direct impact: soil stripping and footprint clearance.	N	-1	-2	-1	0	-4	Stripping of vegetation and soils should be undertaken within the demarcated areas only.	N	-1	-1	-1	0	-3	R			
	Air Quality	Direct impact: Dust-fallout.	N	-2	-2	-3	-2	-9	<p>Utilise the existing monitoring network to monitor dust fall out in and around the construction area.</p> <p>Strictly enforced speed limits on all roads.</p> <p>Maintain a complaints register should stakeholders need to raise concerns.</p> <p>Complaints raised must be acknowledged within 24 hours and addressed within an agreed timeframe.</p> <p>All remaining open temporary areas should be rehabilitated once construction has been completed.</p> <p>Bare soils can be regularly dampened with water to suppress dust during the construction phase, especially when strong wind conditions are predicted according to the local weather forecast.</p> <p>Limit site clearance to designated areas.</p>	N	-1	-1	-2	-1	-5	CbA			
	Noise	The area is located within the existing truck parking area. Noise impacts are not considered to be significant but can occur during excavation and construction activities.	N	-1	-2	-1	-1	-5	<p>Equipment will be well maintained to reduce excessive noise creation.</p> <p>Activities will be restricted to the daytime.</p>	N	-1	-1	-1	-1	-4	CbA			
	Social	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Geology	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Topography	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<b>Waste Management and Handling</b> Hydrocarbon spills within the project area and the management of domestic and hazardous waste	Soils	Contamination of soil resources due to hydrocarbon spills.	N	-1	-2	-4	-4	-11	<p>Storage of fuels and oils, the refuelling of vehicles and equipment maintenance must be limited to designated, bunded areas. Bunds to be 110% of volume of the materials stored.</p> <p>All fuels and soils must be stored in appropriate containers.</p> <p>Chemicals and hazardous material must be stored in suitable containers, fit for purpose and in line with Material Safety Data Sheet (MSDS) requirements.</p> <p>Where drip trays are too small, specially prepared, non-pervious bunds with solution trenches must be used to capture spillages.</p>	N	-1	-2	-1	-1	-5	CbA			





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Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr
									<p>Oils and potentially hazardous materials must be disposed of at a licensed facility and waste certificates obtained.</p> <p>A spill kit must be provided to be used in the event of a spill.</p> <p>A spill kit must be provided to be used in the event of a spill.</p> <p>If a spill occurs, the contaminated soil must be removed immediately. Contaminated soil must be stored according to best practices until it can be disposed of at a suitably licensed facility.</p> <p>Safety signage must be used at designated storage areas.</p> <p>All workers must undergo an induction which includes environmental awareness training to make them aware of the environmental incident management procedures as well as the importance of complying with management measures.</p>							
		Contamination of soils as a result of a lack of sanitary services.	N	-1	-2	-4	-4	-11	<p>Chemical toilets must be readily available to employees where permanent infrastructure is not available.</p> <p>Licensed companies must be appointed to remove any contaminated material and or wastes to licensed landfill sites.</p>	-	-1	-2	-1	-1	-5	CbA
	Ecology	The unmanaged disposal of waste, could result in the spread of invader species, as well as the influx of opportunistic species.	N	-2	-3	-3	-4	-12	<p>Develop dedicated waste handling areas; prevent access to rodents and opportunistic species; prevent the spread of waste.</p> <p>Develop dedicated waste handling areas, fit for purpose and prevent the spread of waste.</p>	N	-1	-1	-2	-1	-5	CbA
	Riparian Habitat	The construction activities are in close proximity to the Springkaanspruit and its associated riparian zone.	N	-3	-2	-3	-3	-11	<p>Remain at all times outside of the 1:100 year flood line of the Springkaanspruit unless approved in terms of the necessary legislation.</p> <p>No waste is permitted to be disposed of within any freshwater habitat, and it must be ensured that all waste is removed to an appropriate disposal facility.</p> <p>Ongoing aquatic biomonitoring should be undertaken at the upstream and downstream points of perennial point sources.</p> <p>Ongoing surface water monitoring should be undertaken at the upstream and downstream monitoring points.</p> <p>Develop dedicated waste handling areas, fit for purpose and prevent the spread of waste.</p>	N	-1	-1	-1	-2	-5	CbA
	Surface Water	Handling of hazardous waste (such as contaminated soils) could contaminate the dirty water storage areas.	N	-3	-2	-2	-4	-11	<p>Clean and dirty water separation systems should be incorporated into the designs.</p> <p>A detailed waste management strategy will be established and implemented, which will clearly demarcate the containments for different waste streams.</p> <p>Waste management training must be implemented on site.</p> <p>Clear signs informing staff of waste management practices must be implemented on site.</p> <p>Hazardous waste handling should only take place within bunded and/or lined areas.</p> <p>Hazardous waste should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site.</p> <p>Clean spills, if spills occur, within 24 hours.</p> <p>Documentation of removal and safe disposal must be available on site.</p> <p>The mine will adopt a cradle-to grave approach to ensure that the waste is removed and disposed of in a legally compliant manner.</p>	N	-1	-1	-2	-1	-5	CbA



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Activities	Impact Area	Potential Impacts	Status	Extent	Duration	Probability	Intensity	SbM	Mitigation Measures	Status	Extent	Duration	Probability	Intensity	SaM	CbA/R/lr
									Notify the relevant regulatory authorities in the event of the occurrence of a reportable incident.							
									Weekly inspections of storm water management systems must be undertaken. Any blockages or maintenance requirements must be documented, and an action plan developed.							
		Handling and storing of domestic waste should have no impact on the surface water resources due to the location of the facility. However, incorrect disposal of waste could hamper the integrity of the storm water system.	N/A	-1	-2	-3	-3	-9	Clean and dirty water separation systems should be incorporated in terms of the clean and dirty water system or any approved update thereafter.	N	-1	-1	-2	-1	-5	CbA
									Waste management training must be implemented on site.							
									Weekly inspections of storm water management systems must be undertaken. Any blockages or maintenance requirements must be documented, and an action plan developed.							
									Clear signs informing staff of waste management practices must be implemented on site.							
									Access control must be strictly enforced.							
									Waste should be disposed of by licensed companies to licensed facilities.							
									Recycling practices must be investigated and implemented on site.							
									Clean and dirty water separation systems should be incorporated in terms of the clean and dirty water system or any approved update thereafter.							
The area should have suitable waste bins during construction and decommissioning practices.																
Groundwater	Handling of hazardous waste within the construction area.	N	-2	-2	-2	-2	-8	N	-1	-1	-2	-1	-5	CbA		
							Waste management training must be implemented on site.									
							Clear signs informing staff of waste management practices must be implemented on site.									
							Hazardous waste handling should only take place within bunded and/or lined areas, with a capacity of at least 110% of the volume stored.									
							Hazardous waste should be removed by a licensed removal company and taken to a suitable and licensed landfill site.									
							Documentation of removal and safe disposal must be available on site.									
Air Quality	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Heritage	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Noise	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Visual	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Social	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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Table 30: Decommissioning and Closure Phase Impact Assessment and Management Measures (Significance before Mitigation –SbM; Significance after Mitigation – SaM; Can be avoided – CbA; R – Reversible; Ir - Irreversible)

Name of Activity	Impact Area	Potential Impacts	Rating Prior to Measures						SbM	Mitigation Type	Rating Post Measures						Significance																	
			St	at	Ex	te	Du	rat			Pr	ob	Int	en	St	at	Ex	te	Du	rat	Pr	ob	Int	en	SaM	CbA/R/Ir								
Legal Requirements (Environmental Authorisations)	Legal Compliance	Unlawful activities could lead to NWA Directives and NEMA Section 24G Rectification fines.	N	-4	-3	-2	-5	-14	<p>A legal assessment of all activities must be undertaken annually to ensure that all activities are licensed.</p> <p>A detailed closure plan must be developed and submitted to the relevant departments for approval.</p> <p>All legally appointed personnel responsible or involved in activities on site must receive training on the requirements of the Environmental Authorisations and EMPs</p> <p>Quarterly decommissioning internal audits must be undertaken, on the lawful implementation of the Environmental Authorisation</p> <p>Copies of Environmental Authorisations must be available on site at all times.</p> <p>To ensure that the conditions of the NWA and associated WUL are met, the channel may only be removed once the dirty water area has been rehabilitated.</p> <p>The legal register must be updated to indicate all updated activities.</p>	P	4	3	5	5	17	CbA																		
			-	0	0	0	0	0									-	-	-	-	-	-	-											
			P	1	3	4	5	13									<p>Suitable landscape topography should be reasonably restored through shaping and landscaping, such that the topography of rehabilitated areas will ultimately be commensurate with that of adjacent, non-disturbed areas.</p> <p>The final shaping should be viable to allow for potential agricultural activities and grazing opportunities post-mining. If possible, ensure a continuation of the pre-mining surface drainage pattern.</p>	-	1	3	5	5	14	-										
			N	-6	-3	-4	-3	-16																	<p>Revegetate as soon as possible should self-succession not be suitable.</p> <p>Compacted soils will be ripped, and topsoil will be replaced. After the topsoil has been replaced the area should be ameliorated and seeded, should self-succession of vegetation not take place. Only species indigenous to the area will be included.</p>	N	-2	-1	-3	1	-5	CbA		
			Earth moving, shaping and ripping of ground	Geology	No direct impact.	-	0	0									0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Topography	The shaping of the site should be undertaken in such a manner that it improves the overall topography of the site.	P	1	3									4	5	13	<p>The soil fertility status should be determined by soil chemical analysis after levelling (before seeding/re-vegetation). Soil amelioration should be done according to soil analyses as recommended by a soil specialist, to correct the pH and nutrition status before revegetation.</p> <p>Where sites have been alienated of vegetation or where soils have been compacted or covered with concretes, these sites will be ripped and ploughed.</p> <p>The topsoil and sub-soils with the appropriate seedbed as stripped during the construction phases will be placed over these areas to a depth as specified by a qualified specialist. The topsoil shall be appropriately ameliorated to allow vegetation to grow rapidly if required – it should be noted that the mine will encourage self-succession of vegetation, if this does not take place effectively a re-vegetation project will be implemented</p>	P	1	3	5	5	14	CbA							
Soils	Ripping and topsoil replacement will restore the soil physical characteristics prior to re-vegetation.	P		1	3	4	5	13	<p>No additional habitat is to be disturbed during the Decommissioning &amp; Rehabilitation Phase of the development.</p> <p>No vehicles are allowed to indiscriminately drive through sensitive habitat and natural areas.</p>	P	3	3	3	4	13	CbA																		
Terrestrial Ecology (Fauna & Flora)	The rehabilitation of the site will allow reestablishment of natural vegetation.	P	1	2	3	4	10																											

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Name of Activity	Impact Area	Potential Impacts	Rating Prior to Measures						SbM	Mitigation Type	Rating Post Measures						Significance											
			St	at	Ex	te	Du	rat			Pr	ob	Int	en	St	at	Ex	te	Du	rat	Pr	ob	Int	en	SaM	CbA/R/Ir		
										During the decommissioning, the decommissioning of temporary access roads or infrastructure including the proposed stormwater channel) should be implemented. All impacted and disturbed areas should be ripped, reprofiled and reseeded with indigenous species from the region that will assist to stabilise soils as soon as possible. All infrastructure footprints that will be decommissioned should be concurrently rehabilitated in accordance with a rehabilitation plan compiled by a suitably trained specialist. All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be re-instated as per the post-closure land-use objective. Rehabilitation efforts must be implemented for a period of at least five years after decommissioning. A mix of indigenous grass seeds can be used during rehabilitation activities, should self-succession not be successful. Monitoring of rescued and relocated floral species of conservation importance should continue during the Decommissioning & Rehabilitation phase until it is evident that the species have successfully established. As far as possible, no collection of floral species within the adjacent natural habitat must be allowed during the Decommissioning & Rehabilitation phase of the development. Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC or suitable habitat for such species outside of the proposed development footprint.																		
	Wetland	No direct impact.	-	-	-	-	-	-	-																			
	Hydrology	Runoff from rehabilitated areas will impact on the Springkaanspruit especially during intensive rainstorms especially if the area is not free draining.	N	-2	-1	-3	1	-5		The areas will be landscaped to be free draining. Berms, should they be necessary, must remain upstream and downstream of the areas to ensure that clean water is kept separate from dirty water until the area is free draining and re-vegetation has occurred.	P	3	3	3	4	13									CbA			
	Geohydrology	No direct impact.	-	-	-	-	-	-	-																			
	Heritage	No direct impact.	-	-	-	-	-	-	-																			
	Visual	The rehabilitation (ripping, topsoil replacement and landscaping) will remove the visual incongruity.	P	2	4	4	1	11		An overall visual improvement will be noticed once all mining related infrastructure has been demolished and the area has been shaped and vegetation re-established.	P	2	4	4	3	13									CbA			







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Name of Activity	Impact Area	Potential Impacts	Rating Prior to Measures							Mitigation Type	Rating Post Measures					Significance	
			St at	Ex te	Du rat	Pr ob	Int en	SbM	St at		Ex te	Du rat	Pr ob	Int en	SaM	CbA/R/Ir	
	Terrestrial Ecology (Fauna & Flora)	No direct impact	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Wetland	No direct impact	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Groundwater	Handling of hazardous waste.	N	-2	-2	-2	-4	-10	Clean and dirty water separation systems should be maintained until rehabilitation has been successful.	N	-1	-1	-2	-2	-6	CbA	
									Waste management training must be implemented on site.								
									Clear signs informing staff of waste management practices must be implemented on site.								
									Hazardous waste handling should only take place within bunded and/or lined areas.								
	Groundwater	Handling of building rubble.	N	-2	-2	-2	-3	-9	All infrastructure will be removed and rehabilitated, should no alternative use be found for the structures.	N	-1	-1	-2	-2	-6	CbA	
									Foundations will be removed to a depth of 500mm below surface.								
									All building rubble will follow the waste hierarchy and will therefore either be sold for reuse where possible and as a last option be disposed of at a licensed facility suitable for such waste.								
	Surface Water	Handling and storing of domestic waste.	N	-3	-3	-3	-3	-12	Clean and dirty water separation systems should be maintained up until rehabilitation has been successful.	N	-2	-3	-2	-2	-9	CbA	
									Waste management training must be implemented on site.								
									Clear signs informing staff of waste management practices must be implemented on site.								
									Groundwater monitoring must be undertaken in such a manner as to ensure that any potential impacts from the site can be detected.								
	Surface Water	Handling of hazardous waste within could contaminate the dirty water storage areas. The water is then reused in the system and could have impacts on the integrity of the storm water system and also the production.	N	-3	-2	-2	-4	-11	Clean and dirty water separation systems should be maintained up until closure.	N	-1	-1	-2	-2	-6	CbA	
									Waste management training must be implemented on site.								
									Clear signs informing staff of waste management practices must be implemented on site.								
									Hazardous waste handling should only take place within bunded and/or lined areas.								
									Hazardous waste and contaminated materials should be removed by a licensed removal company and taken to a suitable and licensed landfill site.								
									Documentation of removal and safe disposal must be available on site.								
Weekly inspections of storm water management systems must be undertaken until successful rehabilitation has been achieved. Any blockages or maintenance requirements must be documented, and an action plan developed.																	
		Handling and storing of domestic waste should have no impact on the surface water	N/A	-1	-2	-3	-3	-9	Clean and dirty water separation systems should be maintained up until closure.	N	-1	-1	-2	-1	-5	CbA	



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			St	at	Ex	te	Du	rat	Pr		ob	Int	en	SbM	St	at	Ex	te	Du	rat	Pr	ob	Int	en	SaM
		resources due to the location of the facility. However, incorrect disposal of waste could hamper the integrity of the storm water system.										Waste management training must be implemented on site.													
												Weekly inspections of storm water management systems must be undertaken. Any blockages or maintenance requirements must be documented, and an action plan developed.													
												Clear signs informing staff of waste management practices must be implemented on site.													
												Recycling practices must be investigated and implemented on site.													
												Building rubble must be disposed of in line with the requirements of the NEMWA.													
												Access control must be strictly enforced.													
	Air Quality	No direct impact.	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
	Heritage	No direct impact.	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
	Visual	No direct impact.	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
	Air Quality	No direct impact.	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
	Noise	No direct impact.	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
	Social	No direct impact.	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-

### 3.i.xiii The Positive and Negative Impacts that the Proposed Activity

The following positive impacts are foreseen:

- ☛ The project will allow for clean and dirty water management around the North Mine Infrastructure.

Please refer to Table 28 to Table 30 for the detailed impact and management discussion associated with the project.

The project is implemented to manage water resources. For this reason limited negative impacts are foreseen with the implementation of the correct management measures. The key areas to monitor would be soil erosion, the velocity of water flow and impact on the ecological setting.

Key areas of management in terms of water resources and soil management will require:

- ☛ Construction activities to be undertaken during the dry season;
- ☛ The stabilisation of the channel with the planting of indigenous grasses (active revegetation), and the implementation of energy dissipaters, especially horizontally across the channel to ensure that grass establishment can take place;
- ☛ Energy dissipaters at the discharge point of the clean water, which will be located outside of the 1:100 year floodline.

As the only direct impact is on ecology, this section will provide more details based on the discussions presented in Table 28 to Table 30.

The direct impact of the proposed trench development on the floral ecology is anticipated to vary between low and very low prior to the implementation of mitigation measures. If mitigation measures are implemented, the impact significance for the proposed trench development are anticipated to reduce.

Prior to mitigation measures the i) Pre-construction & Planning Phase, ii) Construction and Operational Phase and iii) Decommissioning & Rehabilitation Phase scored an impact significance as follows:

- ☛ Pre-construction & Planning Phase: This phase scored an impact of low;
- ☛ Construction and Operational Phase: This phase scored an impact significance of medium-low to low; and
- ☛ Decommissioning & Rehabilitation Phase: This phase scored an impact significance of low.

With mitigation measures implemented, the direct and indirect impacts on the floral ecology for the identified roads may be reduced as follows:

- ☛ Pre-construction & Planning Phase: With the implementation of mitigation measures, this phase scored a lowered impact significance of very low;
- ☛ Construction and Operational Phase: With the implementation of mitigation measures, this phase scored a lower impact significance of medium-low to very low; and
- ☛ Decommissioning & Rehabilitation Phase: With the implementation of mitigation measures, this phase scored a lowered impact significance of very low.

As part of the proposed mitigation measures, all disturbed areas, including areas not within the development footprint, must be rehabilitated appropriately and AIP establishment controlled within such areas.

#### Impact on Floral Habitat and Diversity

The data gathered during the site visit and from the reviewed studies indicate that the Mixed Bushveld Habitat is of intermediate sensitivity. The most significant impacts deemed likely to affect the floral habitat integrity and species diversity within the proposed development footprint include, but are not limited to, the following:

- ☛ Loss of indigenous floral habitat and diversity resulting from vegetation clearing activities;
- ☛ AIP proliferation into adjacent natural vegetation displacing indigenous flora and altering favourable habitat conditions for the establishment of indigenous species.

#### Impacts on Floral Species of Conservation Importance

Suitable habitat for an array of floral species of conservation importance is available within the Mixed Bushveld Habitat. Such species include threatened species, nationally protected species as per the NFA, NEMBA TOPS as





per the 2023 regulations, and/or provincially protected species as per the LEMA. It should be noted that during the field assessment conducted during August 2022 (which focused on identifying and characterising NFA protected *Sclerocarya birrea subsp. caffra* individuals in the surrounding areas) were not observed within this footprint area.

It is advised that a walkthrough of the project footprint areas be conducted before the commencement of any development or construction activities. Should any species of conservation importance be encountered within this footprint area these must be rescued and relocated by a suitably qualified specialist either to suitable habitat (outside the development footprint) or moved to the mine's nursery or registered nurseries such as the Agricultural Research Council (ARC) or the South African National Biodiversity Institute (SANBI). Permits must be obtained from the relevant authorities to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

#### Impact on CBAs, ESAs, Threatened Vegetation and Protected Areas

Although the proposed storm water channel development is located within significant biodiversity features, e.g., within CBA1 habitat and within a previously Threatened Ecosystem (namely the Sekhukhune Mountainlands ecosystem), the scale of the proposed development and therefore the associated impacts are expected to be less significant and unlikely to alter the function of the ecosystem, provided that strict implementation of proposed mitigation measures occurs. The surrounding natural vegetation within the local region is unlikely to be impacted by the proposed development if mitigation measures and monitoring is implemented.

#### Impact on hydrological resources

The following provides a summary of the key findings of the study:

- ☞ In terms of the GN704 regulated zones, it was found that all of the proposed infrastructure falls within the 100 m watercourse buffer; and
- ☞ The impact/risk assessment showed that all of the risks would have a medium significance pre-mitigation and a low significance post-mitigation.

The following is recommended:

- ☞ It is recommended that the proposed infrastructure that falls within the 100 m watercourse buffer, is motivated to be exempted from GN704;
- ☞ Vegetation clearance should be kept to an absolute minimum.
- ☞ Temporary erosion measures should be employed at exposed areas.
- ☞ Exposed areas should be vegetated as soon as possible.
- ☞ The stormwater channel is proposed to be grassed which will assist to prevent erosion.
- ☞ Grassing must be undertaken immediately after construction.
- ☞ Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel.
- ☞ Regular monitoring of the channel should be undertaken, specifically in the wet season and after large storm events.
- ☞ The channel should be repaired immediately if damaged.

#### Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving floral ecological environment are deemed likely. The following points highlight the key latent impacts that have been identified:

- ☞ Loss of floral habitat within the footprint area;
- ☞ Loss of natural habitat associated with the surrounding areas and CBA1 due to edge effects;
- ☞ Loss of floral species diversity with the footprint area; and
- ☞ Continued AIP proliferation within the disturbance footprint and spread of these into adjacent vegetation communities.

#### Cumulative Impacts

The greatest threat to the floral ecology within the surrounding area of the proposed project, apart from loss to mining expansion include the continued proliferation of AIP species, which may contribute towards loss of indigenous floral communities within the local area. It should be noted that despite current, isolated footprint, if



additional developments occur in this ecosystem and/or CBA then impacts on surrounding natural and CBA would need to be carefully considered.

### *3.i.xiv Motivation where no alternative sites were considered*

Please refer to Section 3.g and Section 3.h.

### *3.i.xv Statement Motivating the Alternative Development Location within the overall Site*

An existing storm water channel is present on site. Due to the expansion of the North Mine infrastructure, rerouting and upgrades to this channel are required.

The storm water channel is being upgraded upgradient of existing infrastructure in accordance with design drawings. The only alternative is the no-go alternative. By not implementing the upgrade, the DCM will not be able to give effect to managing activities in line with GN704 (clean and dirty water separation). Another consideration by not implementing this project, is potential safety hazards due to flooding of the infrastructure should the clean water not be routed around the activities.

## **3.j Full Description of the Process undertaken to Identify, Assess and Rank the Impacts and Risks the Activity will Impose on the preferred Site (In respect of the Final Site Layout Plan) through the Life of the Activity**

In order to identify the potential impacts associated with the proposed activities the following steps were undertaken:

- ☛ The stakeholder consultation process is undertaken in a manner to be interactive, providing landowners and identified stakeholders with the opportunity to provide input into the project. This is a key focus, as the local residents have the capability to provide site specific information, which may not be available in desktop research material. Stakeholders are requested (as part of the BID) to provide their views on the project and any potential concerns which they may have. All comments and concerns received to date, have been captured and formulated into the impact assessment.
- ☛ Various Environmental Studies have been undertaken in the past for a number of projects at the mine. These include the MPRDA EMP, EMP Alignment, various Basic Assessment Processes, etc. on the portions of land applicable to this project. The baseline specialist studies prepared for the 2018 EIA process, which broadly involved resource and reserve drilling, various Capital Projects throughout the Mining Right Area, and the establishment of diesel storage tanks, together with the impact findings were considered as part of this Basic Assessment process and incorporated into the assessment of impacts and the ranking of these.
- ☛ In addition to the above, a desktop hydrological assessment, Phase 1 Heritage Assessment and a Listed Ecosystem Verification and Impact Assessment was conducted (see Annexure 3).
- ☛ In addition to information obtained from existing specialist studies, a detailed desktop investigation was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations, various resources were used to determine the significance and sensitivity of the various environmental considerations. The desktop investigation involved the use of:
  - South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database Land Use Decision Support (LUDS) system;
  - DFFE National Screening Tool Assessment;
  - SANBI's Biodiversity Geographic Information System (BGIS) base maps;
  - DWS information documents such as the Internal Strategic Perspective (ISP) and Groundwater Vulnerability Reports;
  - Agricultural GIS database;
  - Municipal IDPs; etc.
  - Site visits were undertaken in March 2023. This site visits were utilised to ensure that the information gathered as part of the desktop investigation reflects the current status of the land.
- ☛ The rating of the identified impacts was undertaken in a quantitative manner as provided in Section 3.i.xi.1 (Impact Ratings). The ratings are undertaken in a manner to calculate the significance of each of



the impacts. The EAP also assessed the outcomes of the calculation to determine whether the outcome reflects the perceived and actual views.

- ☛ The identification of management measures is done based on the significance of the impacts and measures that have been considered appropriate and successful, specifically as Best Practical and Economical Options.

### 3.k Assessment of Each Identified Potential Significant Impact and Risk

The assessment of the impacts is presented in Table 28 to Table 30.

### 3.l Summary of Specialist Reports

Please refer to Section 3.i.xiii for the outcomes of the specialist reports.

### 3.m Environmental Impact Statement

#### 3.m.i Summary of the Key Findings of the Environmental Impact Assessment

The proposed project relating to the current Environmental Authorisation process involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining infrastructure at North Shaft. The purpose of the stormwater trench at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine's operational areas. This is a condition in terms of the approved WUL Ref 24053346, dated 21 January 2008, which states that: *Storm water at the plant area shall be managed in accordance with Government Notice 704 and storm water leaving the premises shall in no ways be contaminated by any substance.*

No location alternatives were investigated for this project. The storm water channel is being upgraded upgradient of existing infrastructure in accordance with design drawings. The only alternative is the no-go alternative. By not implementing the upgrade, the Licence Holder will not be able to give effect to managing activities in line with GN704 (clean and dirty water separation). Another consideration by not implementing this project, is potential safety hazards due to flooding of the infrastructure should the clean water not be routed around the activities.

#### 3.m.i.1 Direct Impacts

The following positive impacts are foreseen:

- ☛ The project will allow for clean and dirty water management around the North Mine Infrastructure.

Please refer to Table 28 to Table 30 for the detailed impact and management discussion associated with the project.

The project is implemented to manage water resources. For this reason limited negative impacts are foreseen with the implementation of the correct management measures. The key areas to monitor would be soil erosion, the velocity of water flow and impact on the ecological setting.

Key areas of management in terms of water resources and soil management will require:

- ☛ Construction activities to be undertaken during the dry season;
- ☛ The stabilisation of the channel with the planting of indigenous grasses (active revegetation), and the implementation of energy dissipaters, especially horizontally across the channel to ensure that grass establishment can take place;
- ☛ Energy dissipaters at the discharge point of the clean water, which will be located outside of the 1:100 year floodline.

As the only direct impact is on ecology, this section will provide more details based on the discussions presented in Table 28 to Table 30.



The direct impact of the proposed trench development on the floral ecology is anticipated to vary between low and very low prior to the implementation of mitigation measures. If mitigation measures are implemented, the impact significance for the proposed trench development are anticipated to reduce.

Prior to mitigation measures the i) Pre-construction & Planning Phase, ii) Construction and Operational Phase and iii) Decommissioning & Rehabilitation Phase scored an impact significance as follows:

- ☞ Pre-construction & Planning Phase: This phase scored an impact of low;
- ☞ Construction and Operational Phase: This phase scored an impact significance of medium-low to low; and
- ☞ Decommissioning & Rehabilitation Phase: This phase scored an impact significance of low.

With mitigation measures implemented, the direct and indirect impacts on the floral ecology for the identified roads may be reduced as follows:

- ☞ Pre-construction & Planning Phase: With the implementation of mitigation measures, this phase scored a lowered impact significance of very low;
- ☞ Construction and Operational Phase: With the implementation of mitigation measures, this phase scored a lower impact significance of medium-low to very low; and
- ☞ Decommissioning & Rehabilitation Phase: With the implementation of mitigation measures, this phase scored a lowered impact significance of very low.

As part of the proposed mitigation measures, all disturbed areas, including areas not within the development footprint, must be rehabilitated appropriately and AIP establishment controlled within such areas.

#### Impact on Floral Habitat and Diversity

The data gathered during the site visit and from the reviewed studies indicate that the Mixed Bushveld Habitat is of intermediate sensitivity. The most significant impacts deemed likely to affect the floral habitat integrity and species diversity within the proposed development footprint include, but are not limited to, the following:

- ☞ Loss of indigenous floral habitat and diversity resulting from vegetation clearing activities;
- ☞ AIP proliferation into adjacent natural vegetation displacing indigenous flora and altering favourable habitat conditions for the establishment of indigenous species.

#### Impacts on Floral Species of Conservation Importance

Suitable habitat for an array of floral species of conservation importance is available within the Mixed Bushveld Habitat. Such species include threatened species, nationally protected species as per the NFA, NEMBA TOPS as per the 2023 regulations, and/or provincially protected species as per the LEMA. It should be noted that during the field assessment conducted during August 2022 (which focused on identifying and characterising NFA protected *Sclerocarya birrea subsp. caffra* individuals in the surrounding areas) were not observed within this footprint area.

It is advised that a walkthrough of the project footprint areas be conducted before the commencement of any development or construction activities. Should any species of conservation importance be encountered within this footprint area these must be rescued and relocated by a suitably qualified specialist either to suitable habitat (outside the development footprint) or moved to the mine's nursery or registered nurseries such as the Agricultural Research Council (ARC) or the South African National Biodiversity Institute (SANBI). Permits must be obtained from the relevant authorities to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

#### Impact on CBAs, ESAs, Threatened Vegetation and Protected Areas

Although the proposed storm water channel development is located within significant biodiversity features, e.g., within CBA1 habitat and within a previously Threatened Ecosystem (namely the Sekhukhune Mountainlands ecosystem), the scale of the proposed development and therefore the associated impacts are expected to be less significant and unlikely to alter the function of the ecosystem, provided that strict implementation of proposed mitigation measures occurs. The surrounding natural vegetation within the local region is unlikely to be impacted by the proposed development if mitigation measures and monitoring is implemented.

#### Impact on hydrological resources

The following provides a summary of the key findings of the study:





- ☞ In terms of the GN704 regulated zones, it was found that all of the proposed infrastructure falls within the 100 m watercourse buffer; and
- ☞ The impact/risk assessment showed that all of the risks would have a medium significance pre-mitigation and a low significance post-mitigation.

The following is recommended:

- ☞ It is recommended that the proposed infrastructure that falls within the 100 m watercourse buffer, is motivated to be exempted from GN704;
- ☞ Vegetation clearance should be kept to an absolute minimum.
- ☞ Temporary erosion measures should be employed at exposed areas.
- ☞ Exposed areas should be vegetated as soon as possible.
- ☞ The stormwater channel is proposed to be grassed which will assist to prevent erosion.
- ☞ Grassing must be undertaken immediately after construction.
- ☞ Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel.
- ☞ Regular monitoring of the channel should be undertaken, specifically in the wet season and after large storm events.
- ☞ The channel should be repaired immediately if damaged.

#### Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving floral ecological environment are deemed likely. The following points highlight the key latent impacts that have been identified:

- ☞ Loss of floral habitat within the footprint area;
- ☞ Loss of natural habitat associated with the surrounding areas and CBA1 due to edge effects;
- ☞ Loss of floral species diversity with the footprint area; and
- ☞ Continued AIP proliferation within the disturbance footprint and spread of these into adjacent vegetation communities.

#### Cumulative Impacts

The greatest threat to the floral ecology within the surrounding area of the proposed project, apart from loss to mining expansion include the continued proliferation of AIP species, which may contribute towards loss of indigenous floral communities within the local area. It should be noted that despite current, isolated footprint, if additional developments occur in this ecosystem and/or CBA then impacts on surrounding natural and CBA would need to be carefully considered.

#### *3.m.ii Final Site Map*

Refer to Figure 4 for the final site map indicating the location of the proposed Project in relation with the North Mine Infrastructure.

#### *3.m.iii Summary of the Positive and Negative Impacts and Risks of the Proposed Activity and Identified Alternatives*

Please refer to Table 28 to Table 30 for the impact assessment.

Refer to Section 3.i.xiii for the summary of the potential impacts, and Section 3.g for the discussion regarding the alternatives.

### **3.n Proposed Impact Management Objectives and the Impact Management Outcomes for inclusion in the EMP**

Please refer to the PART B EMP (Table 34, Table 35 and Table 36) for the detailed assessment of impacts and recommended objectives. The key objectives to consider will include:

- ☞ The EMP must be utilised to:



- Provide sufficient information to strategically plan the activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation.

The proposed impact management objectives as referred to in the Table 34, Table 35 and Table 36 includes:

- ☞ To operate within the enviro-legal ambits of South Africa.
- ☞ To be aware of the latest environmental legal requirements.
- ☞ Limit the impact of the activities on the ecological setting of the area.
- ☞ Operate the water management circuit on site to increase mining efficiency and reduce the need for maintenance of these facilities.
- ☞ Limit the loss of soils as far as possible and ensure that the integrity remains during stockpiling for the purposes of successful rehabilitation.
- ☞ Remain within the designated area demarcated for activities.
- ☞ Remain within the NEM:AQA Dust Regulation guidelines for rural communities.
- ☞ Protect heritage resources for future generations.
- ☞ Follow the waste hierarchy approach.
- ☞ Protect the integrity of the clean and dirty water management system.
- ☞ Return the area to its intended final land use.

Through the implementation of the proposed mitigation measures, it is anticipated that the identified impacts can be managed and mitigated effectively, and the objectives set can be met. Through the implementation of the mitigation and management measures it is expected that:

- ☞ The pollution of soil and water resources can be effectively managed through containment.
- ☞ Impact on unknown heritage sites can be effectively managed to the implementation of a management protocol in the event that such facilities are encountered.
- ☞ Ecological impacts can be managed through the implementation of pollution prevention measures, minimising land clearing, restricting working hours (faunal disturbance) and rehabilitation.
- ☞ The required permits for protected tree and plant species removal should be obtained prior to clearance of vegetation where required.

### 3.o Aspects for Inclusion as Conditions of Authorisation

No additional aspects are recommended for inclusion into this Environmental Authorisation Conditions. The Licence Holder should however ensure that all GN704 Exemptions are in place for activities within 100m of a watercourse.

### 3.p Description of any Assumptions, Uncertainties and Gaps in Knowledge

The following assumptions, uncertainties and gaps are applicable to this project:

- ☞ The Basic Assessment Report is based on existing available environmental information and information presented by the specialists is considered as true and correct; and
- ☞ The project description is based on the information presented by the applicant and is considered as true and correct.

### 3.q Reasoned Opinion as to Whether the Proposed Activity should or should not be authorised

It is the opinion of the EAP that the activity should be authorised.

#### Aim of this project

The proposed project relating to the current Environmental Authorisation process involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining



infrastructure at North Shaft. The purpose of the stormwater trench at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine's operational areas. This is a condition in terms of the approved WUL Ref 24053346, dated 21 January 2008, which states that: *Storm water at the plant area shall be managed in accordance with Government Notice 704 and storm water leaving the premises shall in no ways be contaminated by any substance.*

#### Alternatives Considered:

No location alternatives were investigated for this project. The channel is being upgraded upgradient of existing infrastructure in accordance with design drawings. The only alternative is the no-go alternative. In this latter alternative, by not implementing the upgrade, the Licence Holder will not be able to give effect to managing activities in line with GN704 (clean and dirty water separation). Another consideration by not implementing this project, is potential safety hazards due to flooding of the infrastructure should the clean water not be routed around the activities.

#### Impacts:

The outcomes of the impact assessment have not identified any significant or residual risks in terms of the construction, operation and decommissioning of the project. The management measures proposed in this report should proactively allow for the management and avoidance of any potential impacts.

#### Recommended Conditions:

The following conditions should be included in the authorisation in addition to the general conditions included in the Environmental Authorisations:

- ☛ An independent ECO must be appointed to assess the construction activities at least once a month, to ensure that all components of the EMP are addressed.
- ☛ An ecologist should be appointed prior to construction activities to determine whether any sensitive or protected species are present on site.
- ☛ In the event that such species are present, the relevant removal and/or plant rescue and relocation permits to be applied for where required.
- ☛ No activities may be established within either 100m of a river or within the 1:100-year flood line or within 500m of a wetland, where not approved in terms of the NWA.
- ☛ The maximum volume of topsoil, where available, is to be removed from construction footprint areas.

### **3.r Period for which the Environmental authorisation is required**

The project is required for the Life of Mine (LOM), which may still continue in excess of 20 years.

### **3.s Undertaking**

An undertaking by the EAP and the client is provided for in Section 2 of the EMP (PART B).

### **3.t Financial Provision**

The following sections present the methodology for the determination of the financial provision.

#### *3.t.i Explain how the amount was derived*

Environmental Assurance (Pty) Ltd (ENVASS) conducted the Financial Provision Assessment for Dwarsrivier Mine with a report dated June 2022. The information, master rate and calculations as presented in that report was utilised in the development of the financial provision for this project.

#### **3.t.i.1 Method of Assessment**

According to the ENVASS Report, the following methodology was followed:

#### Technical Financial Governance:

- ☛ Assessment of current state of operation (i.e. LOM changes linked to Environmental Authorisations);



- ☞ Reconcile against completed remediation / concurrent rehabilitation where underway; and
- ☞ Assessment, identification and costing of closure and remediation activities that will need to be completed.

#### Financial Governance:

- ☞ Assessment of current state of operation (i.e. LOM changes linked to Environmental Authorisations);
- ☞ Reconcile against completed remediation / concurrent rehabilitation where underway; and
- ☞ Assessment, identification and costing of closure and remediation activities that will need to be completed.
- ☞ Assessment of closure and remediation activities that will need to be completed.

#### Technical Financial:

- ☞ Translation of remediation plans, designs, activities, etc to actual activities at operational level; and
- ☞ Assessment of closure commitments, which includes assessments of EMPR, WUL and EA closure commitments.

#### In terms of the master rates utilised:

- ☞ Confirming the use of historical unit rates, assessment of categories and assessment of application; and
- ☞ Determining and updating Consumer Price Index (CPI) applicable unit rates for the costing.

### 3.t.i.2 Preliminary Cost Estimation

The following table presents the closure cost rehabilitation components and cost.

Table 31: Closure Cost

Aspect Name	Assessment Rate			
	Quantity	Unit	Rate	Amount
Rip soil	1,10	ha	R 10 302,10	R 11 332,31
Replace soil and spread - 300mm	11 000	m <sup>2</sup>	R 28,28	R 311 080,00
General area	1,10	ha	R 38 660,1	R 42 526,11
<b>Grand Total (to be included in overall financial provision) (excluding VAT)</b>				<b>R 364 938,42</b>
<b>Grand Total (including VAT)</b>				<b>R 419 679,18</b>

### 3.t.i.3 Financial Provision

The rehabilitation and liability estimate for the proposed project related to this application only was determined as a clean closure estimate, with no allowance for off-sets or salvage value. The assessment was conducted in accordance with the DMR Guideline and current best practice.

An Amount of approximately R 364 938,42 (excluding VAT, Preliminaries and General (P&Gs) and Contingencies), will be required.

The financial provision required by the holder of the mining right must be provided for by one or more of the following methods in order to achieve the total quantum of rehabilitation and remediation of environmental impacts and damage as well as final closure:

- ☞ Approved dedicated trust fund;
- ☞ Financial guarantee from a South African registered bank or any other approved financial institution;
- ☞ Cash deposit to be deposited at the office of the Regional Manager; or
- ☞ Any other manner determined by the Minister.

The mine is required to annually assess the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure), as well as the end of life liability.

As per Government Legislature, the mine is required to ensure full financial cover for the current liability at any point in the life of the operation. Pecuniary provision must be made for the shortfall between the existing trust fund balance and the premature closure or current environmental rehabilitation liability if applicable.





### *3.t.ii Confirm that this amount can be provided for from Operating Expenditure*

The mine has a guarantee in place to cater for the financial provision of rehabilitation activities. This is assessed annually to ensure that suitable funds are available. The next assessment will be undertaken in 2024 and annually thereafter.

## **3.u Specific Information Required by the Competent Authority**

*3.u.i Compliance with the Provisions of Section 24(4) (a) and (b) read with Section 24(3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998) The EIA Report must include the:*

**3.u.i.1 Impact on the Socio-Economic Conditions of any Directly Affected Person**

The project is undertaken to allow for optimal mining operations. The project should not have any negative impact on the Socio-Economic Conditions of any party.

**3.u.i.2 Impact of any National Estate referred to in Section 3(2) of the National Heritage Resources Act.**

Based on the available information, no impact on the natural estate will take place as part of this project.

## **3.v Other Matters Required in terms of Section 24(4) (a) and (b) of the Act**

None.



## PART B

# ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

## 1 ENVIRONMENTAL MANAGEMENT PROGRAMME/PLAN REPORT

### 1.a Details of the EAP

The following table presents the details of the EAP.

Table 32: Details of EAP

<b>Name</b>	Tanja Bekker
<b>Designation</b>	Environmental Assessment Practitioner
<b>Postal Address</b>	PO Box 22014, Helderkruijn, 1733
<b>Physical Address</b>	64 Blouberg Street, Noordheuwel, 1739
<b>Telephone Number</b>	+27 (0) 82 412 1799
<b>Cell Phone Number</b>	+27 (0) 82 412 1799
<b>Fax Number:</b>	+ 27 (0) 86 551 5233
<b>Email Address</b>	tanja@envirologistics.co.za

#### 1.a.i Expertise of the EAP

The following table presents the expertise of the EAP.

Table 33: Experience of the EAP

Name	Position	Qualification	Professional Registrations	Experience
Tanja Bekker	Environmental Assessment Practitioner	M.Sc. Environmental Management (RAU; now University of Johannesburg)	Registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA): Reg No. 306/2019 Professional Natural Scientist (Pr.Sci.Nat) with the South African Council for National Scientific Professions (SACNASP): Reg No. 400198/09 Member of the International Association of Impact Assessors (IAIA) Member of the Environmental Law Association of South Africa (ELA)	21 Years

Please refer to Annexure 2 for the EAPs Curriculum Vitae.

#### Education

- M.Sc. Environmental Management – RAU (University of Johannesburg)
- B.Sc. Earth Sciences (Geography & Geology) – RAU (University of Johannesburg)
- B.Sc. (Hons.) Geography – RAU (University of Johannesburg)

#### Career Enhancing Courses

- ISO 14000 Lead Auditors Course (WTH Management)
- Certificate in Project Management (University of Pretoria)
- Management Advance Programme (MAP 81) (Wits Business School)

#### Professional Affiliations

- Registered member of EAPASA
- Certified ISO 14001 Environmental Management System Auditor
- Registered Professional Natural Scientist with SACNASP
- Member of the South African affiliate of the IAIA
- Member of the ELA of South Africa

#### Summary of the EAP's past experience



**Ms. Bekker** is registered as a Professional Natural Scientist with SACNASP and is also a registered Environmental Assessment Practitioner (EAP) with EAPASA, a legal requirement stipulated by the National Environmental Management Act, 1998. She is further certified as an ISO 14001 Lead Auditor. Her qualifications include a BSc. Earth Sciences (Geology and Geography), BSc. (Hons.) Geography, and a MSc. Environmental Management. In addition to these tertiary qualifications, she obtained a Certificate in Project Management, and completed the Management Advance Programme at Wits Business School.

With more than 21 years' working experience in environmental management and the consulting industry and managing various Large Account Clients, she understands the South African Regulatory System, and can advise client with due diligence on their environmental regulatory requirements and offer a solution driven service to their project life cycle. She is equipped with exceptional project management and coordination skills, which especially enhances the service she offers clients within the environmental permitting system.

Her key focus is environmental management and compliance with extensive experience in the mining industry. Project Management and Coordination of projects form a critical component of her duties, which include project planning, initiation of projects, client, authority and stakeholder consultation, specialist coordination, budget control, process control, quality control and timeframe management. Her interest lies in a client advisory capacity, being involved during due diligence investigations, pre-project development and assisting the client and engineering team in adding value to develop the project in an environmentally sustainable manner, considering client costs and liabilities, as well as considering the implication of environmental authorisation conditions and requirements on project deliverables. Her involvement in projects has spanned over the project life cycle from Due Diligence Investigations, Pre-Feasibility Investigations, Prospecting Right Applications, Mining Right Applications, Environmental Reporting and implementation and auditing of Environmental Management Plans and Authorisations.

## **1.b Description of the Aspects of the Activity**

During 2018 an Environmental Authorisation Process was commissioned for the upgrade of the North Shaft Infrastructure. An Environmental Authorisation was issued to the mine by the DMRE to the Mine during May 2019.

In order to protect the North Shaft infrastructure a berm was constructed during the time when opencast mining operations were still undertaken (1990s). With the expansion activities associated with the North Shaft infrastructure it is required that this channel be rerouted and upgraded.



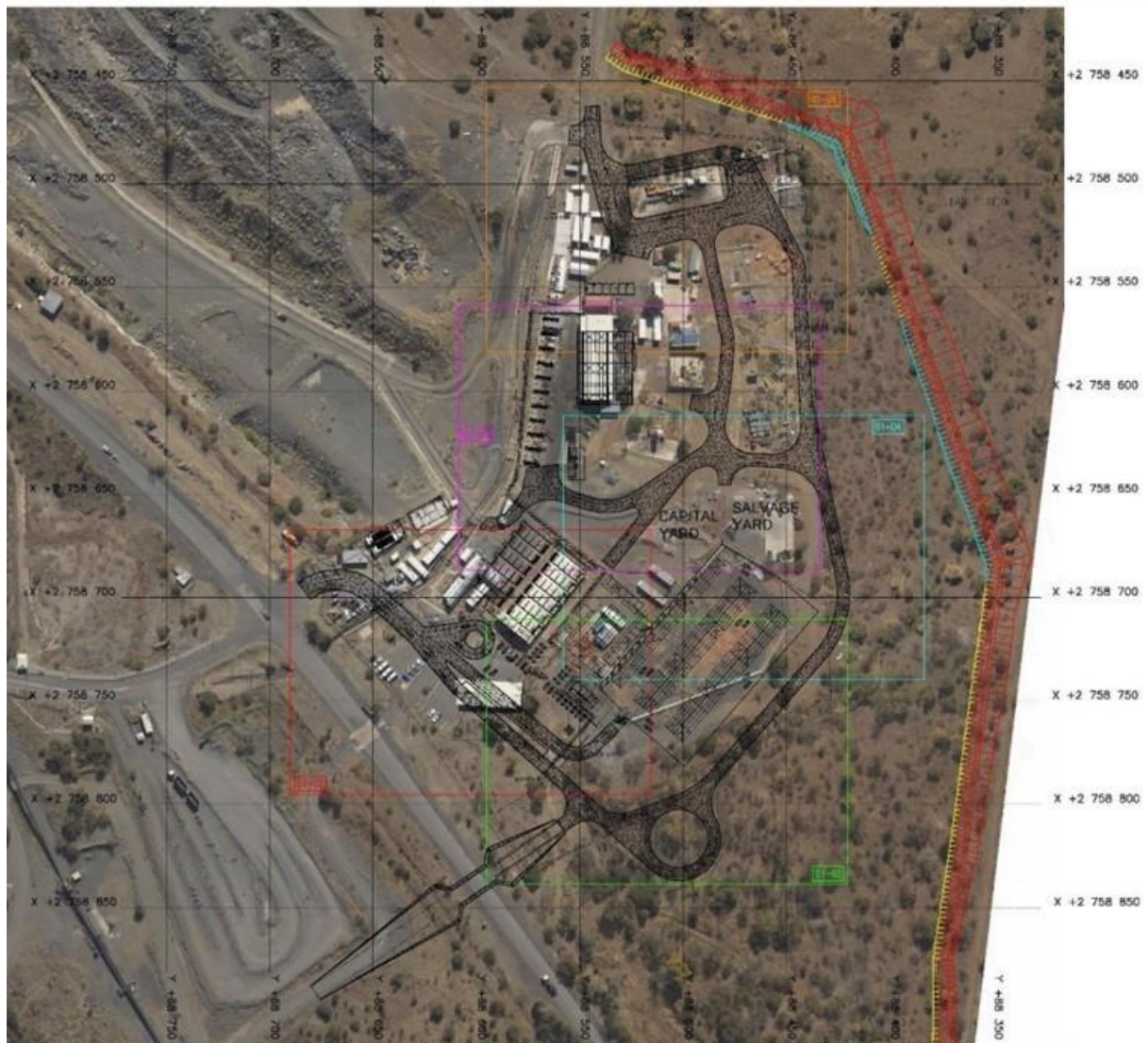


Figure 31: Location of proposed Project in relation with the North Shaft Infrastructure

The proposed project presented in this Basic Assessment Report (BAR) involves the upgrade of the stormwater channel at the Dwarsrivier Chrome Mine North Shaft to accommodate the expanded mining infrastructure at North Shaft. The channel will be an earth channel, following a portion of the existing channel. The channel will also be established with a berm upgradient to ensure that dirty water cannot enter this system. The purpose of the proposed stormwater channel at the North Shaft operational area is to facilitate the separation/ diversion of clean stormwater away from the mine's operational areas.





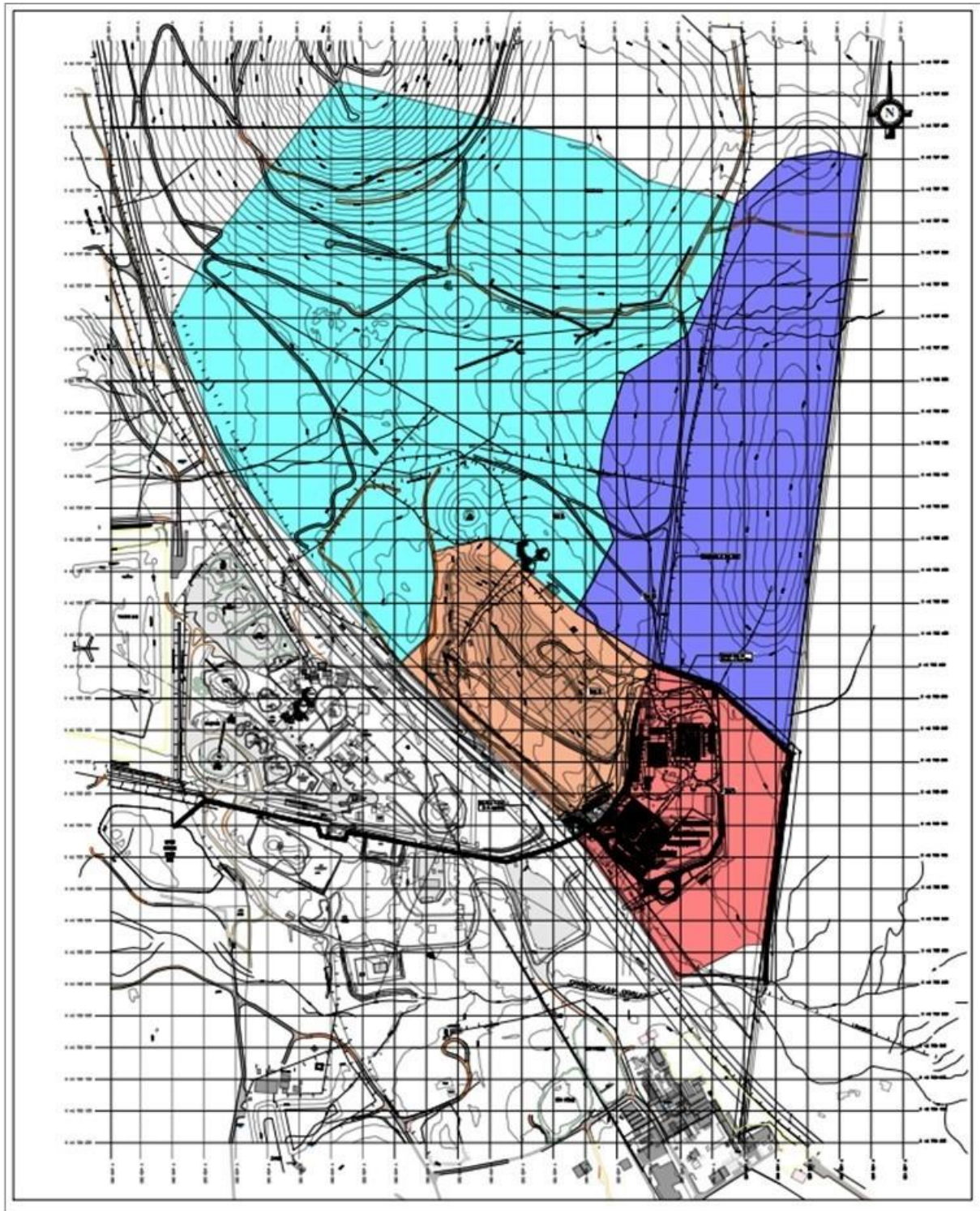


Figure 32: Various Clean and Dirty Water Areas around the North Mine Infrastructure

The channel will be an earth channel. The separation and management of clean and dirty stormwater is an operational requirement for all mining operations within South Africa. The diverted clean stormwater will be discharged south of North Shaft. The channel will be approximately 0.6 kilometres (km) (610 metres [m]) in length and will be surrounded by an earth berm which varies in width (i.e. 10m to 30m) across its length. The overall area that the channel will encompass will be approximately 1ha.

The channel has been sized to convey a flow rate of 9 m<sup>3</sup>/s, which will be discharged into the Springkaanspruit.





## 1.c Composite Map

Please refer to the following figure. For further information regarding the environmental characteristics of the area, please refer to Section A (Section 3.i.x.1).



Figure 33: Composite Map



## 1.d Description of Impact Management Objectives including Management Statements

### 1.d.i Determination of Closure Objectives

The rehabilitation plan is developed on the basis that the rehabilitated areas are safe, stable, and non-polluting and are able to support a self-sustaining ecosystem similar to that of the surrounding natural environment. To ensure that the rehabilitation plan is aligned with the closure objectives, a high-level risk assessment of the project components has been undertaken to establish the potential risks associated therewith.

Please refer to Table 34 to Table 36 for the detailed assessment of impacts and recommended objectives. The key objectives to consider will include:

- ☞ To operate within the enviro-legal ambits of South Africa.
- ☞ To be aware of the latest environmental legal requirements.
- ☞ Limit the impact of the activities on the ecological setting of the area.
- ☞ Operate the water management circuit on site to increase mining efficiency and reduce the need for maintenance of these facilities.
- ☞ Limit the loss of soils as far as possible and ensure that the integrity remains during stockpiling for the purposes of successful rehabilitation.
- ☞ Remain within the designated area demarcated for activities.
- ☞ Remain within the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM:AQA) Dust Regulation guidelines for rural communities.
- ☞ Protect heritage resources for future generations.
- ☞ Follow the waste hierarchy approach.
- ☞ Protect the integrity of the clean and dirty water system.
- ☞ Return the area to its intended final land use.

### 1.d.ii Volumes and Rate of Water Use Required for the Operation

No additional water is required for the proposed activities.

### 1.d.iii Has a Water Use Licence been applied for?

A Water Use Licence Application (WULA) has been uploaded onto the Electronic Water Use Licence Application and Authorisation System (EWULAAS) system during March 2023. The WUL has made provision for the location of mining infrastructure within the regulatory GN509 zones. In terms of this channel, no activities will be undertaken within the 1:100 year floodline.

### 1.d.iv Impacts to be mitigated in their Respective Phases

The following tables (Table 34 to Table 36) present the:

- ☞ Phases of the proposed project;
- ☞ Mitigation requirements;
- ☞ Compliance standards; and
- ☞ Time period during which the management measures should be implemented.



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Table 34: Planning Phase Impact Table with Management Measure, Objectives and Standards

Name of Activity	Impact Area	Potential Impacts	Rating	Mitigation Type	Significance	Performance Objectives	Goals	Time Period for Implementation				Action Plan								
Activities		Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r		Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency					
<b>Planning Phase</b>																				
<b>Legal Requirements (Environmental Authorisations)</b>	Legal Compliance	Unlawful water and waste management activities, which could lead to NWA Directives; NEM:WA Norms and Standard contravention and NEMA Section 24G Rectification fines.	-14	A legal assessment of all activities and future planned activities must be undertaken annually to ensure that all activities are authorised.	17	CbA	To operate within the enviro-legal ambits of South Africa.					x	Compliance in terms of Regulatory Requirements and the implementation of the EMP.	Appointment of an Independent Environmental Control Officer (ECO) to assess compliance with the EMP.	Independent ECO	Monthly for the construction phase. Thereafter annual external audits can be undertaken.  Monthly update of legal register.				
				All legally appointed personnel responsible or involved in water use activities and activities associated in the Environmental Authorisations on site must receive training on the requirements of the Environmental Authorisations and relevant Environmental Legislation.							x	Compliance in terms of Regulatory Requirements and the implementation of the EMP.	Monthly environmental meetings must be implemented to discuss the mining plan, implementation thereof, implication on current Environmental Regulations and potential constraints and liabilities. Minutes must be kept of these meetings and action plans with responsibilities must be drafted.	Safety, Health, Environment and Quality (SHEQ) Department to Coordinate	Monthly Environmental Meetings.  Monthly update of legal register.  Regular updates of Code of Practices (COPs) and Strategic Operating Plans (SOPs).  Annual induction which includes the relevant contents of Environmental Authorisations, approved Environmental Reports and applicable Environmental Legislation.					
				Quarterly internal audits must be undertaken during the construction phase, where after biannual audits can be undertaken, on the lawful implementation of the Environmental Authorisation.																
				A copy of the Water Use Licence (WUL) must be available on site at all times.																
				The following buffers should be maintained: The site is not planned to be within 1:100-year floodline.			Protection of sensitive environments.	Protection of sensitive environments.								Site layout map indicating no go zones – immediately.				



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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				For this reason, no activities may be undertaken within 1:100-year floodline unless authorised.										trained to understand the contents of these documents and to adhere thereto. Environmental Awareness training must be provided to employees.  A site layout map with all the no-go zones indicated should be compiled.		
				The legal register must be updated to indicate all activities associated with Environmental Authorisations. It is recommended that an ECO be appointed to assess the site during the construction phase			Proactive knowledge of potential system errors and/or constraints will avoid potential non-compliances or process delays.	Operational Environmental Management System that addresses the needs and responsibilities of all departments.				x				
Scheduling of Activity	Proactive Management on Surface Water Resources and Ecosystems	The construction of the trench during the wet season could lead to an increase in erosion and siltation of the downgradient Springkaanspruit	-12	<p>The planning schedule for this project must take into consideration the rainfall patterns of this area. Construction of this project should be scheduled in the dry season and be completed before the wet season commence.</p> <p>Prior to the commencement of construction activities, the existing AIP Management/Control Plan should be updated and implemented:</p> <ul style="list-style-type: none"> <li>The AIP Management/Control Plan should be implemented by a</li> </ul>	2	CbA	Protection of sensitive environments.	Avoidance of siltation of downgradient water resources	x						SHEQ Department	Signoff of Implementation Schedule by Environmental Department

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				suitably trained individual. No chemical control of AIPs to occur without a certified professional; Removal of alien invasive species should preferably commence during the Pre-construction & Planning phase (as per the current AIP Control Plan) and continue throughout all phases of the proposed trench development; and  Prior to the commencement of construction activities on site, the existing rehabilitation plan should be updated for implementation												

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency	
				throughout the subsequent phases (i.e., to accommodate concurrent rehabilitation).													
		Potential failure to identify and relocate floral SCC (other than NFA protected species which have already been identified within the vicinity) to suitable habitat outside the development footprint. Note: previous field assessments indicated that no NFA protected marulas ( <i>Sclerocarya birrea subsp. caffra</i> ) are located within the footprint area or within 10 m of the proposed trench.	-14	<p>A walkdown of the footprint area should take place prior to vegetation clearing and should be conducted by a suitably qualified specialist.</p> <p>Permits from the Limpopo Economic Development, Environmental and Tourism (LEDET) and/or authorisation from the Department of Forestry, Fisheries, and the Environment (DFFE) should be obtained to remove, cut, or destroy any provincially or nationally species (respectively) before any vegetation clearing may take place.</p> <p>It is recommended that prior to the commencement of construction activities the entire construction servitude be clearly demarcated to limit footprint creep and edge effects – especially where creep into surrounding Sensitive Ecosystems habitat can result in impacts on floral communities.</p>	2	CbA		Protection of Sensitive Ecosystems and adjacent natural habitat	x								

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Name of Activity		Potential Impacts	Rating	Mitigation Type	Significance		Performance Objectives		Goals		Time Period for Implementation			Action Plan				
Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r					Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				<p>The relocation of floral SCC must take place prior to the commencement of the Construction and Operational Phase where vegetation clearing will occur. Good record-keeping will be necessary to record this process and to document all successes and failures associated with the relocation.</p> <p>It is recommended that for species that cannot be relocated (especially RDL species if encountered), seedlings and /or seeds of these species are harvested from the development footprint area before clearing activities commence and grown under nursery conditions with the purpose to use these species for rehabilitation at a later stage.</p> <p>Design of infrastructure and layouts should be environmentally sound. The designs must adhere to all legislation requirements and all possible precautions taken to prevent potential spills and /or leaks, as well as unnecessary</p>														



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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r					Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				clearance of vegetation. At all times, ensure that sound environmental management is in place during the Pre-construction & Planning Phase. A walkdown of the footprint area should take place prior to vegetation clearing and should be conducted by a suitably qualified specialist.														

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Table 35: Construction and Operational Phase Impact Table with Management Measure, Objectives and Standards

Name of Activity		Potential Impacts	Rating	Mitigation Type	Significance		Time Period for Implementation				Action Plan					
Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
<b>Construction and Operational Phase</b>																
Land and Footprint Clearance	Geology	No direct impact - Activities will not be constructed over future planned mining areas.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Topsoil Stripping and Stockpiling and Vegetation Removal	Topography	Direct impact: Alteration of topography. Removal of vegetation and the associated shaping of the area will lead to change in topographical characteristics of the area. The impact is not considered significant due to the fairly flat nature of the topography and the location of the activities in the immediate vicinity of the existing plant area.	-9	The footprint areas of all surface infrastructure must remain as small as possible within the parameters of operational and engineering requirements. Construction areas must be clearly demarcated to control movement of personnel and vehicles, providing clear boundaries for construction sites in order to limit the spread of impacts. Markers and pegs will be erected and maintained along the boundaries of the working areas before commencing any work. If proved insufficient for control, these shall be replaced by fencing. Designs of the facilities must be undertaken by a registered Engineer. Draw up a procedure clearly reflecting the method and phases of clearance of vegetation only in areas where	-5	R	Remain within demarcated areas. Design facilities to blend into the existing site character as far as practically possible.	No disturbed areas should remain beyond the demarcated areas. 100% compliance to remain with approved footprint areas.	x				Soil erosion and incorrect stockpiling of topsoil.	Appointment of an Independent ECO to assess compliance with the EMP. The SHEQ Department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements.	Independent ECO and SHEQ Department	ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken. SHEQ: Weekly monitoring

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Name of Activity		Potential Impacts	Rating	Mitigation Type	Significance		Time Period for Implementation				Action Plan					
Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				<p>construction will take place.</p> <p>Removal of vegetation must be undertaken in a phased approach to limit surface exposure and only once an ecologist has assessed the area. Should protected species be present, the necessary removal permits must be obtained.</p> <p>Temporary erosion control measures may be used to protect the disturbed soils during the construction phase until adequate vegetation has established.</p> <p>Clean and dirty water separation must be implemented early in the construction phase, especially down-gradient of construction areas to ensure that the natural runoff patterns are impacted as little as possible.</p> <p>Linear infrastructure must follow, for as far as practically possible, the natural contours of the area.</p> <p>Clear signage must be in place indicating the presence of the trench as well as indicate an prohibitions (such as littering) and risks.</p>												

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
	Soil, Land Use and Land Capability	Direct impact: The removal and stockpiling of topsoil may lead to a loss of soil resource and land capability through erosion of the stockpiles and chemical and physical degradation.	-10	Adhere to Soil Stripping, Soil Stockpiling and Soil Management Plan as part of the original EMP (Soil Utilisation Guideline).  Topsoil should be stockpiled on designated topsoil stockpiles, unless around linear infrastructure, where the topsoil could be stockpiled next to the linear structure.	-5	R	Limit the loss of soils as far as possible and ensure that the integrity remains during stockpiling for the purposes of successful rehabilitation.  Protect the soil resources within the area in which the mine operates.	The integrity of the soils stockpiled must remain suitable for the purposes of rehabilitation.  No disturbed areas should remain beyond the demarcated areas.  100% compliance to remain with approved footprint areas.	x				No soil erosion and correct stockpiling of topsoil.	Appointment of an Independent ECO to assess compliance with the EMP.  The SHEQ Department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements.  Erosion protection measures should be implemented and monitored on areas identified.  Photographic records of assessments must be kept.  Induction should be reviewed and updated every 18 months.	Independent ECO and SHEQ Department	ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken.  SHEQ: Weekly monitoring.  Induction updates: every 18 months



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		Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r			Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency		
				Topsoil must also be used to serve as a berm on the outer side of the channel.														
				Stockpiles and berms should be revegetated to establish a vegetation cover as an erosion control measure. These stockpiles should also be kept free of alien at all times to prevent loss of soil quality														
				Existing contaminated soils should be removed prior to construction activities by a licensed waste removal company and to a licensed facility.														
		Direct impact: Soil compaction	-9	The contractor will ensure that all activities, material	-5	R												

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				<p>and equipment storage and personnel movement take place within the designated area.</p> <p>A site layout plan must be developed, indicating the following:</p> <ul style="list-style-type: none"> <li>☛ Location of all approved activities;</li> <li>☛ 1:100 year buffer around all watercourses.</li> <li>☛ Location of the CBA and Sensitive Areas and mark these areas where construction is not approved as no-go zones.</li> <li>☛ All vegetation management zones as per the Biodiversity Action Plan.</li> </ul> <p>Laydown areas should be located within the exiting North Mine Infrastructure area.</p> <p>All contractors must receive induction. The induction should be updated on site, to make provision for the site layout plan and a detailed explanation on the purpose of the no-go zones, presence of protected species, presence of the CBAs and ESAs and the</p>												

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				meeting the requirements of these areas.													
				A fine system/ disciplinary system must be implemented on site for all significant or recurring environmental non-compliances.													
				Site clearance and activities should be restricted to the approved footprint.													
				Construct clean and dirty water separation as part of the site design.													
		Direct impact: Clearing vegetation will result in the exposure of soil, which may in turn lead to soil erosion.	-10	The stormwater channel is proposed to be grassed which will assist to prevent erosion. Grassing must be undertaken immediately after construction. Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel.	-5	R	Limit the loss of soils as far as possible and ensure that the integrity remains during stockpiling for the purposes of successful rehabilitation.	The integrity of the soils stockpiled must remain suitable for the purposes of rehabilitation.	x				x	No soil erosion.	Appointment of an Independent ECO to assess compliance with the EMP. The SHEQ Department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements. Erosion protection measures should be implemented and monitored on areas identified. Photographic records of assessments must be kept.	Independent ECO and SHEQ Department.	ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken.  SHEQ: Weekly monitoring.
				Regular monitoring of the channel should be undertaken, specifically in the wet season and after large storm events. The channel should be repaired immediately if damaged.			Protect the soil resources within the area where the proposed project is located.										
				Natural vegetation establishment (self-succession) will be encouraged on cleared areas and topsoil stockpiles.													

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				<p>No construction or project related activities may be undertaken outside of the demarcated areas.</p> <p>Energy dissipator systems must be implemented to reduce water runoff from this area. This will include water breaks, and vegetating the channel.</p> <p>A fine system/ disciplinary system must be implemented on site for all significant or recurring environmental non-compliances.</p> <p>Site clearance and activities should be restricted to the approved footprint. Contractors' areas should be established on already disturbed footprints.</p> <p>Regular inspections should be undertaken along the channel as well as at the discharge point to monitor erosion and AIP. Inspections sheets and photo-log must be kept.</p> <p>Where erosion or the presence of AIPs are recorded, this must be rehabilitated as soon as practically possible.</p>												



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							Retaining soil integrity for rehabilitation.	Maintaining soil integrity, with successful vegetation establishment.	x				x	No soil erosion and correct stockpiling of topsoil.	Independent ECO and SHEQ Department	ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken.  SHEQ: Weekly monitoring
	Terrestrial Ecology (Fauna & Flora)	Specific Impacts Identified include: Site clearing and the removal of vegetation considered to be representative of the Sensitive Ecosystems and CBA habitat. Potential failure to monitor the success of relocated floral SCC (where applicable)	-11	Adhere to the measures presented under soil impacts. Adhere to the measures presented under hydrological impacts (especially by implementing storm water management measures). Adhere to the management measures presented for air quality management. Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint – manage footprint creep to surrounding areas, especially as these	-5	CbA	Limit the impact of the mining operation on the Ecological Setting of the area.	No unlawful removal of flora of conservation importance should take place.  Initiate rehabilitation of disturbed areas once the construction phase has been completed.  Successful self-succession to be achieved.  Eradication of invasive species within the mining area footprint.	x				x	Limit the impact of the construction on the ecological setting of the area.	Independent ECO and SHEQ Department	ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken.  SHEQ: Weekly monitoring  Site layout plan/ map development: Immediately.  Training; Annually

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				<p>areas provide Sensitive Ecosystems habitat.</p> <p>Where possible vegetation clearance and commencement of construction activities should either be scheduled to coincide with low rainfall conditions when erosive stormwater is anticipated to be limited or alternatively stormwater controls must be established at the start of construction and dust suppression implemented.</p> <p>The footprint must be kept as small as possible to minimise impact on the surrounding environment (edge effect management). The approved footprint area must be demarcated to avoid unnecessary clearing and destructing of natural vegetation.</p> <p>During the surveying and site-pegging phase of the project, an ecologist must identify whether any sensitive species are present and all floral SCC if present that will be affected must</p>												ecological assessment, wetland assessment and hydrological assessment).	Environmental Awareness training must be provided to employees.	

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				<p>be marked and where possible, relocated to suitable habitat surrounding the disturbance footprint. The relevant tree and plant removal permits must be applied for with DAFF and/ or LEDET if required, prior to the construction phase.</p> <p>Clearing of vegetation should take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential. Should any floral species protected under the Limpopo Environmental Management Act (Act 7 of 2003) (LEMA) and National Forest Act (Act 84 of 1998) (NFA) be encountered within the proposed development footprint areas, permits should be obtained from LEDET and/ or DAFF to remove, cut or destroy any protected tree or plant species before construction of infrastructure takes place</p> <p>Prior to the removal of plant species, the mine should appoint an ecologist to monitor and oversee the removal of all identified protected species, which should</p>													

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				be removed under tree/ plant removal permits. All such species should be demarcated by signage or tape. If possible, vegetation clearance and commencement of construction activities can be scheduled to coincide with low rainfall conditions when the erosive stormwater and wind are anticipated to be low. Natural vegetation establishment (self-succession) will be encouraged on cleared areas and topsoil stockpiles. No collection of firewood, floral SCC or medicinal floral species must be allowed by construction or mining personnel. A fine system/disciplinary system must be implemented on site for all significant or recurring environmental non-compliances. All employees, or contractors on site, involved in this project should receive a detailed induction on the expectations for the protection of fauna and flora on site.												



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				Alien and invasive plant species eradication should be implemented on site.												
		Direct impact: Displacement of faunal species and human/animal conflict. Due to the fact that the site is located within an existing operational mining footprint, and directly, the impact is not regarded to be as significant as it would have been for a greenfields site.	-6	<p>A record of any animal fatalities should be kept on site. The reason for the fatality and action to avoid such in the future (if possible) should be stated.</p> <p>Construction and site clearance should be undertaken in a systematic approach to allow animals to relocate from the site where construction will take place.</p> <p>All employees, or contractors on site, involved in this project should receive a detailed induction on the expectations for the protection of fauna and flora on site.</p> <p>Clearance of vegetation must be undertaken in such a manner as to provide sufficient time for animals to relocate.</p>	-5	R	Limit the impact of the mining operation on the Ecological Setting of the area.	<p>Zero animal fatality rates should be achieved.</p> <p>No unlawful removal of floral species of conservation importance, including protected and medicinal species should take place.</p>	x			x	Limit the impact of the construction on the ecological setting of the area.	<p>Appointment of an Independent ECO to assess compliance with the EMP. The SHEQ department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements.</p> <p>Records of Incidents should be kept on site and all employees should be made aware of the use thereof.</p>	Independent ECO and SHEQ Department	<p>ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken. SHEQ: Weekly monitoring.</p> <p>Training; Annually</p> <p>Monthly reporting on animal fatalities.</p>
		Proliferation of AIP species that colonise in areas of increased disturbances and that outcompete native species, including the further transformation of adjacent natural habitat.	-12	<p>Alien and invasive plant species eradication should be implemented on site.</p> <p>Areas of construction must be clearly demarcated.</p> <p>No construction or project related activities may be undertaken outside of the demarcated areas.</p>	-5	R	Limit the impact of the mining operation on the Ecological Setting of the area.	<p>No unlawful removal of flora of conservation importance should take place.</p> <p>Initiate rehabilitation of disturbed areas once the construction phase has been</p>	x		x	Limit the impact of the construction on the ecological setting of the area.	<p>Appointment of an Independent ECO to assess compliance with the EMP.</p> <p>The SHEQ Department should undertake ongoing site monitoring to determine whether activities</p>	Independent ECO and SHEQ Department	<p>ECO: Monthly for the construction phase. Thereafter annual external audits can be undertaken.</p> <p>SHEQ: Weekly monitoring</p> <p>Site layout plan/</p>	

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		Additional pressure on floral habitat by increased human movement associated with the proposed construction activities, including increased vehicular movement, contributing to: <ul style="list-style-type: none"> <li>Increased introduction and spread of AIPs; and</li> <li>Increased risk of fire frequency.</li> </ul> The above could lead to a loss of sensitive floral habitat and the potential loss of floral SCC.	-12	It is recommended that all construction personnel be educated in environmental awareness. Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. It is recommended that existing roads be utilised and the construction of new roads minimised. Any unauthorised collection of floral material must be prohibited. Harvesting of protected floral species by construction personnel should be strictly prohibited. No illicit fires must be allowed during the construction of the proposed development.	-5	CbA		completed. Successful self-succession to be achieved. Eradication of invasive species within the mining area footprint.						on site are undertaken in accordance with the EMP Requirements. Develop a site layout plan indicating all no-go zones (in terms of the aquatic assessment, ecological assessment, wetland assessment and hydrological assessment). Environmental Awareness training must be provided to employees. Monitoring of any rescued and relocated floral species of conservation importance must commence during the Construction phase.		map development: Immediately. Training; Annually
		Dumping of overburden outside of designated areas, promoting the establishment of AIPs, could lead to the loss of floral habitat, diversity, and SCC through displacement by AIPs.	-12	No dumping of litter, rubble or cleared vegetation on site should be allowed. Rubble removed because of the excavation activities can be disposed of at one of the mines waste rock dumps – no excavated material to be dumped in the development footprint. No temporary dump sites	-5	CbA										

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				should be allowed in areas with natural vegetation. Waste disposal containers and bins should be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be mulched and composted at the mine's nursery.												
		Potentially poorly managed edge effects:		Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area.												
		<ul style="list-style-type: none"> <li>Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to the continual proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat; and</li> <li>Compaction of soils outside of the development</li> </ul>	-12	<ul style="list-style-type: none"> <li>To limit edge effect impacts to the surrounding natural habitat, the below must be considered:                             <ul style="list-style-type: none"> <li>No construction rubble to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility;</li> </ul> </li> </ul>	-5											

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		<p>footprint due to indiscriminate driving of construction vehicles through natural vegetation.</p> <p>The above could lead to a loss of floral habitat, diversity, and SCC within the direct footprint of the proposed development. Loss of surrounding floral diversity and floral SCC through the displacement of indigenous flora by AIP species - especially in response to disturbance in natural areas.</p>		<ul style="list-style-type: none"> <li>All soils compacted as a result of construction activities should be ripped, profiled and reseeded;</li> <li>Minimise the risk of erosion by limiting the extent of disturbed vegetation and exposed soil. Where construction activities have impacted habitat surrounding the berm, these areas should be levelled and revegetated with a mix of indigenous grass species. It should be ensured that the berms are structurally sound; and</li> <li>Manage the spread of AIP species which may affect remaining natural habitat within surrounding areas.</li> </ul>													
		Direct impact: The disturbance of the cleared areas may allow the establishment of alien and invasive vegetation.	-12	<ul style="list-style-type: none"> <li>Alien and invasive plant species eradication should be implemented on site.</li> <li>Areas of construction must be clearly demarcated.</li> <li>No construction or project related</li> </ul>	-5	R	<p>Awareness creation on the importance of that natural ecosystem in which the mine operates.</p> <p>Rehabilitation</p>	<p>Eradication of AIP species within the mining area footprint.</p> <p>Successful self-succession to be achieved.</p>	x				x	No proliferation and spread of AIPs.	An alien and invasive plant species eradication plan must be implemented on site in line with the current monitoring	SHEQ Department	AIP species monitoring (monthly); AIP species eradication (annually or as required); Ecological Study (Biodiversity)



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		Increased prevalence of exotic invasive species: the fact that the area will be cleared for construction creates niches that can be colonised by exotic and/or invasive species. This is compounded by the fact that trucks and other heavy machinery often act as vectors for seeds of these species.		activities may be undertaken outside of the demarcated areas.			of disturbed areas with indigenous vegetation.  Smallest possible area of disturbance philosophy.	100% compliance to remain with approved footprint areas.  Initiate rehabilitation of disturbed areas within one year of final activity.						programme. This must be undertaken prior to the growing season.		Action Plan) Audits (annually)
		Direct and Cumulative Impact: Habitat degradation due to dust: Increased dust will occur in all areas where vegetation is cleared. Dust will be caused by excavation, and construction. Dust in the area will be greatly increased due to the dry weather conditions and the nature of the soil in the area. Dust settling on plant material can reduce the amount of light reaching the chlorophyll in the leaves, thereby reducing	-7	Maintain the current air quality monitoring stations that determine fallout and implemented respirable dust (PM10) monitoring that could arise from the activities.  Implement dust suppression in and around the construction area where required.	-5	CbA	Recording of dust fall out to determine trends.	Meeting ambient dust fall out limits in terms of applicable NEM:AQA Regulations.	x			x	National Dust Regulation Compliance.	Dust dispersion will be monitored in line with the current dust monitoring programme.	SHEQ Department	Monthly Monitoring with Annual Reporting.

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		photosynthesis, which in turn reduces plant productivity, growth and recruitment.															
	Riparian Habitat & Wetlands	Impact on the movement of construction vehicles on the riparian habitat associated with the Springkaanspruit .	-10	<p>Ensure that surface infrastructure footprint does not encroach on freshwater resource habitats and that vegetation clearing is limited to essential areas only.</p> <p>Energy dissipation measures must be implemented along the channels and also at the discharge point, upgradient of the 1:100 year floodline to reduce water velocity.</p> <p>Ongoing Aquatic Biodiversity Monitoring should be undertaken at the upstream and downstream points at perennial water systems.</p> <p>Ongoing surface water monitoring should be undertaken at the upstream and downstream monitoring points.</p> <p>Implement and maintain an alien vegetation management programme.</p>	-5	CbA	Remain within or approve upon the current Aquatic Health and Water Quality baseline conditions of the Springkaanspruit.	Improve upon the current aquatic health and water quality baseline conditions.	x				x	Compliance in terms of the current WUL.	Ongoing aquatic biomonitoring and water quality assessments.	Aquatic Specialist	Surface water monitoring and Biomonitoring in line with the current monitoring programme.
	Hydrology	Direct impact: The removal of vegetation can lead to increased surface runoff,	-10	Rehabilitate open areas as soon as practically possible. Self-succession should be	-5	CbA	Operate the water management circuit on site to increase	Implement the clean and dirty water management	x	x			Compliance in terms of the WUL.	Annual compliance in terms of the designs of the facility and	SHEQ Department and Aquatic specialist	Surface Water Monitoring in line with the current	

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		which may in turn alter natural surface water flows and increase siltation of watercourses as well as pollution control facilities.		encouraged. If natural succession of vegetation is not established within one rainy season, after rehabilitation, the disturbed areas and areas adjacent to the infrastructural areas must be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, and to minimise soil erosion and dust emission. The stormwater channel is proposed to be grassed which will assist to prevent erosion. Grassing must be undertaken immediately after construction. Energy dissipation measures such as rock riprap should be employed along steep sections and at the exit of the channel. Regular monitoring of the channel should be undertaken, specifically in the wet season and after large storm events. The channel should be repaired immediately if damaged. Limit the areas to be cleared to the demarcated sites.			mining efficiency and reduce the need for maintenance of these facilities.	measures on site.						compliance in terms of the WUL must be undertaken.  The water quality (constituents listed in the WUL) for the mine must be monitored monthly and records must be kept of these results in a centralised system.  Analysis of results must be undertaken by an accredited laboratory.		monitoring programme.	
	Geohydrology	No direct impact during the construction phase.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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	Heritage	No direct impact during the construction phase.	-9	<p>The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.</p> <p>This procedure applies to the mine' permanent employees, its subsidiaries, contractors and subcontractors , and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction</p>	-1	CbA	Protect heritage resources for future generations.	Ensure that there is a 100% non-occurrence of impacts to heritage resources.	x				x	Presence of archaeological artefacts.	<p>Implementation of a chance find procedure during construction.</p> <p>Training of all contractors and responsible parties must be undertaken to ensure that all parties are aware of the need to protect these resources and what to observe for. Daily inspections must be undertaken during the site clearance and excavation (for foundations) phases.</p>	Environmental Department	Ongoing



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				<p>crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.</p> <p>☛ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors , or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.</p> <p>☛ It is the responsibility of the senior</p>													

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				on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. The senior on-site Manager will inform the Environmental Control Officer (ECO) of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.												
	Visual	Direct impact: soil stripping and footprint clearance	-4	Stripping of vegetation and soils should be undertaken within the demarcated areas.	-3	R	Retain the aesthetics of the area as far as practically possible.	Design and construction infrastructure to blend in with the general topography as far as practically possible. No encroachment of infrastructure outside of demarcated areas.	x			x	Retain activities in demarcated areas.	The Project Manager should implement the necessary design concepts to limit the impact on the soil resources and ecological connectivity and functioning of the ecosystem.	Project Manager	As part of the project design. Prior to construction.
	Air Quality	Direct impact: Dust-fallout	-9	Utilise the existing monitoring network to monitor dust fall out in and around the construction area. Strictly enforced speed limits on all roads. Maintain a complaints register should	-5	CbA	Recording of dust fall out to determine trends.	Meeting ambient dust fall out limits in terms of applicable NEM:AQA Regulations.				x	National Dust Regulation Compliance.	Dust dispersion will be monitored as part of the overall mine dust monitoring programme.	SHEQ Department	Dust monitoring to be done in line with the current monitoring programme.

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				stakeholders need to raise concerns.												
				Complaints raised must be acknowledged within 24 hours and addressed within an agreed timeframe.												
				All remaining open temporary areas should be rehabilitated once construction has been completed.												
				Bare soils can be regularly dampened with water to suppress dust during the construction phase, especially when strong wind conditions are predicted according to the local weather forecast.												
				Limit site clearance to designated areas.												
	Noise	The area is located within the mining area. Noise impacts are not considered to be significant but can occur during excavation and construction activities.	-5	Equipment will be well maintained to reduce excessive noise creation.	-4	CbA	Remain with the required health and safety standards.	Remain within the regulated guidelines and limits as required by the Mine Health and Safety Act, 1996 (Act No. 29 of 1996).	x					Monitor complaints received.	SHEQ Department	Maintain complaints register.
				Activities will be restricted to the daytime.												Regulator noise monitoring in terms of Mine Health and Safety Standards.
	Social	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Waste Management and Handling</b>	Geology	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Topography	No direct impact.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Soils	Contamination of soil resources due to hydrocarbon spills.	-11	Storage of fuels and oils, the refuelling of vehicles and equipment maintenance must be limited to designated, banded areas. Bunds	-5	CbA	Protecting of soil integrity.	Zero presence of contaminated land due to early detection and implementation of actions.	x				x	Soil pollution prevention	The SHEQ Department should undertake ongoing site monitoring to determine whether activities	SHEQ Department

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				to be 110% of volume of the materials stored. All fuels and soils must be stored in appropriate containers. Chemicals and hazardous material must be stored in suitable containers, fit for purpose and in line with MSDS requirements. Where drip trays are too small, specially prepared, non-pervious bunds with solution trenches must be used to capture spillages. Oils and potentially hazardous materials must be disposed of at a licensed facility and waste certificates obtained. A spill kit must be provided to be used in the event of a spill. A spill kit must be provided to be used in the event of a spill. If a spill occurs, the contaminated soil must be removed immediately. Contaminated soil must be stored according to best practices until it can be disposed of at a suitably licensed facility. Safety signage must be used at designated storage areas.										on site are undertaken in accordance with the EMP Requirements. This should be undertaken by means of a thorough site visit, record keeping of findings in a checklist format, issuing of non-conformances to responsible parties, listing thereof on the Isometrics system or similar reporting system and feedback to the management team.		
							Awareness creation on site regarding duty of care and waste management.							Induction with the view on creating environmental awareness.	SHEQ Department	Annually for permanent staff. Start of each visit for contractors.



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				All workers must undergo an induction which includes environmental awareness training to make them aware of the environmental incident management procedures as well as the importance of complying with management measures.													
		Contamination of soils as a result of a lack of sanitary services	-11	Chemical toilets must be readily available to employees where permanent infrastructure is not available.  Licensed companies must be appointed to remove any contaminated material and/ or wastes to licensed landfill sites.	-5	CbA	Protecting of soil integrity.	Zero presence of contaminated land due to early detection and implementation of actions.					x	Soil integrity	Contracts must be in place for the provision of chemical toilets where required.  Removal companies must have the necessary contracts and permits in place.	SHEQ Department	Daily internal inspections  Annual review of supply and removal companies' contracts and permits.
	Ecology	The unmanaged disposal of waste, could result in the spread of invader species, as well as the influx of opportunistic species.	-12	Develop dedicated waste handling areas; prevent access to rodents and opportunistic species; prevent the spread of waste.  Develop dedicated waste handling areas, fit for purpose and prevent the spread of waste.	-5	CbA	Proper waste management practices on site.	No unlawful disposal of waste.  Registration of all waste handling and/or storage areas on site.	x				x	Ongoing rehabilitation	Ongoing waste classification and management processes to be implemented.  Updated waste inventory to be available on site.  Waste Management and Handling Procedure to be available on site and updated regularly.	SHEQ Department	SHEQ: Weekly inspections.  Regular update in terms of procedure requirements.  Waste Classification of wastes every five (5) years.
	Riparian Habitat and Wetlands	The construction activities are in close proximity to the	-11	Remain at all times outside of the 1:100 year flood line of the Springkaanspruit	-5	CbA	Remain within or approve upon the current aquatic	Improve upon the current aquatic health and water	x				x	Compliance in terms of the current WUL.	Ongoing aquatic biomonitoring and water quality assessments.	Aquatic Specialist	Surface water and aquatic biomonitoring in line with the

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		Springkaanspruit and its associated riparian zone.		unless approved in terms of the necessary legislation. No waste is permitted to be disposed of within any freshwater habitat, and it must be ensured that all waste are removed to an appropriate disposal facility. Ongoing aquatic biomonitoring should be undertaken at the upstream and downstream points of perennial point sources. Ongoing surface water monitoring should be undertaken at the upstream and downstream monitoring points. Develop dedicated waste handling areas, fit for purpose and prevent the spread of waste.			health and water quality baseline conditions.	quality baseline conditions.						Demarcation on site of all activities to be undertaken.		current monitoring programme.
	Surface Water	Handling of hazardous waste (such as contaminated soils) could contaminate the dirty water storage areas. The water is then reused in the system and could have impacts on the integrity of the storm water system and also the production.	-11	Clean and dirty water separation systems should be incorporated into the designs. A detailed waste management strategy will be established and implemented, which will clearly demarcate the containments for different waste streams. Waste management training must be implemented on site. Clear signs informing staff of waste	-5	CbA	Protect the integrity of the Storm Water Management System.	Implement the clean and dirty water systems on site.  Aim to achieve a zero-spill record.	x				Surface Water Pollution & Soil Assessments.	To ensure a proactive approach, the SHEQ Department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements.  The water quality (constituents listed in the WUL)	SHEQ Department	Assessments: Weekly. Monitoring: As per approved WUL  Reporting of incidents in terms of Environmental Authorisations, but generally within 24 hours of occurrence.  Update of the Incident Reporting Procedure in

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				management practices must be implemented on site.										must be monitored and records must be kept of these results in a centralised system. Analysis of results must be undertaken by an accredited laboratory.  An incident reporting procedures should be available on site and definitions must be developed to determine when an incident is reportable.  Reportable incidents should be reported to the Regulatory Authority as per the regulatory requirements, as well as stipulations as part of the WUL and Environmental Authorisations.		terms of the procedure requirements.
				Hazardous waste handling should only take place within bunded and/or lined areas.												
				Hazardous waste should be removed by a licensed hazardous waste removal company and taken to a suitable and licensed landfill site.				Maintain a 100% safe disposal record on the disposal of hazardous waste.				x				
				Clean spills, if spills occur, within 24 hours.												
				Documentation of removal and safe disposal must be available on site.												
				The mine will adopt a cradle-to grave approach to ensure that the waste is removed and disposed of in a legally compliant manner.												
				Notify the relevant regulatory authorities in the event of the occurrence of a reportable incident.				Provide training to all staff on best practices regarding waste management every year.	x			x				
				Weekly inspections of storm water management systems must be undertaken. Any blockages or maintenance requirements must be documented, and an action plan developed.												
				Clean and dirty water separation systems should be												

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
		Handling and storing of domestic waste should have no impact on the surface water resources due to the location of the facility. However, incorrect disposal of waste could hamper the integrity of the storm water system.	-9	incorporated into the designs.	-5	CbA		Maintain a 100% compliance with the requirements as set in the Norms and Standards of the NEM:WA.	x							
				Clean and dirty water separation systems should be incorporated in terms of the clean and dirty water system or any approved update thereafter.												
				Waste management training must be implemented on site.												
				Weekly inspections of storm water management systems must be undertaken. Any blockages or maintenance requirements must be documented, and an action plan developed.												
				Clear signs informing staff of waste management practices must be implemented on site.												
				Access control must be strictly enforced.												
				Waste should be disposed of by licensed companies to licenced facilities.												
				Recycling practices must be investigated and implemented on site.												
	Groundwater	Handling of hazardous waste within the construction area.	-8	Clean and dirty water separation systems should be incorporated. The area should have suitable waste bins during construction and decommissioning practices.	-5	CbA	Protect the groundwater resources to ensure that limited to no impact on groundwater resources occur as a result of	Achieve 100% compliance to the water quality objectives as agreed to between the mine and the DWS based on the discussions		x		x	Groundwater Pollution and potential trends & Soil Assessments.	To ensure a proactive approach, the SHEQ Department should undertake ongoing site monitoring to determine	SHEQ Department	Assessments: Weekly. Monitoring: Quarterly (construction); Biannually (after construction)

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency	
				Waste management training must be implemented on site.			the mining operations.	within this IWWMP.					whether activities on site are undertaken in accordance with the EMP Requirements.			
				Clear signs informing staff of waste management practices must be implemented on site.												
				Hazardous waste handling should only take place within bunded and/or lined areas, with a capacity of at least 110% of the volume stored.												
				Hazardous waste should be removed by a licensed removal company and taken to a suitable and licensed landfill site.												
				Documentation of removal and safe disposal must be available on site.												
	Air Quality	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Heritage	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Noise	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Visual	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Social	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	



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Table 36: Decommissioning Phase Impact Table with Management Measure, Objectives and Standards

Name of Activity		Potential Impacts	Rating	Mitigation Type	Significance	Time Period for Implementation				Action Plan						
Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
<b>Decommissioning and Closure Phase</b>																
Legal Requirements (Environmental Permits)	Legal Compliance	Unlawful activities could lead to NWA Directives and Section 24G Rectification fines.	-14	A legal assessment of all activities must be undertaken annually to ensure that all are licensed.	17	CbA	To operate within the enviro-legal ambits of South Africa.	Ensure that all activities undertaken by the mine are lawful with the required environmental licences in place.					Compliance in terms of Regulatory Requirements and the implementation of the EMP.	Appointment of an Independent ECO to assess compliance with the EMP.	Independent ECO & SHEQ Department	Quarterly: SHEQ Weekly: SHEQ
				A detailed closure plan must be developed and submitted to the relevant departments for approval.			Ensure that all environmental authorisations on site is implemented on site and ongoing monitoring of compliance are undertaken to reach 100% compliance.	Quarterly internal audits must be undertaken during the construction phase, where after biannual internal audits can be undertaken, to ensure compliance with the Environmental Authorisation and EMP. This should be undertaken by means of a thorough site visit, record keeping of findings in a checklist format, issuing of non-conformances to responsible parties, listing thereof on the Isometrics or similar reporting system and feedback to the management team.								
				All legally appointed personnel responsible or involved in activities on site must receive training on the requirements of the Environmental Authorisations and EMPs			To be aware of the latest environmental legal requirements.	All Departments responsible for development of the mine, must understand the requirements of the environmental legislation and must involve this into their planning processes.								
				Quarterly decommissioning internal audits must be undertaken, on the lawful implementation of the Environmental Authorisation												
				Copies of Environmental Authorisations must be available on site at all times.												
To ensure that the conditions of the NWA and associated WUL are met, the																

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Name of Activity	Impact Area	Potential Impacts	Rating	Mitigation Type	Significance		Performance Objectives	Goals	Time Period for Implementation				Action Plan				
		Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r			Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency	
			-	channel may only be removed once the dirty water area has been rehabilitated. The legal register must be updated to indicate all updated activities.	-												
Earth Moving, shaping and ripping of ground	Geology	No direct impact	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Topography	The shaping of the site should be undertaken in such a manner that it improves the overall topography of the site.	13	Suitable landscape topography should be reasonably restored through shaping and landscaping, such that the topography of rehabilitated areas will ultimately be commensurate with that of adjacent, non-disturbed areas.  The final shaping should be viable to allow for potential agricultural activities and grazing opportunities post-mining. If possible, ensure a continuation of the pre-mining surface drainage pattern.	14	-	Develop the area to its intended final land use.	Implement an action plan to systematically plan for closure.					x	Final Land use	An operational rehabilitation plan must be implemented and audited by the SHEQ Department.	SHEQ Department	Monthly monitoring.
	Soils	Soil erosion	-16	Revegetate as soon as possible should self-succession not be suitable.	-5	CbA	Develop the area to its intended final land use.	Continuous rehabilitation of the decommissioning area will be conducted in line with the Best Practice Guidelines released by the DWA.									
	Ripping and topsoil replacement will restore the soil physical characteristics prior to re-vegetation.	13	Compacted soils will be ripped, and topsoil will be replaced. After the topsoil has been replaced the area should be ameliorated and seeded, should self-succession of vegetation not take place. Only species indigenous to the	14	CbA					x	x	Soil Erosion and incorrect stockpiling of topsoil.	Erosion protection measures should be implemented and monitored on areas identified. Photographic records of assessments must be kept.	Independent ECO and SHEQ Department			

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								Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				area will be included. The soil fertility status should be determined by soil chemical analysis after levelling (before seeding/re-vegetation. Soil amelioration should be done according to soil analyses as recommended by a soil specialist, to correct the pH and nutrition status before revegetation. Where sites have been alienated of vegetation or where soils have been compacted or covered with concretes, these sites will be ripped and ploughed. The topsoil and sub-soils with the appropriate seedbed as stripped during the construction phases will be placed over these areas to a depth as specified by a qualified specialist. The topsoil shall be appropriately ameliorated to allow vegetation to grow rapidly if required – it should be noted that the mine will encourage self-succession of vegetation, if this does not take place effectively a re-vegetation project will be implemented											

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
	Terrestrial Ecology (Fauna & Flora)	The rehabilitation of the site will allow reestablishment of natural vegetation.	10	<p>No additional habitat is to be disturbed during the Decommissioning &amp; Rehabilitation Phase of the development.</p> <p>No vehicles are allowed to indiscriminately drive through sensitive habitat and natural areas.</p> <p>During the decommissioning, the decommissioning of temporary access roads or infrastructure (e.g., the proposed stormwater trench) should be implemented. All impacted and disturbed areas should be ripped, reprofiled and reseeded with indigenous species from the region that will assist to stabilise soils as soon as possible.</p> <p>All infrastructure footprints that will be decommissioned should be concurrently rehabilitated in accordance with a rehabilitation plan compiled by a suitably trained specialist.</p> <p>All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological</p>	13 CbA	Protect the ecology within which the mine operates.	Free draining environment with successful self-succession in place.				x	Invasion of Weeds and AIPs.	An AIP plant species eradication plan must be implemented on site. This must be undertaken prior to the growing season. An ecological study should be undertaken to determine the status of vegetation establishment on the site especially around the rehabilitated areas.	SHEQ Department and a Specialised Ecologist	<p>AIP monitoring (monthly).</p> <p>AIP eradication (annually or as required).</p> <p>Ecological Study (annually).</p>

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								Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
Activities		Potential Impacts	SbM	Mitigation Measures	SaM CbA /R/I r										
				functioning and biodiversity of the area to be re-instated as per the post-closure land-use objective.											
				Rehabilitation efforts must be implemented for a period of at least five years after decommissioning. A mix of indigenous grass seeds can be used during rehabilitation activities.											
				Monitoring of rescued and relocated floral SCC should continue during the Decommissioning & Rehabilitation phase until it is evident that the species have successfully established.											
				As far as possible, no collection of floral SCC within the proposed footprint area or adjacent natural habitat must be allowed during the Decommissioning & Rehabilitation phase of the development.											
				Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC or suitable habitat for such species outside of the proposed development footprint.											



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		Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r			Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency	
	Wetland	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hydrology	Runoff from rehabilitated areas will impact on watercourses especially during intensive rainstorms especially if the area is not free draining.	-5	Berms, should they be necessary, must remain upstream and downstream of the areas to ensure that clean water is kept separate from dirty water until the area is free draining and re-vegetation has occurred.	13	CbA	Protect the water resources within the area in which the mine operates.	Continuous rehabilitation of the decommissioning area will be conducted in line with the Best Practice Guidelines released by the DWA.	x					Surface Water Pollution & Soil Assessments.	To ensure a proactive approach, the SHEQ department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements. The water quality (constituents listed in the WUL) must be monitored monthly and records must be kept of these results in a centralised system. Analysis of results must be undertaken by an accredited laboratory. Monitoring of the effectiveness of the rehabilitation programme must be undertaken. This should be undertaken by means of weekly inspections and keeping a photographic record.	SHEQ Department	Assessments: Weekly. Monitoring: Monthly
	Geohydrology	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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					SaM	CbA /R/I r			Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency	
	Heritage	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Visual	The rehabilitation (ripping, topsoil replacement and landscaping) will remove the visual incongruity.	11	An overall visual improvement will be noticed once all mining related infrastructure has been demolished and the area has been landscaped and re-vegetated.	13	CbA	Successful establishment of vegetation.	Remain within the designated area demarcated for activities.  Remain within the NEM:AQA Dust Regulation guidelines for rural communities.					x	Comply with the National Dust Regulations.	Dust dispersion will be monitored as part of the overall mine dust monitoring programme.	SHEQ Department	Monthly Monitoring with Annual Reporting.
				Demarcate the decommissioning area and limit the decommissioning activities as far as possible.													
				Final shaping will be implemented such that the final profile of the rehabilitated areas is formed to emulate natural contours of the area.													
				Foundations will be removed to a depth of 500m below the surface and the area rehabilitated.													
				All material recovered from the demolition of buildings and/or structures will either be transported to a permitted disposal site or made available to the local community as building materials (provided they are in										Vegetation Establishment.	An ecological study should be undertaken to determine the status of vegetation establishment on the site especially around the rehabilitated areas.	SHEQ Department	Monthly

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				a satisfactory condition following demolition). Linear infrastructure will be removed if it proves to inhibit land use at decommissioning. All fences erected around the site will be dismantled and disposed of at a permitted disposal site.												
	Air Quality	All activities associated with the removal of infrastructure has the potential to release dust.	-7	Dust sampling will be undertaken on a monthly basis. Monthly monitoring reports will be generated by the mine or through a suitably qualified air quality specialist. In the event that air quality or dust issues are identified based on the monitoring programme, an independent specialist should be appointed to determine the best course of action to ameliorate the situation.	-5	CbA	No concerns raised by surrounding landowners regarding air quality.	Remain within the designated area demarcated for activities.  Remain within the NEM:AQA 2004 Dust Regulation guidelines for rural communities.	x			x	Dust dispersion.	Dust dispersion will be monitored as part of the overall mine dust monitoring programme.	SHEQ Department	Monthly Monitoring with Annual Reporting.
	Noise	All activities associated with the removal of infrastructure and rehabilitation has the potential to generate noise.	-4	The removal of all infrastructure is to take place during daytime periods only. Where noise becomes a nuisance, management measures will be investigated and implemented to address these.	-5	CbA	No concerns raised by surrounding landowners regarding air quality.	Remain within the designated area demarcated for activities.	x			x	Noise Monitoring.	Adjacent landowners will be informed of the planned dates of the significant demolition activities where applicable. Daily noise monitoring will be	SHEQ Department	Regular noise monitoring.

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				Machinery with low noise levels and maintained in a good order to be used and to comply with the International Finance Corporation's (IFC) Health and Safety Regulations.										undertaken in the areas where high levels of noise take place during decommissioning .		
				Speed control measures will be implemented by the mine through the placement of adequate signage.												
				Implement a penalty system for non-compliance to speed control measures and ensure that all workers are made aware of the penalty systems.				Remain within the NEM:AQA, 2004 Dust Regulation guidelines for rural communities.								
				Gravel roads to be maintained in as good and smooth a condition as possible is the use thereof is still required.												
	Social	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Geology	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Topography	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste Management	Soil, Land Use and Land Capability	Spills around the diesel storage areas and product stockpiles may result in the contamination of soils.	-11	Any hydrocarbon, effluent or other contaminants should be collected, and the soils remediated immediately.	-5	R	Protection of Soil Integrity to achieve final land use objectives.	Zero presence of contaminated land due to early detection and implementation of actions.		x	x	x	Protection of Soil Resources.	Compliance with contaminated land objectives and limits.	SHEQ Department	Ongoing
	Terrestrial Ecology (Fauna & Flora)	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Wetland	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Groundwater	Handling of hazardous waste.	-10	Clean and dirty water separation systems	-6	CbA	Protect the groundwater	Achieve 100% compliance to		x		x	Groundwater Pollution and	The groundwater quality	SHEQ Department	

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				should be maintained until rehabilitation has been successful.			resources to ensure that limited to no impact on groundwater resources occur as a result of the mining operations.					potential trends.	(constituents listed in the WUL) must be monitored monthly and records must be kept of these results in a centralised system. Analysis of results must be undertaken by an accredited laboratory			
				Waste management training must be implemented on site.												
				Clear signs informing staff of waste management practices must be implemented on site.												
				Hazardous waste handling should only take place within bunded and/or lined areas.												
				Hazardous waste should be removed by a licensed removal company and taken to a suitable and licensed landfill site.												
				Documentation of removal and safe disposal must be available on site.												
				All infrastructure will be removed and rehabilitated, should no alternative use be found for the structures.												
				Foundations will be removed to a depth of 500mm below surface.												
	Handling of Building Rubble		-9	All building rubble will follow the waste hierarchy and will therefore either be sold for reuse where possible and as a last option be disposed of at a licensed facility suitable for such waste.	-6	CbA	Implement and operate a detailed waste manifest on site and maintain a 100% safe disposal record on the disposal of waste on site.									
			-12	Clean and dirty water separation systems	-9	CbA	Achieve 100% compliance to			x					Quarterly (decommissioning)	



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		Handling and Storing of Domestic Waste		should be maintained up until rehabilitation has been successful.				the water quality objectives as per the WUL													
				Waste management training must be implemented on site.																	
				Clear signs informing staff of waste management practices must be implemented on site.																	
				Groundwater monitoring must be undertaken in such a manner as to ensure that any potential impacts from the site can be detected.									Legal compliance in terms of the disposal of waste.								
				Recycling practices must be investigated and implemented on site.				Maintain a 100% accurate recording of waste and submission of such recording to the Department.													
	Surface Water	Handling of Hazardous Waste within workshops and general mine area could contaminate the dirty water storage areas. The water is then reused in the system and could have impacts on the integrity of the storm water system and also the production.	-11	Clean and dirty water separation systems should be maintained up until closure.	-6	CbA	Develop the area to its intended final land use.	Maintain the clean and dirty water system on site.													
				Waste management training must be implemented on site.																	
				Clear signs informing staff of waste management practices must be implemented on site.									Clean spills, if occur witan 24 hours.								
				Hazardous waste handling should only take place within bunded and/or lined areas.									Maintain a 100% safe disposal record on the disposal of hazardous waste.								
				Hazardous waste and contaminated materials should be removed by a licensed removal company and taken									Provide training to all staff on best practices regarding waste management every year.								
													Surface Water Pollution & Soil Assessments.	To ensure a proactive approach, the SHEQ Department should undertake ongoing site monitoring to determine whether activities on site are undertaken in accordance with the EMP Requirements. The water quality (constituents listed in the WUL) of the dam must be monitored monthly and records must be kept of these	SHEQ Department	Assessments: Weekly. Monitoring: Monthly					

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Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Performance Objectives	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency
				to a suitable and licensed landfill site.									results in a centralised system. Analysis of results must be undertaken by an accredited laboratory.		
				Documentation of removal and safe disposal must be available on site.											
				Weekly inspections of storm water management systems must be undertaken until successful rehabilitation has been achieved. Any blockages or maintenance requirements must be documented, and an action plan developed.											
	Handling and storing of domestic waste should have no impact on the surface water resources due to the location of the facility. However, incorrect disposal of waste could hamper the integrity of the storm water system.		-9	Clean and dirty water separation systems should be maintained up until closure.		-5	CbA	Maintain 100% compliance with safe disposal practices.	x			x			
				Waste management training must be implemented on site.											
				Weekly inspections of storm water management systems must be undertaken. Any blockages or maintenance requirements must be documented, and an action plan developed.											
				Clear signs informing staff of waste management practices must be implemented on site.											
				Recycling practices must be investigated and implemented on site.											
				Building rubble must be disposed of in line with the											
								Self-succession of vegetation should establish	x			x			

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Name of Activity	Potential Impacts	Rating	Mitigation Type	Significance	Performance Objectives				Time Period for Implementation				Action Plan			
Activities	Impact Area	Potential Impacts	SbM	Mitigation Measures	SaM	CbA /R/I r	Goals	Short Term (1-12 months)	Medium Term (1-5 years)	Long Term (5 Years +)	LoM	Compliance with Standard	Functional Requirements for Monitoring	Responsibilities	Monitoring and Reporting Frequency	
				requirements of the NEM:WA. Access control must be strictly enforced.			within the first rainy season after construction has been completed.									
	Air Quality	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Heritage	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Visual	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Air Quality	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Noise	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Social	No direct impact	-	-	-	-	-	-	-	-	-	-	-	-	-	

## 1.e Impact Management Outcomes

Please refer to the previous section and Table 34 to Table 36 providing a detailed description of the management objectives and the standards required to be achieved.

## 1.f Impact Management Actions

Please refer to the previous section and Table 34 to Table 36 providing a detailed description of the management objectives and the standards required to be achieved.

### 1.f.i Financial Provision

The rehabilitation and liability estimate for the proposed project related to this application only was determined as a clean closure estimate, with no allowance for off-sets or salvage value. The assessment was conducted in accordance with the DMR Guideline and current best practice.

A Total of approximately R 364 938,42 (excluding VAT, P&Gs and Contingencies), will be required.

The financial provision required by the holder of the mining right must be provided for by one or more of the following methods in order to achieve the total quantum of rehabilitation and remediation of environmental impacts and damage as well as final closure:

- ☞ Approved dedicated trust fund;
- ☞ Financial guarantee from a South African registered bank or any other approved financial institution;
- ☞ Cash deposit to be deposited at the office of the Regional Manager; or
- ☞ Any other manner determined by the Minister.

The mine is required to annually assess the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure), as well as the end of life liability.

As per Government Legislature, the mine is required to ensure full financial cover for the current liability at any point in the life of the operation. Pecuniary provision must be made for the shortfall between the existing trust fund balance and the premature closure or current environmental rehabilitation liability if applicable.

Please refer to Section 3.t of Part A for the detailed discussion.

#### 1.f.i.1.a Describe the Closure Objectives and the Extent to which they have been aligned to the Baseline Environment described under the Regulation

The closure objectives of this project, therefore, will tie into the overall mine's closure objectives, which includes:

- ☞ To operate within the enviro-legal ambits of South Africa.
- ☞ To be aware of the latest environmental legal requirements.
- ☞ Limit the impact of the activities on the ecological setting of the area.
- ☞ Operate the water management circuit on site to increase mining efficiency and reduce the need for maintenance of these facilities.
- ☞ Limit the loss of soils as far as possible and ensure that the integrity remains during stockpiling for the purposes of successful rehabilitation.
- ☞ Remain within the designated area demarcated for activities.
- ☞ Remain within the NEM:AQA Dust Regulation guidelines for rural communities.
- ☞ Protect heritage resources for future generations.
- ☞ Follow the waste hierarchy approach.
- ☞ Protect the integrity of the clean and dirty water system.
- ☞ Return the area to its intended final land use.

The closure objectives have been developed to reach the final land use as defined in the mine's Rehabilitation Plan, December 2016. The overall objectives of the closure plan are to achieve the following:

“The proposed final land use would be to return the area to wilderness area. This would include demolishing all infrastructure that will not be handed over to a third party and promoting the growth of the surrounding Sekhukhune Mountain Bushveld species. It is evident that the re-establishment of this vegetation type on site will not be difficult as areas that have already undergone rehabilitation have seen a large success in terms of the revegetation.”

Please refer to the previous section and Table 34 to Table 36 providing a detailed description of the management objectives and the standards required to be achieved.

*1.f.i.1.b Confirm specifically that the Environmental Objectives in relation to Closure have been consulted with Landowner and Interested and Affected Parties*

Please refer to Part A, Section 3.i for the detailed discussion regarding I&AP Consultation.

The mine’s current Stakeholder Database was utilised as a basis for the development of the consultation register for this project. In addition, relevant government departments, municipalities and affected ward councillors were contacted to inform them of the proposed project and to obtain their issues and comments in this regard. The following stakeholders were consulted as part of the project:

- ☞ DWS;
- ☞ DMRE;
- ☞ LEDET;
- ☞ Local Municipality;
- ☞ District Municipality;
- ☞ Surrounding Landowners; and
- ☞ Other Identified Stakeholders.

Please refer to Annexure 4 for the list of stakeholders consulted.

Stakeholder Identification and Notification

Notification of I&APs commenced on 8 March 2023. The notification process was undertaken by means of the following:

- ☞ Newspaper advertisements;
- ☞ Site Notices;
- ☞ Direct Notifications through a BID.

All registered stakeholders were informed of the availability of the draft BAR on 12 April 2023 for the opportunity to review this document.

*1.f.i.1.c Provide a Rehabilitation Plan that Describes and Shows the Scale and Aerial Extent of the Main Mining Activities, including the anticipated Mining area at the time of Closure*

Refer to the following table, which is included to present the rehabilitation plan for the listed activities in question.

The intention of the rehabilitation plan is that the mining area is fully rehabilitated to its intended final land use.

Please refer to the areas specifically highlighted which will be applicable to this project.



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Table 37: Rehabilitation Plan

	Requirement	Target	Responsible Person	Timeframes
<b>General Surface Rehabilitation</b>				
<b>A</b>	<b>Planning</b>			
A1	The closure plan will be reviewed during the life of the mine (closure, operational and decommissioning phases) as part of the NEMA Regulations for financial provision.	Legal closure review compliance.	Environmental Specialist	Annually during operational phase.
A2	Notify the DMRE of intended cessation of mining activities and rehabilitation in accordance with the NEMA.	Notification.	Environmental Department	Five years prior to closure
A3	Apply for the necessary Environmental Authorisation for the decommissioning of activities in terms of the NEMA, NEMWA and NWA.	Environmental Authorisation.	Environmental Department	At least 2 years prior to intended decommissioning.
A4	Appoint a project manager to oversee the process	Appointment of suitably qualified project manager.	Mine Manager	Prior to the commencement of closure planning and implementation.
A5	Identify any protected species that may require permitting prior to disturbing.	Biodiversity and Tree/ Plant removal Permits	Environmental Specialist	Prior to commencement of rehabilitation.
A6	A storm water management plan (clean and dirty water separation) for the purposes of rehabilitating towards the final land use should be developed.	Free draining environment	Hydrologist/Engineer	Prior to commencement of rehabilitation.
A7	If any archaeological artefacts of potential significance are identified at any stage, work must cease and SAHRA must be notified for instruction on how to proceed.	Protection of artefacts	Environmental Specialist	Ongoing
A8	If an agreement is to be reached with the community and or any other organization to take over the occupation of one or more buildings, then a formal agreement to that extent needs to be entered into and signed by all parties concerned. The DMR also needs to be alerted to this fact, and adequate legal arrangements need to be made in this regard.	Optimal use of infrastructure to the benefit of the IDP.	Mine Manager and Human Resources Department	Five years prior to closure.
A9	Rehabilitation should preferably be undertaken before the first rains start in order to prevent erosion	Prevent Erosion.	Project Manager	Start of rehabilitation.
<b>B</b>	<b>Removal of Surface Infrastructure and Structures</b>			
B1	Photographs of the infrastructure, before, during and after rehabilitation will be taken at selected fixed points and kept on record for the Manager (Group Environmental Department) and the DMR purpose	Documentation of rehabilitation process.	Environmental Department	Ongoing
B2	All temporary buildings (prefabricated buildings) should be removed and their footprints rehabilitated.	Surface rights area cleared up of all mining related infrastructure and structures.	Project Manager	Ongoing
B3	All fixed assets that can be profitably removed will be removed for salvage or resale (the salvage and resale value have however not been incorporated into the closure cost estimate as per the legislative requirements)	Surface rights area cleared up of all mining related infrastructure and structures.	Project Manager	Ongoing
B4	All surface structures, infrastructure and 'hard surfaces' (inter alia, redundant surfaced roads, parking and paved areas) are to be demolished and removed from the disturbed mine footprint; unless an alternative/continued use for any such items is agreed upon, in writing, with the DMRE.	Surface rights area cleared up of all mining related infrastructure and structures.	Project Manager	Ongoing
B5	Any item that has no salvage value to the mine but could be of value to individuals will be treated as waste, unless otherwise defined in terms of the NEMWA	Surface rights area cleared up of all mining related infrastructure and structures.	Project Manager	Ongoing
B6	All surface infrastructure would be demolished and removed to a depth of 500mm. Any infrastructure below 500mm will be sealed, made safe and left in situ.	No remaining sub-surface structures that may impede further phases of rehabilitation or vegetation establishment.	Project Manager	Ongoing
B7	Dismantle and remove redundant fencing for salvage.	Surface rights area cleared up of all mining related infrastructure and structures.	Project Manager	Ongoing

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	Requirement	Target	Responsible Person	Timeframes
B8	Water pollution control structures will remain until the completion of all demolition and associated rehabilitation activities where after these will be rehabilitated.	Free draining environment	Hydrologist/Engineer	Prior to commencement of rehabilitation.
B9	The soils beneath any structures used for the bulk storage of hazardous substances (i.e. bulk fuel and oil storage facilities, oil-water separators/sumps), must be made subject to a hydrocarbon contamination screening exercise undertaken by a suitably qualified, independent, professional.	Documented proof of contamination assessments on record. Compliance with any further recommendations from appointed specialist prior to further rehabilitation of contaminated site(s).	Project Manager	Ongoing
<b>C</b>	<b>Discard Dump and Slope Preparation (No applicable to this Application)</b>			
<b>D</b>	<b>Surface and Soil Preparation</b>			
D1	Existing waste rock dumps will be entirely used to fill the existing voids and excess material will be employed for mining and vent shaft closure	Area to be free draining.	Mine	Ongoing
D2	Where sites have been alienated of vegetation or where soils have been compacted or covered with concretes, these sites will be ripped and ploughed.	No topsoil replacement on compacted soil horizons.	Project Manager	Ongoing
D3	The topsoil and sub-soils with the appropriate seedbed as stripped during the construction and operational phases will be placed over these areas to a depth as specified by a qualified specialist. The topsoil shall be appropriately ameliorated to allow vegetation to grow rapidly if required – it should be noted that the mine will encourage self-succession of vegetation, if this does not take place effectively a re-vegetation project will be implemented	Replacement of fertile topsoil.	Soil Scientist	Ongoing
D4	On-going alien and invasive floral species control are required through all phases of rehabilitation.	No establishment of alien and invasive plant species.	Ecologist or Environmental Scientist	Ongoing inspections.
D5	Pre-mining topography should be reasonably restored through shaping and landscaping, such that the topography of rehabilitated areas will ultimately be commensurate with that of adjacent, non-disturbed areas.	No evidence of significant alteration.	Project Manager	Ongoing
D6	A post rehabilitation surface contour plan should be developed by the mine in consultation with a specialist surface water hydrologist, such that would then inform implementation of the point above.	Post-mining contour plan on record. Said plan mitigates potentially significant impacts of surface hydrology.	Mine, Specialist Hydrologist	Once-off, within 12 months of EMP approval.
D7	The areas will be landscaped to be free draining in line with the approved storm water management plan.	Area to be free draining.	Project Manager	Ongoing
D8	If a reasonable assessment indicates that the re-establishment of vegetation is unacceptable slow, the soil needs to be analysed and any deleterious effects must be corrected, and the area be seeded with a seed mix to specification	Successful vegetation establishment.	Ecologist	Ongoing inspections.
D9	Appropriate erosion control measures (i.e. contour banks) must be taken where required	No evidence of significant alteration.	Project Manager	Ongoing
D10	Care should be taken in choosing a method/machinery to implement the above, such that ripped soils are not re-compacted through efforts to appropriately shape the disturbed sites.	No topsoil replacement on compacted soil horizons.	Project Manager	Ongoing
D11	Access to rehabilitated areas should be restricted to vehicles/machinery specifically required for the implementation of the closure plan.	No unauthorised access.	Project Manager	Ongoing
<b>E</b>	<b>Soil and Basal Cover replacement</b>			
E1	A topsoil/gravel mixture should be replaced over all rehabilitated area. Where topsoil is insufficient, subsoil must be treated in accordance with the specification of a soil specialist. The layer of topsoil on the side slopes and other areas should be at least 300 mm thick to aid plant growth and assist in re-generation of indigenous plants.	Replacement of fertile topsoil.	Soil Scientist	Ongoing
E2	Topsoil should be screened, as necessary, to remove any foreign objects, rocks, etc., prior to the replacement thereof.	Replacement of topsoil that is fit for purpose.	Soil Scientist	Ongoing
E3	After application of the topsoil, Hessian socks should be installed in order to prevent erosion of the topsoil, increase soil stability and supply secure substrate for seed germination on any area which has a slope of	Slope stability/safety, effective plant establishment and no signs of erosion.	Mine	Once-Off



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	Requirement	Target	Responsible Person	Timeframes
	greater than 1:4. These Hessian socks should be placed at 500mm intervals along the contours which are filled with a hydro seeding mixture			
E4	Any areas with slope $\geq 3^\circ$ should be inspected weekly for signs of topsoil erosion following the replacement thereof, and appropriate action taken to curb any problematic areas.	No evidence of significant alteration.	Project Manager	Ongoing
E5	Self-succesion should be encouraged. One rainy season will be allowed for self-succesion to take place.	Successful vegetation establishment	Ecologist	Ongoing inspections.
E6	If a reasonable assessment indicates that the re-establishment of vegetation is unacceptable slow, the soil needs to be analysed and any deleterious effects must be corrected, and the area be seeded with a seed mix to specification. Should self-succesion of vegetation not take place, the mine will implement a vegetation strategy (hydro seeding) to establish vegetation on these disturbed areas. Appropriate erosion control measures (i.e. contour banks) must be taken where required.	Successful vegetation establishment.	Ecologist	Ongoing inspections.
E7	A suitably qualified hydro-seeding specialist should be contracted to perform the seeding process.	Successful vegetation establishment.	Ecologist	Start of rehabilitation.
E8	A grass mixture utilising endemic (Sekhukhune Mountain Bushveld) grasses should be utilised in the seeding process. Note that hydro-seeding is primarily for grasses and smaller shrubs. Larger shrubs and trees will need to be hand-planned.	Successful vegetation establishment.	Ecologist	Start of rehabilitation.
E9	The seed mixture should be incorporated into mulch which includes fertiliser and germination acceleration agents	Successful vegetation establishment.	Ecologist	Start of rehabilitation.
E10	The seed mulch should then be used to fill the Hessian socks	Successful vegetation establishment.	Ecologist	Start of rehabilitation.
E11	The seeded areas should then be irrigated according to the recommendation of the hydro-seeding specialist	Successful vegetation establishment.	Ecologist	Start of rehabilitation.
E12	Weekly monitoring should take place in order to ascertain the efficacy of the hydro seeding and to repair any areas where gulleys or rills are forming	Successful vegetation establishment.	Ecologist	Weekly
E13	Regular application of fertiliser should take place in order to ensure efficient establishment of vegetation cover until such time as sufficient organic matter is being produced by the established grasses to allow for self-sustaining growth	Successful vegetation establishment.	Ecologist	When required.
E14	Weekly monitoring should take place in order to ascertain the efficacy of the seeding, and to repair any areas where gulleys or rills are forming. Appropriate interventions to be adopted where basal cover establishment fails.	Documented records of weekly inspections. Basal cover establishments commensurate with adjacent undisturbed areas over the surface rights areas (i.e. %cover relative to exposed soil surfaces)	Mine. Contractor	Weekly monitoring until adequate basal cover establishment has been confirmed by ecological specialist.
E15	Regular application of fertiliser, under the guidance of a suitable qualified soil scientist, should take place in order to ensure efficient establishment of vegetation cover until such time as sufficient organic matter is being produced by the established grasses to allow for self-sustaining growth.	Basal cover establishment commensurate with adjacent undisturbed areas over the surface rights areas (i.e. %cover relative to exposed soil surfaces).	Mine. Soil Scientist	On-going as per specialist recommendations.
E16	If re-seeding for basal cover establishment was not effective during 1 <sup>st</sup> application, a second application of hydro-seed mixture may have to be applied in certain areas. The application of hydro-seed should be at the discretion of the specialist contractor.	Basal cover establishment commensurate with adjacent undisturbed areas over the surface rights areas (i.e. % cover relative to exposed soil surfaces).	Mine. Contractor	As necessary, per specialist recommendations.
E17	No grazing on rehabilitated areas is to occur within three years of reseeded completion.	Documentation of rehabilitation process.	Project Manager	Three years from re-seeding.
<b>F</b>	<b>Establishment of Natural Sekhukhune Mountain Bushveld on the Rehabilitated Areas</b>			
F1	Once sufficient basal cover has been established, the introduction of species representative of the Sekhukhune Mountain Bushveld vegetation type may commence.	The primary goal is to achieve a stable, climax state, representative of the Sekhukhune Mountain Bushveld vegetation type where the ecological	Ecologist	Upon successful establishment of basal cover.
F2	Introduction of these species should commence through the stages of natural succession, i.e. Pioneer species (grasses, herbaceous species), Secondary species (grasses, small shrubs, and small trees) and Climax state		Mine	

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	Requirement	Target	Responsible Person	Timeframes
	(larger shrubs, large trees). This process will also occur naturally as seeds from the neighbouring Sekhukhune Mountain Bushveld areas are introduced and germinate	function of the plant community is tolerant of most environmental conditions it encounters		
F3	Certain tree species can be selectively introduced; however, consideration will need to be given to rooting depths and soil stability as well as the ability of the trees to establish on the subject area		Ecologist, Mine	Immediately
F4	A test area should be designated to test possible tree species to be introduced for their ability to grow in different substrates. This should commence immediately in order to allow informed decision-making once rehabilitation commences		Ecologist, Mine	Immediately
<b>G</b>	<b>Disposal of Material</b>			
G1	Waste will be classified in terms of the NEM: WA to determine the required waste disposal strategies.	Classification of waste in terms of the NEMWA.	Environmental Specialist	Prior to the commencement of closure planning and implementation.
G2	Rubble will be disposed of at a suitable site which will be rehabilitated once it serves its purpose. As per the 2009 EMP, the objective was made that the rubble shall be dumped in the waste landfill site on the mine with approval by the relevant authorities. This activity should also comply with the relevant NEMWA requirements.	Safe disposal certificates.	Environmental Department	Ongoing
G3	All types of waste shall be removed entirely from the area and appropriately dealt with in respect of the general waste handling procedure.	Safe disposal certificates.	Environmental Department	Ongoing
G4	Inert ceramics such as bricks, concrete, gravel etc. will be used as backfill or disposed of in a permitted waste disposal site according to the approved EMP, 2009.	Disposal of waste in terms of the NEMWA.	Environmental Department	Ongoing
G5	Inert waste, which is more than 1m underground, such as pipes will be left in place.	Disposal of waste in terms of the NEMWA.	Environmental Department	Ongoing
G6	Inert ceramic and buried waste with a salvage value to individuals such as scrap metal, building materials, etc. will be removed and disposed of at a proper facility.	Disposal of waste in terms of the NEMWA.	Environmental Department	Ongoing
<b>H</b>	<b>Ongoing monitoring and maintenance</b>			
H1	All rehabilitated areas will be fenced off up until the area is regarded as stable.	No unauthorised access.	Project Manager	Ongoing
H2	All illegal invader plants and weeds shall be dealt with as required in terms of the relevant legislation	No establishment of weeds or invasive species.	Environmental Scientist or Ecologist	Ongoing inspections.
H3	External, independent, 'Mine Rehabilitation' compliance audits must be undertaken by a competent auditor for all areas where rehabilitation is being implemented at the mine at least quarterly. Audit to at least document compliance with this plan, as well as any other relevant provisions of the EMP revision approval by the DMRE.	Compliance with closure plan.	External Auditor	Quarterly
H4	The mine should undertake monthly internal compliance audits for all areas where rehabilitation is being implemented at the Mine.	Compliance with closure plan.	Environmental Department	Monthly
H5	Monitoring and maintenance of all natural physical, chemical and biological processes for which a closure condition has been specified must be monitored for three (3) years after closure or as long as required by the relevant authorities. Such processes include erosion of the rehabilitated surfaces, surface water drainage, air quality, surface water quality, groundwater quality, vegetative re-growth, weed encroachment and colonisation by animals.	Compliance with closure plan with at least 90% sustainable establishment of vegetation.	Environmental Department	Ongoing

*1.f.i.1.d Explain why it can be confirmed that the Rehabilitation Plan is Compatible with the Closure Objectives*

The closure plan is based on the intended final land use. The Rehabilitation Plan and commitments are based on the approved financial provision objectives of the mine, as well as the approved EMP.

*1.f.i.1.e Calculate and State the Quantum of the Financial Provision required to manage and rehabilitate the environment in accordance with the applicable Guideline*

Please refer to PART A, Section 3.t for the detailed presentation of the Financial Provision and Calculation.

The rehabilitation and liability estimate for the proposed project infrastructure related to this application only was determined as a clean closure estimate, with no allowance for off-sets or salvage value. The assessment was conducted in accordance with the DMR Guideline and current best practice.

A Sub Total 1 Amount of approximately R 364 938,42 (excluding VAT, P&Gs and Contingencies), will be required.

The financial provision required by the holder of the mining right must be provided for by one or more of the following methods in order to achieve the total quantum of rehabilitation and remediation of environmental impacts and damage as well as final closure:

- ☞ Approved dedicated trust fund;
- ☞ Financial guarantee from a South African registered bank or any other approved financial institution;
- ☞ Cash deposit to be deposited at the office of the Regional Manager; or
- ☞ Any other manner determined by the Minister.

The mine is required to annually assess the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure), as well as the end of life liability.

As per Government Legislature, the mine is required to ensure full financial cover for the current liability at any point in the life of the operation. Pecuniary provision must be made for the shortfall between the existing trust fund balance and the premature closure or current environmental rehabilitation liability if applicable.

*1.f.i.1.f Confirm the Financial Provision will be provided as Determined*

The mine has a trust fund in place to cater for the financial provision of rehabilitation activities. This is assessed annually to ensure that suitable funds are available.

In addition to this, the mine has also signed the undertaking to commit to the conditions as presented in this report.

*1.f.i.1.g Mechanisms for Monitoring Compliance with the Performance Assessment against the Environmental Management Programme, including Monitoring of Impact Management Actions*

Please refer to Table 34 to Table 36. Due to the fact that the proposed project is located in an area already within the mine's dirty water area, the approved monitoring procedures will remain applicable and no additional monitoring is required.

*1.f.i.1.h Mechanisms for Monitoring Compliance with the Performance Assessment against the Environmental Management Programme, including Monitoring and Reporting Frequency*

Please refer to Table 34 to Table 36.

*1.f.i.1.i Mechanisms for Monitoring Compliance with the Performance Assessment against the Environmental Management Programme, including Responsible Persons*

Please refer to Table 34 to Table 36.



*1.f.i.1.j Mechanisms for Monitoring Compliance with the Performance Assessment against the Environmental Management Programme, including Time Period for Implementing Impact Management Actions*

Please refer to Table 34 to Table 36.

*1.f.i.1.k Mechanisms for Monitoring Compliance with the Performance Assessment against the Environmental Management Programme, including Mechanism for Monitoring Compliance*

Please refer to Table 34 to Table 36.

*1.f.i.1.l Indicate the Frequency of the Submission of the Performance Assessment/Environmental Audit Report*

Please refer to Table 34 to Table 36.

*1.f.i.1.l.1 Internal Audits*

Quarterly internal audits should be undertaken during the construction phase, thereafter Annual internal audits can be undertaken to ensure that the conditions of this EMP are implemented.

*1.f.i.1.l.2 External Performance Assessments*

During the construction and closure phases it is recommended that the independent external performance assessments be undertaken biannually.

After the construction activities have been completed, independent external performance assessments should be undertaken annually.

The external performance assessments must also include the overall mine assessment of the financial provision and EMP commitments. The report should be submitted to the DMRE within 30 days of finalisation.

*1.f.i.1.l.3 Other Performance Indicator Assessments*

Due to the dynamic nature in which the mine is addressing the water management on site and considering the near-future projects that are planned, the following measure to ensure that performance measures are reached are recommended:

- ☞ Ongoing water monitoring in terms of the monitoring protocol.
- ☞ Annual update of the IWWMP.
- ☞ Annual update of the Water Balance.
- ☞ Annual update of the Salt Balance.

*1.f.i.1.m Environmental Awareness Plan*

The Environmental Awareness and Emergency Response Procedures as developed by Assore for the Dwarsrivier Mine will be followed.

*1.f.i.1.m.1 Manner in which the Applicant intends to inform his or her Employees of any Environmental Risk which may result from their work*

An Environmental Awareness and Risk Assessment Schedule have been developed and is outlined in Table 38. The purpose of this schedule is to ensure that employees are not only trained but that the principles are continuously re-enforced.

Table 38: Environmental Training and Awareness Schedule

Type of Forum	Frequency	Time allocation	Objective
Internal Management Meetings	Monthly	One-hour workshop	A workshop session in which the following is discussed: <ol style="list-style-type: none"> <li>1. Current status of environmental compliance.</li> <li>2. Environmental concerns and non-compliances recorded.</li> <li>3. Weekly, monthly, quarterly, annually and 5-year mine plan.</li> <li>4. Environmental risks and requirements.</li> <li>5. Action plan.</li> </ol>
Induction (all staff and workers)	Prior to first time site access, and biannually thereafter	1-hour training on environmental awareness training as part of site induction	<ol style="list-style-type: none"> <li>1. Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental, health, safety and community aspects.</li> <li>2. Establish a basic knowledge of the environmental legal framework and consequences of non-compliance.</li> <li>3. Clarify the content and required actions for the implementation of the EMP.</li> <li>4. Confirm the spatial extent of areas regarded as sensitive and clarify restrictions.</li> <li>5. Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents.</li> </ol>
Awareness Talks (all staff and workers)	Weekly	30-minute awareness talks	<ol style="list-style-type: none"> <li>1. Current status of environmental compliance.</li> <li>2. Environmental concerns and non-compliances recorded.</li> <li>3. Based on actual identified risks and incidents (if occurred) reinforce legal requirements, appropriate responses and measures for the adaptation of mitigation and/or management practices.</li> </ol>
Risk Assessments (supervisor and workers involved in task)	Daily	Daily task-based risk assessment	<ol style="list-style-type: none"> <li>1. Establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily toolbox talks.</li> </ol>

1.f.i.1.m.2 Manner in which Risks will be dealt with in order to avoid Pollution or the Degradation of the Environment

As prescribed in Table 38 above, Task / Issue Based Risk Assessments must be undertaken with all workers involved in the specific task in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures.

Environmental emergencies occur over the short term and require an immediate response. A mine, as part of its management tools, especially if it is ISO 9000 and ISO 14001 compliant, should have an Emergency Preparedness and Response Plan in place.

This plan should be placed around the mine where it will be easily viewed. The plan should contain a list of procedures, evacuation routes and a list of emergency contact numbers. It is advisable that the mine tests the Emergency Preparedness and Response Plan in order to identify any areas for improvement.

If the emergency has the potential to affect surrounding communities, they should be alerted via alarm signals or contacted in person. The surrounding community will be informed, prior to mining taking place, of the potential dangers and emergencies that exist, and the actions to be taken in such emergencies.

Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the mine.

Dwarsrivier Mine has an Emergency Preparedness and Response Plan in place on site. This plan specifically addresses the following:

- ☞ Procedures applicable to all surface areas;
- ☞ Procedures applicable to veldt fires;
- ☞ Procedures applicable to underground fires;
- ☞ Damage to a radioactive source;
- ☞ Radioactive source and fires;
- ☞ Major fall of ground accidents;
- ☞ Major power failure;

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- ☞ Tailings Dam collapse;
- ☞ Flooding in the underground workings;
- ☞ Labour unrest;
- ☞ Handling petrochemical spills;
- ☞ Lightning detector warning alarm within the mining area, surface and underground;
- ☞ Safety harness fall rescue plan;
- ☞ Rescue and response capability; and
- ☞ Management of Emergencies.

*1.f.i.1.n Specific Information required by the Competent Authority*

To date no specific information was required by the Competent Authority.

## 2 UNDERTAKING

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The EAP herewith confirms:

- 2.a The correctness of the Information provided in the Reports
- 2.b The inclusion of Comments and Inputs from Stakeholders and I&APs
- 2.c The inclusion of Inputs and Recommendations from the Specialist Reports where relevant
- 2.d That the Information provided by the EAP to I&APs and any Responses by the EAP to Comments and Inputs made by I&AP are correctly reflected herein

\_\_\_\_\_  
*Signature of the Environmental Assessment Practitioner*

EnviroGistics (Pty) Ltd

\_\_\_\_\_  
*Name of company*

\_\_\_\_\_  
*Date*

Undertaking by the client: (to be signed upon final report)

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

\_\_\_\_\_  
Full Names and Surname

\_\_\_\_\_  
Identity Number

\_\_\_\_\_  
Designation

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



## Annexures

*Annexure 1: DMRE Acknowledgment of Receipt and proof of submission*

*Annexure 2: EAP Curriculum Vitae*

*Annexure 3: Specialist Studies*

*Annexure 4: Stakeholder Consultation Documentation*



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## *Annexure 1: DMRE Acknowledgment of Receipt*

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## *Annexure 2: EAP Curriculum Vitae*

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## *Annexure 3: Specialist Studies*

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## *Heritage*

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## *Ecology*



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## *Hydrology*

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## *Annexure 4: Stakeholder Consultation*

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## *Database*

(only provided to Competent Authority)

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***BID***

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## *Advertisement*



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## *Notifications*

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## *Comments Received*

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